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The Caspian Sea Encyclopedia



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Introduction

“The Caspian Sea Encyclopedia” is the second one in the new series of encyclopedias about the seas of the former Soviet Union published by Springer-Verlag. The first volume – “The Aral Sea Encyclopedia” was published by Springer in 2009. The series will be continued by “The Black Sea Encyclopedia” in 2010.

Today the Caspian Sea is known to readers thanks to its oil and gas resources, sturgeon and caviar, significant sea-level variations, socio-economic and political problems.



The Caucasus and Central Asia (http://eurodialogue.org/files/fckeditor_files/Caspian-sea-map2.png)

For more than 250 years the Caspian Sea was shared by two states: Russia (the Soviet Union) and Persia (Iran). After the disintegration of the USSR in 1992, the new independent states of Azerbaijan, Turkmenistan and Kazakhstan have radically changed the political and economic situation in the region. In addition to Russia and Iran, who had determined the situation on the Caspian for a long period, Azerbaijan, Turkmenistan and Kazakhstan are now interested parties, beginning a new stage in the historical development of the Caspian region. This increase in the number of the Caspian legal entities from two to five has given rise to a whole tangle of geopolitical, economic, international legal, ethnic and environmental problems, each of which demands its own approach and settlement mechanism.

Of the Caspian states, Russia is the largest, followed by Kazakhstan (the world's 9th largest country by territory), and the Islamic Republic of Iran (17th in the world). The Azerbaijan Republic is a Transcaucasian state, while Turkmenistan and Kazakhstan are Central Asian states. All of the states have a presidential republic form of government. The territory of the regional states is 21,996,600 km². Development of economic and political relationships among all the countries of the region is very important, which is why after the breakup of the Soviet Union they have had to build a new system of relationships governing movement and employment among them. Four of the countries are members of the Commonwealth of Independent States (CIS), which influences their interaction and cooperation in relation to many issues. These are countries differing in levels of economic development, types of established political regime, the nature of their foreign relations, religious aspects (Christians, Moslem, Buddhists), and the cultural and psychological mentality of their peoples. Five countries of the Caspian region have 4% of the world territory and 4% of the world population. Nearly 3% of the world's gross national product (GNP) is concentrated here. The Caspian Sea region plays a significant role in the world economic system; the world's economics, in general, depends to a great extent on the economic situation and development in this region, and on the active involvement of the region in the world's economic relations.

The significance of the Caspian region is related, to a great extent, to its multiple mineral resources, the reserves of which differ greatly. Most essential are the hydrocarbon resources, represented by major fields with commercial reserves ensuring their profitable extraction. Other mineral deposits are of local significance only and are used mostly for meeting local needs in fuel, building materials, etc. Prospective oil- and gas-bearing provinces here were determined in the early 1960s. But consideration of the global significance of these resources can be controversial. It was noted that hydrocarbon resources of the Caspian are great, but the Caspian is not the Persian Gulf and it cannot claim the role of a complete alternative source for the world oil market. The US Department of Energy reports that the total resources of the Caspian region are estimated at 100–200 billion barrels of oil (which exceeds North American oil resources as a whole) and 7.9 trillion cubic meter of gas. This makes the region the world's third largest for natural gas reserves. The report, prepared by the Organization on Economic Cooperation and Development (OECD), says that the proven oil resources of the Caspian constitute approximately 3% of the world reserves.

The other, and historically most essential, natural resource of the Caspian is its biological resource. The most important of the Caspian's biological resources is its fish stocks: about 123 fish species and subspecies. Their composition has been shaped by the course of the historical evolution of the sea: isolated from other seas and the Atlantic Ocean, it contains species originating both in the north (the Arctic Ocean) and south (the Mediterranean Sea). The Caspian is biologically unique, because together with the rivers that flow into it – first and foremost the Volga – it contains the world genofund of the sturgeon and is the world's only repository of a diversity of species of sturgeon.

One of the most catastrophic aftereffects of the anthropogenic intervention into the Caspian ecosystem is related to the population of sturgeons, which are the most valuable commercial fishes of the Caspian Sea. In the past century, their catches were maximum in the middle 1970s (26,000–27,000 t); this occurred after the legal prohibition of their marine fishery issued in 1960. Catches of sturgeon in the Caspian Sea accounted for up to 90% of the total world catches. However, later, sturgeon abundance catastrophically dropped. First, from the end of the 1980s, a disease (miopathy) developed, which involved the greater part of the sturgeon population. The origin of this disease is still unclear. In addition, after the disintegration of the USSR and the formation of new independent states, a non-controlled fishery has started in the sea. As a result, the commercial resources have multifold decreased as compared to the 1970s.

Sturgeon are valuable for, among other things, their caviar, an expensive delicacy in high demand on the world market. However, diminishing catches in the Caspian have led to a drop in caviar production. In 1989 the Soviet Union produced 1,365.6 t of black caviar and Iran 282 t. By the late 1990s Russia produced only 40 t/year, other new sovereign Caspian states (excluding Turkmenistan) 34.8 t, and Iran about 150 t. Already, even before full-scale production of hydrocarbons in the Caspian Basin has begun, the situation of the sturgeon in the Caspian Sea is catastrophic, so much so that some experts speak in terms of the Caspian losing its fishery significance.

In addition to sturgeons, two sprat species were of significant commercial importance; however, after the mnemiopsis invasion, their catches have sharply dropped. One of the principal problems of the Caspian ecology consists of the necessity of elaboration of efficient measures for protection of the marine environment from negative anthropogenic impacts, first of all, the rehabilitation of the unique sturgeon community.

The threats of the deterioration of the environmental situation in the Caspian region and of the depletion of its natural resources directly depend on the condition of the economy and awareness of the society about the global character and importance of these issues. This threat is especially great because of the excessive development of the fuel-power industries, drawbacks of legal foundations of the nature conservation activities, restricted application of the nature-saving technologies, and low ecological culture, which increases the risk of technogenous catastrophes.

The unsettled delineation of the Caspian Sea and the uncertainty in its legal status are the main obstacles for successfully coping with many issues, including environmental protection and preservation of the biological resources. Here, the key issue should be the provision of national and international environmental safety. This means elaboration of a system of coordinated state and interstate mechanisms, actions, and guarantees based on the compliance, by one and all states, with the common humanitarian principles and norms of the international legislations that are called to guarantee effective solutions or to prevent emergence of environmental problems of interstate and world community dimensions. Rapid settlement of the legal status of the Caspian is necessary for a transition to sustainable development capable of ensuring a balanced solution of the socioeconomic and nature-conservation issues in the interests of the Caspian countries and the whole world community.

As most of the publications on the Caspian Sea was published in Russian with a limited access to foreign readers (see References), we hope that “The Encyclopedia of the Caspian Sea” will help to understand specific Russian, Kazakh, Azerbaijanian, Turkmen, and Iranian terms, terminology, and names of geographical features much better.

The encyclopedia includes a chronology of historical events having relation to the Caspian Sea development and study for recent 300 years – from the time of Peter I to the present.

This publication is intended for wide public – from decision-makers to school pupils, for all those who are interested in the problems of this region, its geography, history, ethnography, economics and ecology. This book is intended for specialists working in various fields of physical oceanography, marine chemistry, pollution studies, and biology. It may also be useful to undergraduate and graduate students of oceanography. The authors hope that this monograph will complement knowledge of the nature of the Caspian Sea, especially the present-day state of this extremely interesting basin. More information on particular issues may be obtained from the reference list.

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- Glantz MH, Zonn IS (eds.) (1997) Scientific, environmental, and political issues in the Circum-Caspian region. Proceedings of the NATO Advanced Research Workshop on The Scientific, Environmental, and Political Issues of the Circum-Caspian Region. Moscow, Russia, 13–16 May 1996.

- Lerche I, Bagirov E (1999) Impact of natural hazards on oil and gas extraction. The South Caspian Basin.
- Ascher W, Mirovitskaya N (eds.) (2000) The Caspian Sea: a quest for environmental security. Proceedings of the NATO Advanced Research Workshop. Venice, Italy, 15–19 March 1999.
- Zaidi MK, Mustafaev I (eds.) (2004) Radiation safety problems in the Caspian region. Proceedings of the NATO ARW on Radiation Safety Problems in the Caspian Region. Baku, Azerbaijan, 11–14 September 2003.
- Dumont HJ, Shiganova TA, Niermann U (eds.) (2004) Aquatic invasions in the black, caspian, and mediterranean seas. NATO Science Series: IV Earth and Environmental Sciences.
- Kostianoy A.G., Kosarev A.N. (Eds.). (2005) The Caspian Sea Environment. The Handbook of Environmental Chemistry. Vol. 5: Water Pollution, Part 5P. Springer-Verlag, Berlin, Heidelberg, New York. 271 pp.
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- Lagutov V (ed.) (2008) Rescue of Sturgeon Species in the Ural River Basin. Proceedings of the NATO ARW on Rescue of Sturgeon Species by means of Transboundary Integrated Water Management of the Ural River Basin Orenburg. Russia 13–16 June, 2007.

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A

Abakku, Abakko Sea – a name of the Caspian Sea used by renowned Venetian traveler Marco Polo.

Abaskun, Abeskun, Abestun – an ancient port not far from the mouth of the Gorgana River. A. played an important role in East-European communications. The history of Abaksun's appearance is unclear. The port was obviously known to Ptolemaeus (Second century) under the name of Socanaa. In Arabian-Persian written records, A. is mentioned as having been founded by Shakh Kavad (late fifth or early sixth centuries) and was a "trading place for all engaged in trade voyages over the Khazar Sea". The port was connected with the most important overland roads Via Gorgan. The ancient information about marches of the Russians to the Caspian Sea are found in the history of Tabaristan, written from 1216 to 1217 by Mukhammad, a son of Al-Khassan. He knew about attacks of the Russians on A. during the reign of Khassan, a son of Zeida (864–884). Persian historian Ibn-Isfendiar wrote that the Russians sailed over the Caspian and called on port A. in 909–910. A. was flooded in 1304, as was mentioned by the Persian writer Nadjati, as a result of the Caspian Sea level rise in the vicinity of present-day Gyumush-tepe ("Silver hill").

Abaskun (Abeskun) Sea – medieval Oriental records often refer to Astrabadsky Bay in the Caspian Sea (Iran) and the Caspian Sea proper in this way. Perhaps for some time this name was official. For instance, Farukhi, a Persian poet at court of Sultan Makhmud Gaznevid, in his ode to the Sultan, wrote: "Your estates – from the banks of the Gang to the Abaskun Sea." The well-known author of the "Gaznevidian" memoirs Abu-el-Fazl Beikhaki and the great Abu Reikhan Biruni called Astrabadsky Bay the A.S. or "the sea of the Gorgana Bay."

Abich William German, German Vilgelmovich (1806–1886) – geologist who, during his lifetime, was given the title, "a father of the Caucasus and Caspian Sea geology." He was born in Berlin, a German by origin. In 1844, A. begins a study of oilfields in the Apsheron Peninsula and is the first to find some regularities

in their formation. He discovered certain genetic relationships between commercial oil reserves and anticlinal structures of the Earth's crust and laid the scientific foundations of geothermal investigations of oilfields. He also developed a theory of secondariness (i.e. of oil migration). Furthermore, A. revealed a genetic relationship between mud volcanism with oil- and gas-bearing capacity in the interior, and he was the first to voice his opinion on the role of tectonic faults in the formation and destruction of oil and gas deposits. He also made the first attempts at chemically classifying effusive rocks and studied saline lakes and mineral sources in the Caucasus. In 1859–1861, A. made two visits to the Caspian Sea area, first to the Baku and then to the Apsheron archipelago. Here he gave a description of Neftyanje Kamni, prepared the first layout of underwater stones in this region, and proposed their links with an underwater ridge connecting the Apsheron Peninsular with the Cheleken Island. In the Baku archipelago, he gave a detailed morphological description of the islands Kurinsky Kamen, Pogorelaya Plita, Bulla, Svinoy and others. A. developed a hypothesis on a mud-volcanic origin of all islands in the Baku archipelago and studied mud volcanoes located in the Circum-Kura lowland. With A., there are connected works on studies of a geological profile of the Apsheron oil- and gas-bearing province. In 1863, he prepared the first geological map of the peninsula at a scale of 1:42,000. In 1878–1887, A. published "Geological Studies of the Caucasian Countries" (vols. 1–3). In 1853, he was elected the Academician, and in 1866, an Honorary Member of the Petersburg Academy of Sciences.



Otto Wilhelm Hermann von Abich (http://kulkul.xahoihoctap.net/kulkuls-birthday.html?view=mediawiki&article=Otto_Wilhelm_Hermann_von_Abich)

Abrasion (*L. abrasio* – scrubbing off) – wearing of banks and coastal parts of the bottom of large water bodies (seas, lakes, reservoirs) by waves and tides. The intensity depends on the wave effect and also on the hardness of rocks, a condition of formations. A. is also observed on coasts of water bodies affected by waves stirred by passing ships. A. may be intensified as a result of reduced solid flow of waterstreams.

Abrasion Terrace – a coastal part of the former surface of the sea bottom shaped by abrasion. A cross-section of A.T. represents a specific convex curve with mild slopes near the coast and great slopes near the foot of the A.T. An ancient A.T. may be dipped (submerged) or uplifted (emerging). Several uplifted terraces form a coastal abrasion terraced plain. The coast of the piedmont Daghestan on the Caspian Sea presents a narrow terraced abrasion-accumulative low-lying coastal plain.

Abu Khamid Al-Garnati (1080 or 1100–1169 or 1170) – an Arabian explorer, his full name was Abu Khamid Mukhammad Ibn Abd ar-Rakhim al-Garnati al-Andalusi. In 1117 or 1118, he left Andalusia and arrived, first, to Alexandria, then to Cairo where he attended lectures of theologians and grammarians and also visited ancient Egyptian sites. He also went to Baghdad and Persia. In 1131, he crossed the Mugan Steppe and Apsheron Peninsula and arrived at Bab-al-Abwab (Derbent). For 2 decades, he lived in the merchant city of Saksin (perhaps a new name of the old Khazar capital, Itil) on the Volga banks, from where he traveled to many other places. From Daghestan over the Khazar (Caspian) Sea, he made his way to the country of Khazars and “reached a big river that was many times bigger than the Tigris; it resembled a sea from which big rivers were flowing out.” This was the Itil (Volga). He states that the Volga begins upstream in Bulgar and flows into the sea, forming 70 arms. In 1135, A.Kh. journeyed up the Volga as far as Bulgar City. In 1150–1159, he traveled through the Russian lands. He went to Kiev, and for 3 years he lived in Hungary. After making a pilgrimage to Mecca, he returned to Baghdad. He wrote the treatises “Clear Description of Some Miracles of Maghreb” and “Present to Minds and Excerpts from Miracles.”

Academic Expeditions of 1768–1774 – five expeditions organized by the Saint-Petersburg Academy of Sciences having a common purpose and plan and a single comprehensive instruction. In official documents of the eighteenth century, they were called “physical expeditions of the Academy of Sciences.” These were independent expeditions and the largest in the history of the Russian geography in the second half of the eighteenth century, and were multi-purpose trips for study of the nature and population of Russia with its specific economy, everyday life, and culture. Out of these five expeditions, two expeditions headed by German natural scientist Samuel Gotlib Gmelin and Riga citizen Iogann Anton Gildenshtedt went to the Astrakhan gubernia (district). Studies were conducted in the Circum-Caspian area, including some Iranian regions. I. Gildenshtedt described the Kuma River and the Western Manych. He was, in fact, the first researcher of the Kuma-Manych depression. S. Gmelin investigated Black Earth and the banks of the Volga River, and studied specific features of the Caspian Sea level fluctuations. He noted that

“the rise and recess of the Caspian Sea level depends on weather and winds, and rivers flowing into the sea equally contribute to these fluctuations.”

Although one more expedition led by Pyotr Simon Pallas was sent to the Orenburg gubernia, on the way back they passed through Astrakhan, Sarpin Lowland, and Yergenı. It was P. Pallas who came to a conclusion that Yergenı was “the ancient bank of the Caspian Sea.” He also found for the first time that the level of the Caspian Sea was lower than the level of the Black Sea by approximately 20 m (by modern data, the difference between the levels of these seas reaches 27 m). At that time, Pallas also made an assumption that some time ago the northern Circum-Caspian steppes were covered with Caspian waters, linked via a strait along the Manych with the Black Sea. Pallas thought that the Caspian Sea level dropped due to the formation of the Bosphorus Strait. This hypothesis, with some reservations, was confirmed by later investigations.

Academicians S. Gmelin and P. Pallas were also the first researchers of the fauna of the Caspian.

Ada Kosa – located in the south of the Mangyshlak Peninsula opposite the Tokmak cape on the Kazakh coast of the Caspian Sea. Closes the Kenderli Bay.

Adji-Darya (Kazakh – “bitter sea”) – Kazakh name for Kara-Bogaz-Gol.

Adji Lake – located in the Kayakentsky Region of the Daghestan Republic 14 km from the Caspian Sea and 3 km from a railway. Its maximum depth is 1.0–1.5 m, and its area is 5.2 km². Heavy salinity limits vegetation development. In summer, it dries out nearly completely and becomes a solonchak. It is a remnant of a lagoon separated from the Caspian Sea resulting from sea level drop.

Adjibai Spawning Grounds – the only complex of artificial spawning areas of the Atek populations of sea roach and common carp on the Caspian Sea coast. Located in the Atek River zone in Turkmenistan.

Ag-Deniz – Tatar name of the Caspian Sea (translated as “White Sea”) in the eighteenth to nineteenth centuries.

Agrakhan Bay – located between the mainland bank, the western bank of the Agrakhan Peninsula, and Chechen Island on the western coast of the Caspian Sea, Republic of Daghestan. It is 37 km long and from 3 to 11 km wide. The area of A.B. is 365 km². The bay is shallow: the greatest depth is 3–3.6 m only at the entrance into it. The southern part of A.B. stays dry for long periods, being inundated only at storm surge. The unique feature of A.B. is tendency for sharp level drops when southwestern surge winds blow. Prevailing currents are up to 15 cm/s. Northern winds push ice into A.B. The Bay receives waters of the Terek River, the delta of which covers nearly its whole western bank.

Agrakhan Cossack Host – established in 1722 by Tersky Cossacks after moving over the boundary of the Sulak River. It settled near the Sacred Cross fortress where a canal branched off from the Sulak R. going to the Agrakhan Bay and

into the Caspian Sea. Cossacks guarded the coastal area and communication routes on the sea. In 1724, one thousand Don Cossacks came to live here. After signing the Gyandj Treaty in 1735 with Persia, the border was moved to the Terek R. (the fortress of the Sacred Cross was abandoned) and A.C.H. was moved to a new fortress, Kizlyar. Here, the former Tersky Cossacks formed the Tersky-Kizlyar Cossack Host, while the former Don Cossacks formed the Tersky-Semeinoe Cossack Host. Both hosts survived until 1832 when they were united with the Grebensky Cossacks, forming the Caucasian Linear Cossack Army.

Agrakhan Herring (*Alosa Brashnikovi agrachanica*) – a large herring that spends winter in the Southern Caspian and migrates to spawn in the western part of the Northern Caspian. Spawning is in May–June in the southwestern part of the Northern Caspian at a depth of 2–4 (6) m at a water temperature of 20–22°C and salinity level from 1 to 5‰.

Agrakhan Peninsula – a low (up to 20 m) sandy peninsula on the western coast of the Caspian Sea in the Republic of Dagestan, Russia. Its length is approximately 50 km and it has a width up to 6 km. The area of the A.P. is 212 km², it confines from the east the Agrakhan Bay into which the Terek River flows. The western bank of the Agrakhan Bay was first formed as a coastal or island embankment that later turned into the Agrakhan Bar. The vegetation is semi-desert, consisting of wormwood, spurge, and sea reeds that grow on solonchaks. Dune tops are covered with tamarisk.

Agrakhan Shad (*Alosa sphaerocephald*) – endemic shad. Its length is no more than 25 cm, and it averages 16–18 cm. It spends winter in the Southern Caspian and for spawning it runs to the Northern Caspian. It lays eggs at a depth of 1–6 m at a water temperature of 18–20°C and a salinity of 8–9‰.

Agreement Between the Republic of Kazakhstan and the Azerbaijan Republic on the Delineation of the Caspian Seabed Between the Republic of Kazakhstan and Azerbaijan Republic – signed by the presidents of the Republic of Kazakhstan N. Nazarbaev and of the Azerbaijan Republic G. Aliev in Moscow on November 18, 2001. The parties agreed that “the Caspian Seabed and its subsoil shall be delineated between the Parties along the median line plotted equidistant from the initial baseline points on the shoreline and the islands. The coordinates of the initial baseline points shall be determined proceeding from the mean long-term Caspian Sea level equal to the mark minus 28 m of the Baltic Height System.” Geographical description of the medial line and its coordinates shall be determined on the strength of the agreement of the parties mapping materials and initial baseline points and shall be recorded in a separate Protocol that will be a supplement to this Agreement and will be its integral part. The Parties shall, within their seabed sectors, exercise their sovereign rights for the purposes of Caspian seabed and subsoil resources exploration and management, laying subsea cables and pipelines over the Caspian seabed, construction of man-made islands, berms, dams, ramps, platforms, and other engineering structures as well as conducting other legally valid economic activity on

the seabed. The matters of exploration and development of promising structures and fields in case of the median line passing through them will constitute the subject of separate agreements between the Parties.

Agreement Between the Russian Federation and the Azerbaijan Republic on the Delineation of Contiguous Areas of the Caspian Seabed – signed by the RF President V. Putin and Azerbaijan Republic President G. Aliev on September 23, 2002 in Moscow. The Agreement was a logical sequel to the Joint Agreement of the Russian Federation and the Azerbaijan Republic on the principles of cooperation in the Caspian Sea signed by the presidents on January 9, 2001. The Agreement stipulates that the Caspian seabed and its subsoil are delineated between the parties on the basis of the method of median line drawn through equidistant points and modified by arrangement between the Parties as well as on the basis of the generally-recognized principles of international law and the existing practice on the Caspian. Established are geographical coordinates of the delineation line passing through the contiguous areas of the Caspian Sea between the RF and Azerbaijan Republic to exercise sovereign rights in respect of mineral resources and other legally valid economic activity associated with the use of subsoil on the seabed. The initial point of the aforesaid line of delineation of the contiguous areas of the Caspian seabed is the point situated at the site where the RF and Azerbaijan state frontiers come to the Caspian Sea water's edge at the coordinates 41°50'5 N and 48°35'6 E that are determined by the topographic map scale 1:200,000 (sheet K-39-XIX) of 1979 issue. The terminal point of the line of delineation is the point with coordinates 42°33'6 N and 49°53'3 E. The said point may be taken as the point of junction of the lines of Caspian seabed delineation between the RF, the Azerbaijan Republic, and the Republic of Kazakhstan, which will be recorded in trilateral agreement between them. The delineation line is plotted on the scheme of delineation of contiguous areas of the Caspian seabed agreed between the parties. The Parties shall exercise their sovereign rights in respect of mineral resources and other legally valid economic activity associated with the use of subsoil within their seabed sectors up to the delineation line. Mineral resources of the structures crossed by the delineation line shall be developed on the basis of the international practice used in the development of transboundary fields, with authorized organizations appointed by the Government of the Parties. The Governments of the RF and the Azerbaijan Republic shall delegate to their authorized organizations rights for the development of mineral resources crossed by the delineation line determined by the Agreement within their seabed sectors/zones up to the said line of delineation. The authorized organizations of the parties shall, on the basis of the internationally-recognized practice of transboundary fields development subject to the consent of the Parties' Governments, sign appropriate agreements on cooperation.

Agreement Between the Russian Federation and the Republic of Kazakhstan on Delineation of the Caspian Seabed for Exercising Sovereign Rihts to Subsoil Use – signed on July 6, 1998. Pursuant to Article 1 of the Agreement, “The seabed and subsoil of the northern part of the Caspian Sea shall, while the water area

remains in common use, including provisions of freedom of navigation, agreed norms of fishing and environmental protection, be delineated between the Parties along the median line modified on the basis of the principle of justice and arrangement between the Parties. The modified median line shall be based on equidistance from the agreed base lines and shall be determined with due regard to the islands geological structures as well as other special circumstances and geological expenses incurred. Passage of the modified median line shall be determined by counting from the points on the shores of the Parties including the islands based on the Caspian Sea level as at January 1, 1998, equal to the mark of minus 27 m of the Baltic Height System (relative to the Kronshtadt gauge).”

On May 13, 2002, the presidents signed the Protocol to the aforesaid Agreement which establishes geographical coordinates of the Russia–Kazakhstan sea frontier in the northern part of the Caspian Sea. According to the Protocol, oil structure “Kurmangazy” (Kulalin) is under the jurisdiction of Kazakhstan, while the structure “Khvalynskoe” and the field “Khvalynskoe” fall under the jurisdiction of Russia. Both structures will be developed simultaneously.

Agreement Between the Russian Federation, the Azerbaijan Republic, and the Republic of Kazakhstan on the Point of Junction of the Delineation Lines of the Contiguous Areas of the Caspian Seabed – signed in Alma–Ata on May 14, 2003. The agreement determines the position of the point of junction of the delineation lines of the contiguous areas of the Caspian seabed with geographical coordinates 42°33'6 N and 49°53'3 E.

Agricultural Afforestation – a complex of planned establishment of forests to improve soil, hydrochemical, and climatic conditions of terrain, making it more favorable for further agriculture development. A.A. is a part of a wider system of phytoreclamation measures. It includes creation of field protection shelterbelts and afforestation of gullies, steep slopes, and sands. For the Caspian region, it is of special significance in view of progressing desertification and natural environment conservation.

Agricultural Forestry – a multipurpose approach to land use that includes growing perennial plantings (trees, shrubs, palms, bamboo, etc.) together with annual agricultural crops and cattle grazing. Thus, a single complex is formed with a certain spatial organization or with a temporary sequence of land use. The purpose of A.F. is improvement and maintenance of a certain level of land productivity and also diversification of agricultural production.

Aguly (self-name – agul) – an ethnic group in the Russian Federation numbering 17.7 thou aboriginal to Daghestan in the basin of the Chirikh-chai (13.8 thou). Language – agulsky of the nakhsko-daghestansky group of the North-Caucasian Family of languages. Dialects: tpigsky, kerensky, kashonsky, burkikhansky, fistinsky. Religion – Sunni Moslem.

Ailag (Ailagy) – a gulf, or sometimes a bay, in the Turkmen coast of the Caspian Sea.

Akchagyl Layer, Akchagyl (from the name of Akchagyl stow on the Krasnovodsk peninsula in Turkmenistan) – the lowest division of the Upper Pliocene in the Caspian basin. Corresponds in time to the existence of the Akchagyl basin. On the territory of the Circum-Caspian lowland, clays prevail in the Akchagyl deposits. Their thickness in the Northern-Caspian depression varies from 100 to 350 m. A.L. was identified for the first time in 1902 by Academician N.I. Andrusov.

Akchagyl Relicts – the basis of the Caspian Sea fauna, they comprise more than 900 forms. They live in water with salinity of 14‰, multiply at a temperature of no more than 18°C, and avoid waters heated to more than 24°C. Their ancestors appeared in the Akchagyl basin approximately 3.4 million years ago at the ingression of cold sea waters with a salinity of 35‰ via the Kuma-Manych Depression. This event is marked by stenohalinic sea plankton foraminifers and zonal varieties of nannoplankton. Among A.R., conservative boreal and Arctic and adaptive Akchagyl relicts are distinguishable.

Arctic relicts of the Akchagyl time belong to genus that spread in the Arctic Ocean. They multiply only at a temperature lower than 10°C, except for Caspian seals. They include bristle worm, crayfish (*p. Mysis*, several species of sand hoppers, and isopoda crayfish), marine cockroach, and *Nannoniscus caspius Sars*. All other species of *p. Nannoniscus* live in the World Ocean with salinity of no less than 34.4‰ and a temperature no higher than 50°C. A fossil of the Arctic marine cockroach *Saduria cf. sibirica* of about 9.5 cm long was found in 1964 in the vicinity of the Inder Lake together with fossils of Akchagyl.

Boreal relicts of the Akchagyl time belong to genus spreading in the Northern Atlantic Ocean and Barents Sea. They multiply only at a temperature lower than 18°C. They include all Caspian Bryozoa, Coelenterata, and bristle worm.

Adaptive relicts of the Akchagyl time belong to the endemic genus and are the basis of the Caspian fauna of crayfish, mollusks, bristle worm, and saline-water fish (herring, bullhead, and marine pike perch). They multiply at a temperature of 10–18°C. A considerable number of the organisms in this group only grow in the wintertime, which is reflected not only in changes of their biomass but also in the isotopic composition of their shells. Adaptive relicts evolved from extinct stenohalinic and cold-water Akchagyl intruders adapted to greater water salinity and higher temperature. For example, the ancestor of the Ponto-Caspian parasite leeches *caspiobdella* live in highly-saline waters of the Northern Atlantic. In 1995, a predecessor of the freely living leech Esmont was found only in the Laptev Sea. Several species of salt-water adaptive relicts, such as mollusks (Bugskaya zebra mussels, bristle worm *Hypaniola antique* and *Fadeev caspiobdella* leech) also habitate in the Aral Sea and in the delta systems of the Black and Azov Seas. Along the Volga-Don Canal, several fresh-water Akchagal adaptive relicts have intruded into the Volga River.

Akchagyl Sea, Basin – the greatest basin of the Pliocene period, it included the Caspian Sea area which, via the Manych Strait, was connected with the Black Sea and deeply cut into the Volga and Ural interfluvium at a level 100–150 m higher than the present one. It also covered the Aral Sea. It was a deep-water, saline, and cold sea, fauna from which intruded from the Caspian into the Black Sea.

Akhan, Okhan – an ancient large-mesh net for catching “red fish” in the Northern Caspian. A. consists of two layers, one with smaller-size mesh (4.5 cm), and the other with larger-size mesh (20–22 cm). Fish, having passed through larger-size mesh, reach the smaller-size mesh and become tangled in them.

Akhan Fishing, Fishery – a kind of fishing very popular on the Volga and Ural Rivers in the second half of the nineteenth century. The technique was to stake akhans, nets with large mesh made of thick hemp fiber, which had been lowered under the ice. A.F. lasted from late December through March. Cossacks crossed the ice cover for 30–50 km from the bank trying to put nets near ice edges where catches are most abundant. As a result, a great number of young sturgeons were caught. In 1895, such fishing was prohibited on the Ural River.

Akhmaz – (1) (Azeri – “drainless”) – a lake, meander lake, or old bed separated from a river during floods after the clogging by sediments of separate meanders in its bed. Usually, these are long and narrow water bodies of a horseshoe or loop-like form. Many such meanders are no more than 250 m long, and they are located close to the river itself. They are found in the lower reaches of the Kura River; (2) well expressed closed depressions with steep slopes, sometimes with lakes on the bottom; a pond, meander lake, or remnant of silted bed of the Kura and Araks Rivers (Azerbaijan).

Akhtuba – left arm of the Volga in the Volgograd and Astrakhan Regions, separating 21 km upstream of Volgograd. Its length is approximately 537 km. The old inlet into A. is dammed. A new canal 6.5 km long is dug from the Volga downstream.

Akhtubinsk – a city and regional center in the Astrakhan Region, RF. It is located 292 km north of Astrakhan in the Circum-Caspian Lowland on the left bank of the Akhtuba R. Its population is 50 thou (2000). Founded in the first half of the nineteenth century for settlers and called Vladimirovka, it became a city in 1959 as a result of combining 3 settlements: Vladimirovka, the workmen settlement Petropavlovka, and the near-station settlement Akhtuba (a name given by location on the bank of the Akhtuba River). It contains the railway stations Vladimirovka and Akhtuba on the Volgograd–Astrakhan line. Automobile roads from Moscow to Astrakhan (on the right bank of the Volga) and from Volgograd to Astrakhan (on the left bank of the Volga) pass through A. Shipbuilding, ship repair, brick making, canning, milk plants, meat packing works, a bread-making plant are the industries here. A. is a haulage point for “Bassol” enterprises, which extracts salt from Baskunchak Lake. A memorial complex to aviation and deceased test pilots is also here.

Akkol (Kumyk. – “White lake”) – a lake in Daghestan located in the southeastern part of Makhachkala near the Reduktorny settlement, 1 km from the shore of the Caspian Sea. Its length and width are 1.3 km, with a total area of approximately 1.3 km². As a result of sea level drawdown, water stopped flowing into it and the lake dried out. It was revived after the opening of the October Revolution Canal (COR), from which water was drawn to fill it again. It is used for common carp farming.

Aksaraisky – an urban settlement located 80 km north of Astrakhan on the right bank of the Akhtuba River (a branch of the Volga) in the Russian Federation. It was created in the course of construction and operation of the first stage of the Astrakhan gas processing plant.

Aksaraisky Gas Condensate Field – see *Astrakhan Gas-Condensate Field*

Aktam – an ancient name of the Uzboi River bed said to flow into the Caspian Sea. On the map made by A. Bekovich-Cherkassky in 1715 the river bed was shown with an inscription “Former mouth of Darya river “Aktam.”

Aktash – a small river in the piedmonts of Daghestan (156 km long). In summer it does not reach the Caspian Sea because water is withdrawn for irrigation purposes. Its watershed area is 3,390 km², and its slope is 14%. Its width in the upper reaches is 1.5 m, while in the lower reaches it is up to 160 m. The largest tributaries are Cyrkikal, Salasu, Yaryku, and Aksai. The river is recharged by both rain waters and ground waters.

Aktash Lakes – a chain of through-flow lakes and marshes located along the Aktash River, stretching for 55 km and from 1.5 to 8.0 km wide in the Republic of Daghestan. The area covered with water in abundant years is up to 8,500 ha with a depth of up to 1.5 m. A.L. are linked with the Caspian Sea via Agrakhan Bay.

Aktau – Northern and Southern (Turk *ak* – “white”, *tau* – “mountain”) – mountain ridge approximately 250–300 m high on the Mangyshlak Peninsula, Republic of Kazakhstan.

Aktau – name of the city of Shevchenko until 1964, at the center of the Mangistau Region (the Republic of Kazakhstan). Population: 152.9 thou. Formerly A. was called the town of Guriev–20, which was connected with the rich uranium deposit located in the well-known Karagie depression. Founded in 1963 when oil and gas fields were discovered and given the name A. In 1964, it was renamed in honor of Ukrainian poet T.G. Shevchenko (1814–1861) who, from 1850 to 1857, was exiled to fort Novopetrovskoye (later named Fort-Shevchenko) approximately 100 km to the north-west. In 1991, its original name was returned. It is a fishery base. Near A. there is a large oil and gas field. City is linked via railway with Makat station. There is an international airport. Mangistau Nuclear Power Plant was the world’s first industrial-scale fast reactor (BN-350). It was commissioned in 1973. Steam generated by this plant was used in power production and desalting of sea water.

Because of radioactive pollution, however, operations at Mangistau ceased. In 2000, an operation to remove nuclear fuel from the reactor began. Now the reactor is closed.

The water supply of the city is completely dependent on desalinated Caspian Sea waters. A desalinization plant with an output of 40,000 m³ a day is planned. In general, perspectives on the city are connected with the development of hydrocarbons from the Caspian shelf.



Aktau city (<http://anobios.livejournal.com/35592.html>)

Aktau Marine Merchant Port – constructed in 1963 and located 43 km northward of the Peschany Cape on the eastern coast of the Caspian Sea (the Republic of Kazakhstan), it is one of most important intermodal units in the transport infrastructure of Kazakhstan. The port bay forms a deep pocket protected on the west with a breakwater and on the southeast with a stony shoal. In the northern part of the port is an oil loading jetty, and on the eastern coast is an embankment for dry-cargo vessels. The width of a passage into the port is 300 m with a depth of 6 m. The port has land access by railroad, and is also linked with Aktau by an asphalt road. When the program to develop the Mangyshlak Peninsular as the fuel and power base of the northeastern Circum-Caspian area through development of uranium and oilfields on Mangyshlak was started, the small berths of the Aktau was used largely for receiving and shipment of building materials. The development of marine hydrocarbon deposits in the Mangistau Region, however, shaped the direction of the port's utilization. In the mid-1970s, more than 6 million tons of crude oil were shipped from here every year. From 1968 to 2000 the port was rehabilitated at a cost of US\$ 74 million (US\$ 54 million were invested by EBRD and US\$ 20 million by the Kazakh government). The port plays a key role in the export of Tengiz oil and dry cargo from Kazakhstan and is capable of handling 1.5 million tons of dry and 8 million tons of liquid cargo a day. Plans

have been developed to construct a container terminal, an additional grain terminal, a berth for ferroalloy transportation, etc. In 2000, a ferry terminal was commissioned that was the last link in the northern route of the TRASECA alternative. This enabled the opening of new international ferrylines, the Aktau – Nowshahr (Iran), the Aktau – Baku (Azerbaijan), and the Aktau – Olya (Russia). The Aktau – Olya line uses “Ro-Ro” ferries. Approval has been given for the creation of a special economic zone “Sea Port Aktau” (SEZ) to attract investments into the socio-economic development of the region, create new workplaces, and provide incentives for business activities. The main direction in SEZ activities is construction of hi-tech productions, transport, and other infrastructures. Ports in Aktau and Bautino have been operated by the Republic State Enterprise “Atyrau Marine Merchant Port (RSE “AMMP”).

Aladja – a port on the western shore of the Turkmen Bay to the north of the Aladja cape on the eastern end of the Dervish Peninsula in Turkmenia. It is a point of registry of the Turkmenbashi port. Passage into the port, which contains oil-loading and dry-cargo berths, is via a channel.

Albania, Albanian State, Caucasian Albania, Alvania – in ancient times, the Transcaucasian area along the banks of the Kiros River (at present Kura) covering the territory of present-day Azerbaijan. Ancient Greek authors called it Ariania, while Arabs called it Arran. The capital is Berdaa or “Caucasian Baghdad.” Via the Albanian Gates in the eastern part of the Caucasus, A. had communication with territories lying to the north of the Caucasus. V.V. Bartold wrote that “we have precarious and contradictory knowledge” about A., which lies near the Caspian Sea. He also mentioned that in 331 in the battle at Gavgamel when Persian troops were defeated by the Macedonians, an Albanian unit was among the warriors of the Median satrap. The Albanians were also mentioned as the people populating A., an area on the shore of the Caspian Sea that included Baku. It is assumed that Albanians are of the same origin as the Georgians and Caucasian highlanders who belong to the peoples called Japhetides.

Albanian Gates – see *Caspian Gates*

Albanian Sea – Pliny the Elder (First century C.E.) noted that “littoral people give many different names” to the Caspian Sea. “Further along the coast the Albanians . . . call their part of the sea the Albanian Sea.”

Aleshrud – a river flowing into the southeastern part of the Caspian Sea, near the western margins of the city of Makhmudabad in Mazandaran Province, Iran. For 300 m before reaching the sea, the river flows between dunes running parallel to the shore. The river’s width before its mouth is approximately 30 m, while in the mouth is no more than 10 m across.

Alexander Bekovich-Cherkassky Bay – formerly Alexanderbay. In 1959, by Resolution of the Presidium of the USSR Geographical Society, it was given the name A.B.C.; its former name was restored after 1991.

Alexander Wall, Alexander Rampart (Persian – *Sadd-e-Eskandar*, Turkmenian – *Kyzylalan*) – ruins of the historical wall located 30 km northward of the Gorgan mountain in the Holestan province of Iran. The wall stretches westwards of the Gombede-Kabus, and reaches within 5 km of the Caspian Sea, not far from the border with Turkmenistan (special permission is required to visit). It was supposedly built in the sixth century, which is why it cannot belong to the time of Alexander of Macedon. It served as protection from invasions of barbarians from the north.

Alexanderbay Bay – called Alexander Bekovich-Cherkassky Bay in the Soviet period, it is located between the Peschanyi and Zhilandy (Gilyandy) capes in the southwest of the Mangyshlak Peninsula in the Republic of Kazakhstan. To the west, A. is not protected from the winds, but its eastern section is partially sheltered by the Sarzhinsky ridge. Its shores are flat, mostly sandy, and low-lying, with some low hillocks. Along the shore there are shoals, small islands, and both visible and underwater stones. Ranges of high reddish dunes gradually turn into sandy mounds as they run further from the coast. Near the top of A., 4.5 km northward of the Zhilandy cape, the port of Kuryk (Yeralievo, Yeraly) is located.

Aligul – an extinct volcano located in the central part of the Chokhran plateau on the Cheleken Peninsula in Turkmenistan. It is a geological monument of nature.

Alikazgan – the name of the lower reaches of the Novyi Terek delta in Daghestan. In 1914, as a result of a catastrophic flood, the main Terek River bed was breached near Kargalinskaya village, and since that time the source of the Novyi Terek is marked as the beginning of an active delta.

Alluvial Soils (synonym “floodplain”) – a grouping of soils that develop in river floodplains and deltas and which are periodically flooded during inundations, depositing on the alluvial plain. A.S. are very diverse by their morphological structure, texture, chemical composition, and water-air ratio. Types and subtypes differ by varying manifestations of such processes as sod gleyization, peat formation, and alluvium buildup. A.S. are divided into such types as alluvial-soddy, alluvial, alluvial-meadow, sod-gleyey, and alluvial-bog.

Alluvium – alluvial deposits (from Latin *alluvio* – “sediment, wash-on”) – deposits of permanent and intermittent water streams (rivers, springs) consisting of rolled and sorted debris material (pebble, gravel, sand, loam, and clay). A. of rivers running over flat terrain is divided into riverbed, floodplain and meander-lake. In mountain rivers, riverbed and pebble A. prevails. A. makes up floodplains and river terraces.

Amir Abad – a city on the southeastern coast of the Caspian Sea, located 10 km from the coast in the Mazandaran Province in Iran. It is connected via a railroad with the main railway line, the Tehran – Gorgan.

Amir Kolaie, Natural Preserve – located in the central part of the Caspian coastal zone in Gilan Province, Iran, eastwards of the city of Lengerud. The nature preserve area is 1,230 ha. It is represented by a complex of fresh-water lakes, marshes, and small and large ponds. Migratory birds spend winter within the territory covered by this natural preserve.

Amol – one of the most ancient cities of Northern Iran, in the Mazandaran Province. Located on the shore of the Kheraz River, 17 km southeast of the Caspian Sea, it was an administrative center that was connected via highways with such cities as Babolser, Tehran, and Makhmudabad. In the ninth century, Amol replaced Sari as the capital of Moslem Tabaristan.

“Amu-Darya” – An Iranian journal published since 1994 in English and consisting of 2 issues a year. Beginning in 1999 it was published quarterly by the Center for Studies of Central Asia and Caucasus (at the Foreign Ministry of the Islamic Republic of Iran) in Russian and English. It carries articles on issues pertaining to the politics, economics, culture, history, geography, sociology, ethnography, and linguistics of Iran and countries of Central Asia and the Caucasus.

Amudarya (from *Amu* – the name of city Amul (Amue, Amu, former Chardjou) on this river, Persian – *Darya* – a great full-flow river; Ancient Greek *Oxus*, Latin *Oxus* – *Oks* or *Oksu*, Arabic *Djeikhun*) – a river in Central Asia that is mentioned in the “History of the Northern courts” (Sixth century) and in later papers called “Uhu,” or in ancient Persian, “Veh-rud.” In the fourteenth to fifteenth centuries, the name Amudarya was used locally. A. flows over the territory of Tajikistan, Turkmenistan, and Uzbekistan. It originates in Afghanistan from the Vrevsky glacier at an altitude of 4,900 m under the name Vakhadjir, then it flows as Vakhandarya until its confluence with the Pamir River, where it is called Pyandj. Downstream, at its confluence with the Vakhsh River, it gets the name Amudarya. It flows into the Aral Sea. Its length, by different estimates, varies from 2,540 to 2,620 km. Its watershed area is approximately 465,000 km², out of which only its mountain part (217,000 km²) generates flow. The main tributaries are in the mountainous part of the basin: Gunt, Bartang, Yazgulem, Vanch, Kyzylsu, Kafernigan, Surkhandarya, and Kunduzdarya. Downstream of the Surkhandarya, it goes out on the Turan Lowland, and as far as its mouth (1,200 km), does not receive any tributaries. In the lower reaches, it forms a delta with an area of approximately 10,000 km². The average natural flow of A. is about 78 km³ a year, all of which is completely regulated. Water is largely withdrawn for irrigation purposes, which is the main cause of the drying out of the Aral Sea, the level of which had dropped from 53 m in 1960 to 29.2 m in 2008.

A., in the basin of which were located such ancient states of Central Asia as Khorezm (in the river mouth), Sogdiana and Bactria (in its middle and upper reaches), has been known since ancient times. In the Neogene Era, a powerful river,

a predecessor of A. (Pra-Amudarya), flowed over the central part of the Karakum Desert to the west to the Caspian Sea. About 70 thousand years ago, it turned to the north and, having cut through a deep gorge nearby Tyuya-Muyun, reached the Khorezm Depression where a vast lake was formed. Great quantities of sediments gradually filled the lake, turning it into a flat plain. Approximately 10 thousand years ago, A. turned to the west and reached the Sarykamysch Depression, turning it into a lake. The fresh waters that filled the Sarykamysch partially flowed from it along Uzboi to the Caspian Sea. A sediment finally accumulated in the river delta, impeding its flow into Sarykamysch. About 4 thousand years ago or, by other sources, about 10 thousand years ago, A. again turned to the north and found its way into the huge Aral Depression that, as a result, formed the Aral Sea. As L. Gumilev noted, the first investigations in the Caspian Sea area were conducted by brothers-in-arms of Alexander of Macedon, the historian Aristobul and seaman Patrocle. They found that the Caspian level at that time was very low despite the fact that A. waters flowed into the Caspian Sea along the Uzboi. This was evident because at A.'s inflow into the Caspian waterfalls were formed, demonstrating that the absolute altitude of the sea was much lower than it is today.

Arab geographers of the Common Era Ibn-Khordebekh (approximately 847), Ibn-Rust (between 903 and 913), Masudi (died in 956), Istakhri (approximately 951), and Ibn-Khaukal (976) all confirmed that A., or Djeikhuna, flowed into the Aral Sea.

Amudarya-Caspian Route – a project designed to divert part of the Amudarya River into its former bed that flowed to the Caspian Sea in order to form a continuous waterway from the borders of Afghanistan over the Amudarya, Caspian Sea, Volga, and Mariinsky system to St. Petersburg and the Baltic Sea. Creation of such route was the major task of the large expedition headed by General A.I. Glukhovsky (1879–1883). This expedition prepared several projects on passage of the Amudarya waters to the Caspian Sea, both via the Sarykamysch depression and bypassing it, but at that time such projects were quite unrealistic.

Anadromous Fish – an ecological group of fish that migrate from saltwater seas to freshwater rivers to spawn. They feed in near-mouth areas of the seas.

Anchorage – a moorage place for a ship at some distance from the navigable channel that has no obstacles, even and slow currents, and sufficient depth. Such places are usually in the middle part of a convex shore in the deep pool area and the places specially that are reserved on the roads.

Anchovy Sprat (*Clupeonella engrauliformis*) – one of the species of small herring belonging to the genus of common kilka or Caspian sprat. Pelagic fish living in the Middle and Southern Caspian and even moving into the southern part of the Northern Caspian. It is not found in waters with salinity of less than 8‰. Populates open sea areas, avoiding depths less than 10 m. A.S. lives up to 8 years and grows quickly. It reaches maturity at the age of 2–3 years. Its body is cylindrical and thin,

with a rounded belly and a keel that is only slightly visible. The upper part of the body is dark-blue with a greenish or olive tint. Its length is up to 13 cm, though a normal length is up to 8.6–9.0 cm. Average weight is 11 g. It has 44–48 vertebrae. In winter, A.S. is found mainly in the Southern Caspian at a depth of 50–750 m. In spring and summer, it moves to the north and amasses in great quantities in the Middle Caspian, keeping close to a thermocline zone at a depth of 15–60 m. It usually lays eggs in August–October in the open sea, mostly at a depth of 40–200 m and a water temperature of 13–24°C with a salinity from 8 to 12‰. It makes daily vertical migrations, rising at night to the surface, going deeper in the daytime. The fat content of the A.S. does not exceed 6.4%. It is the main feed for predatory fish of the Caspian.

Andiiskoye Koisu – a large tributary of the Sulak River in the Republic of Dagestan. It originates in Georgia from two small rivers, the Perikitel'skaya and the Tushinskaya Alazan. The distance from the point of their confluence to the Sulak R. is 144 km, and its watershed area is 4,810 km² with an average slope of 13%. It receives 874 tributaries, out of which 828 have a length of less than 10 km.

Andreyev Shoal – located near the western coast of the Caspian Sea to the northeast of Kamen Ignatia Island. It was discovered in 1947 by A.I. Andreyev who, from 1939, was on service in hydrographical units on the Caspian Sea.

Andriyevsky Shoal – located near the western coast of the Caspian Sea to the northeast of the Shoulyan Cape in the Apsheron archipelago. It was discovered in early 1900 and was given the name of a fisherman who brought hydro-graphers into its area.

Andrusov Nikolai Ivanovich (1861–1924) – Russian geologist and paleontologist; Academician (1914); Member of the Ukrainian Academy of Sciences (1920); Professor of the Yuriev (since 1896) and Kiev (since 1905) Universities and Higher Women Courses in Petersburg (since 1912); and Member of the Geological Committee (since 1913). Conducted research related to dynamic and regional geology, stratigraphy, paleontology and oceanology. The founder of Russian paleoecology. His stratigraphical and paleontological works are devoted to studies of the Neogene and anthropogenic deposits. In the field of stratigraphy, A. applied both paleontological and paleo-geographical methods which enabled him to identify in the Neogene deposits of the Pontocaspian area the Meotic and Cimmerian stages as well as the Tarkhansky, Chokrasky, Karagansky and Konksky horizons. The stratigraphic scheme of marine deposits developed by him has not lost its significance. Being a participant of oceanographic expeditions to the Black Sea (in 1890) and to the Sea of Marmara (1894), he studied the Kara-Bogaz-Gol Bay (1897). He revealed hydrosulfide “pollution” of deep-water zones of the Black Sea and discovered on its bottom the remnants of the Caspian-typical Post-Tertiary fauna of mollusks. He was Laureate of the Lomonosov Award conferred by the Petersburg Academy of Sciences.



Andrusov N.I. (<http://malacologukraine.narod.ru/gallereya-biosocreal.htm>)

Anthropogenic Desertification – desertification caused by irrational economic activities of humans (overgrazing, destroying of vegetation, development of marginal lands, etc.). A.D. affects the Caspian shores in all littoral states. A vivid example of A.D. is “Black Earths” in the Republic of Kalmykia, Russia.

Anthropogenic Load – a complex of impacts produced by various kinds of economic activities on the natural environment.

Anzali (Enzeli) Bay (before 1980 – Pahalavi) – a vast shallow-water bay on the southwestern coast of the Caspian Sea in the Gilan Province of Iran. A.b. is separated from the sea by a western bar originating from the Dinchala settlement. The bay length reaches 65 km, and its width is about 22 km. It projects into the land for 15 km. The greatest length is about 40 km and its width is up to 3 km. A.b. is divided into 2 parts, eastern and western, and between them a small island is found near the southern coast. The western part is narrow (no more than 1 km wide) and long, while the eastern part is wider. Many small rivers flow from the south into the western part of the bay. The low clay island, Mian-Pushta (Mianposhte), is located at the inlet into the eastern part of the bay. One more island of a similar structure is found to the north. The strait between these islands and the bar is the deepest place in the bay. In the eastern part of the bay is found the Sefidrud River Delta. The arm of Sefidrud, Sparudbar, flowing through Resht City, runs into this part of the bay. To

the east of the Sparudbar Mouth, the bay becomes narrower. To the north is a strait connecting A.b. with the sea. The width of the straight is of 200 m, and near the sea it is obstructed by a wide bar. Port Anzali is located at the inlet into the bay. A fishery is developed here.

A.b. is a habitat for migratory birds as well as the spawning ground for chastik fish, in particular *R. frisii* (Black Sea roach). Salmon and other species of the “red” fish also run here. The water in the bay is practically fresh and only in the strait it is more saline. The strait linking the bay with the sea is called a river by the local population because the flow is directed mostly seaward, which is explained by the inflow of great quantities of water from the rivers flowing into the bay. A.b. is often called Murdab, which means “dead water” because of very calm surface of the water.

Anzali Military Operation – occurred on May 17–18, 1920 during the Civil War. The Soviet Volga-Caspian Navy and the Red Fleet of Soviet Azerbaijan under command of F.F. Raskolnikov as a result of successful military actions returned 23 Soviet ships taken away by foreign invaders and the White Army Guard to the Iranian port of Anzali, and, thus, ensured safe transportation of cargo over the Caspian Sea, making it easier for Soviet troops to complete the final liberation of the Transcaucasia and Turkestan.

Apollo Boris Alexandrovich (1889–1969) – Soviet hydrologist, Doctor of Engineering (1941), Professor (1935), Honorary Member of the USSR Geographical Society (1964). Beginning in 1926, he taught at institutes in Tbilisi and Moscow, and from 1944 was the chair of land hydrology of the geographical faculty of the Moscow State University. From 1919, he took part in investigations of the Caspian Sea and its basin. In 1938–1939, A. headed the Caspian expedition of “Centrmorproject” that studied specific features of ice conditions and physical properties of ice in the offshore areas of the Volga and the Volga-Caspian canal. In the late 1940 s, A. proposed to create “substitutes” of Kara-Bogaz-Gol by using other bays of the Caspian Sea. In the 1950s, under the guidance of A., the Institute of Oceanology of the USSR Academy of Sciences elaborated a scheme of reconstruction of the Caspian Sea on the basis of the project on construction of the North-Caspian reservoir. A. came to very interesting conclusions about the levels of the Caspian Sea for the period beginning from the first century B.C.

His main works are “Volga River Delta” (1928 together with V.V. Valedinsky); “Practical Hydrometry of Solid Flow” (1929 together with M.A. Lukashin); “Hydrological Information and Forecasts” (1945); “Teaching about Rivers” (1951); “Caspian Sea Level Fluctuations” (1956, a co-author); “Caspian Sea and its Basin” (1956); “Problems of the Caspian Sea” (1959, co-author and editor); “Hydrological Forecasts” (1960, co-author).

Apraksin Fedor Matveevich (1661–1728) – Russian general-admiral (1708) and comrade-in-arms of Peter I, he did much in the creation of the Russian fleet. In 1693–1696, he was a *voevoda* (Governor) in Arkhangelsk where he razed the old

shipyard and constructed a new one. After 1700, he took part in ship building on the Azov Sea as the Chief of the Admiralty division responsible for construction, armament, and procurement of the fleet in Russia. After 1707, he participated in establishment of the Baltic fleet, directed many military operations during the Northern War, won many victories over the Swedes, and commanded troops during the siege and capture of Vyborg (1710). From 1711 to 1723, he ruled Estland, Ingermanland, and Karelia, then, from 1714, he successfully commanded the galley fleet at Gangut, which, in July of that same year, won the first major victory on the sea in the history of the Russian fleet. After 1718, A. was the first president of the Admiralty Board, being the chief of the Navy Division of Russia. During the Persian campaign of 1722–1723, he commanded the Caspian fleet and supervised the construction of a port in Astrakhan. From 1723 to 1726, he was the commander of the Baltic fleet, and in 1726, he was the Member of the Higher Secret Council, a supporter of A.D. Menshikov.

Apsheron (formerly Zeinalabdin Tagiev) – a deep-water marine oil and gas field located 85 km from the Azerbaijan coast of the Caspian. Sea depth here is 450–500 m. The area of the oil- and gas-bearing structure is 400 km², and productive horizons occur at a depth of 4,800–7,100 m. The predicted oil reserves are 120 million tons, while gas reserves are 400 billion cubic meter. This field is being developed jointly by SOCAR (Azerbaijan), Chevron (USA) and Total (France).

Apsheron Archipelago – a group of islands and banks near the coast of the Caspian Sea to the east of the Apsheron Peninsula in the Azerbaijan Republic. Among them there are such islands as (as called before 1992) Artyom, Zhiloy, Bolshaya Plita, Lebyazhiy Kamen, Malaya Plita, Zhiloy-Urunos and others. The banks include Severnaya, Lebyazhiya, Karacheva, Andrievskogo, Darwina, Neftyanye Kamni, Filippova, Apsheronskaya, etc.

Apsheron Bay – an artificially created bay appearing after construction of a dam connecting the Apsheron Peninsula with Artyom Island. The length of the bay along a straight line from the dam to the parallel of the northern end of the Artyom Island is 9.1 km, with a width at its northern part of 4.6 km that gradually reduces to 1.4 km to the south. The area of the bay is 24 km².

Apsheron Group of Health Resorts – climatic and spa-mud health resorts and resort areas in the Republic of Azerbaijan located on the Apsheron Peninsula, which protrudes into the sea for 75 km. The surface is flat here (an altitude up to 165 m) with mud volcanoes (as high as up to 310 m) and salty lakes. The Apsheron group includes resorts Bilgyakh, Pirshaga, and Zagulba; climatic resort areas like Sarai, Fatmai, and Nardaran (northern coast of the peninsula); and resorts Buzovna, Shuvelyan and Mardakyan on the northeastern coast with the resort Shikhovo and the resort area Surakhany being on the southern coast. Many resorts and resort areas are a part of Baku; they are connected with each other and with the center of Baku, the distance from which is 10 to 40 km via highways and electrified railway. The

coastal zone near the health resorts has no industry (including oil and gas production complexes). Natural ventilation and abundant vegetation contribute to air purity in the resort area.

The climate here is dry, subtropical. Winter is mild, without frosts; the average temperature in January is 2–3°C. Spring is early and short. Summer is very warm and sunny with an average temperature in July–August of 25°C. Autumn is cool with prevailing cloudy and rainy weather. Annual rainfalls vary from 140 mm in the southwest to 250 mm in the north. Relative humidity is from 60% in summer to 80% in winter, and the number of sunshine hours is 2,800 a year. Quite often, strong northern winds, called “Baku Nord” (Khazri), blow.

The main natural curative factors that intensify the climatic-thalasso therapeutic effect gained from a soft climate, warm sea, and over 100 km of sand beaches (a bathing season from May 15 through September 15) are the sulfide and iodine-bromine mineral waters in Surakhany, Shikhovo, and Bilgyakh and the sulfide silt mud of salty lake Masazyr. Curative mud is applied in the Apsheron health resorts and in other health-improvement establishments of the Republic. Mineral waters from the Apsheron springs are also used in all Apsheron resorts (mostly for baths and for inhalations). The ailments such treatments at the Apsheron resorts are prescribed for are cardiovascular diseases, diseases of respiratory organs (including tuberculosis), functional disorders of the nervous system, ambulatory diseases, peripheral nervous system, and gynecological problems.

Apsheron Layer, Apsheron (named for the Apsheron Peninsula) – the Upper Pliocene layer of the Caspian basin, its existence was proven in 1923 by Andrusov. After revealing glaciation that was dated to the Apsheron Time in the Caucasus, some researchers thought it appropriate to classify A.L. in the Quarternary system. The border of the Neogene and Quarternary systems in the former USSR was traditionally put between A. and Baku layers of the Caspian Region at 0.7–0.8 million years; however, the International Geological Committee long ago decided to date this border as 1.8 million years, which corresponds to the border between Akchagyl and Apsheron of the Caspian Region. This corresponds to the time of the existence of the Apsheron basin. A.L. is characterized by interbedding of thick sandy deposits with clay ones. The thickness of its deposits is 400–600 m.

Apsheron Peninsula (from Persian *ab* – “water” and *shiron* – “sweet, fresh”; or *ab* – “water” and *shoren* – “solonchak”) – named after the small settlement Apsheron that existed till 1720s. In ancient times, it was called “Bab al-Abvab.” At first it was named “Apsheron Cape.” It is at the eastern end of the Caucasus Ridge within the Azerbaijan Republic, and protrudes for 75 km into the Caspian Sea. Its width is up to 30 km. The surface is a rolling plain with some mud volcanoes and mildly sloping closed, drainless depressions in which solonchaks and salty lakes lie. Its altitude is 50–165 m. A.P. is composed of sedimentary Tertiary and Quarternary deposits of considerable thickness, and is one of the oldest oil-bearing

regions in the world. It has mineral water (mostly hydro-sulfuric) springs and salty lakes. The desert climate becomes milder here due to the sea effect, strong northern winds (nord) are nearly constant. The vegetation is of a semi-desert type (feather grass, meadow grass, legumes) growing on chestnut soils. Widely developed are vines and melon crops cultivated under irrigation. On the southern coast of A.P. is located the capital of Azerbaijan, Baku. On the northern slope of A.P. is the city of Sumgait as well as the settlements Shuvelyan, Mardakyan, Buzovna, Pirshaga and others.

Apsheron Region – one of the Circum-Caspian administrative-territorial regions of the Azerbaijan Republic.

Apsheron Sea, Basin – a slightly saline water basin that existed in the location of the modern Caspian Sea during the Late Pleistocene; it was larger than the modern sea, but was smaller than the earlier Akchagyl basin. Losing its connection with the Black Sea, it became shallower and less saline (its salinity was similar to that of the Caspian Sea), but warmer. The fauna of the Black Sea crossed into the Caspian.

Apsheron Sill – a latitudinally oriented underwater ridge dividing the Middle and Southern Caspian with a maximum depth in the axial part of approximately 200 m. It stretches for more than 300 km between the Apsheron and Krasnovodsk Peninsulas, and is of tectonic origin. The southern slope of A.R. dips steeply towards the South-Caspian depression.

Apsheron Strait – a former strait between the eastern coast of the Apsheron Peninsula and the western shore of the Artyom Island. It was very important for shipping, because it significantly cut the distance for vessels. After construction of the dam that connected the Apsheron Peninsula with Artyom Island, the strait turned, in fact, into a bay (the dam's length is approximately 2 km, with a width of 20 m). The water area to the north of the dam is called the Northern Apsheron Bay, while that to the south of the dam is the Southern Apsheron Bay.

Aquaculture – commercial growing, farming of useful organisms in water environment, including mariculture (marine aquaculture), growing of useful algae, mollusks, fish and other organisms living in the sea, brackish lagoons, and river areas. A. in natural and artificial continental water bodies and waterways means mostly fish farming.

Aqusa – a western branch of the Kura River in the Republic of Azerbaijan. In the past, its length was approximately 60 km, and it flowed into the northern part of Kyzylagach Bay in the Caspian Sea, forming several branches. It makes a natural irrigation channel for the southeastern part of the Salyan Steppe. In its lower reaches A. has a branch called Sevryuzhny.

Araks (Persian *Aras* – “a river”) – a right tributary of the Kura River in Armenia, Azerbaijan, and Turkey. It was first mentioned by the ancient Greek geographer Gekatei Miletsky in the fourth century B.C.E. as Araks. In later sources, it was called Araks, Aros, Aras, and Araz. For a long time, Araks was the state border between Iran, Turkey, and Azerbaijan (for 600 km it flows along the border with Turkey and Iran). Originating on the slopes of the Bingel Ridge in Turkey, its length is approximately 1,000 km, with an area of more than 102,000 km². A. is the second largest river by water flow and length in the Transcaucasus, with 357 km of the river in the territory of Turkey. It has mixed recharge: 44% from ground waters, 38% from snow, and 18% from rainfall. According to Herodotus (485–425 B.C.E.), A. flowed incised deeply into the land bay of the Caspian Sea as a ramified delta. During its existence, the river in its lower reaches has changed its riverbed several times. The last time was in 1896, when A., having broken the dam near Saatly City, flowed over the Mugan Steppe, forming several lakes, including *akhmaz* and *mortso*, and the well-known Agchala, Makhmudchala, and others. For many years, these lakes were used for farming the most valuable fish of the Southern Caspian. The flow of A. before its inflow into the Kura makes 285 m³/s or about 9 km³/year.

Arakum Lakes – located in the Terek delta between the Kordonskaya River and the dry river of Old Terek in Daghestan. Due to less severe floods and withdrawals of water for irrigation, the through-flow lakes have gradually dried out. At present, only Yalginsky, the Smaller Drobnoye, and the Greater Drobnoye lakes have survived. In place of many small lakes, the Upper and Lower Arakum Lakes were artificially created to feed from the Terek, which flows through the Zenkinsky and Yalginsky canals. These lakes are of great fishery significance.

Aral-Caspian Region (sometimes Aral-Caspian Land-Locked Flow Area) – one of the largest (4,900 thou km²) regions in Eurasia. The largest drainless area (because flow from its territory does not reach the World Ocean, but all settles into landlocked water bodies) in the world after Northern Africa. It is usually divided into two big parts – the Caspian Sea and the Aral Sea. It has a drainless nature, another important feature is the vivid aridity of the region, caused by its location in a desert/semi-desert zone. The region comprises the following physico-geographical areas: Circum-Caspian lowland, plains and flatlands of Western and Interior Kazakhstan, plateaus Betpak-Dala and Maiynkum, Turan lowland, plateaus Ustyurt and Mangyshlak, offspurs of Paropamiz (lowlands Karabil and Badkhyz) in Northern Afghanistan, Messeriansky plain, Gorgan and South-Caspian lowlands, Lenkoran lowland, Kura-Araks lowland, Terek-Kuma lowland, and Kuma-Manych depression.

Administratively, the Aral-Caspian region completely covers the territory of the Uzbekistan and Turkmenistan Republics, part of the territory of the Russian Federation, the Republics of Kazakhstan, Kyrgyzstan, Tajikistan, Azerbaijan, and a small part of the territory of the Islamic Republic of Iran and the Republic of Afghanistan.

Archipelago – a group of islands located at a small distance from each other and usually perceived as a whole. There are distinguished offshore, coral, and volcanic archipelagoes. In the Caspian are the Apsheron A. and Baku A.

Arctic Species, Caspian Intruders; Arctic Relicts – crossed into the Caspian Sea in the post-glaciation periods of the Holocene and Late Pleistocene (10–100 thousand years ago) via lake-river systems. A.S. include 14 species and subspecies that account for only 1.2% of all Caspian fauna. All marine relicts from the Arctic Ocean propagate in winter and only in fresh water. They are *Manayunika caspia*, out of crayfish – 10 species, two species of fish – sheefish and Caspian sea trout, as well as Caspian seals. Crayfish (71.4%) are the basis of the A.S. fauna. A.S. live at great depths (from 200 to 700 m) in the Middle and Southern Caspian because here the lowest temperature are found (4.9–5.9°C).

Arid Soils – soils are formed in arid regions in dry steppes, semi-deserts, desertified savannahs, and deserts. As evaporation prevails over precipitations, A.S. are characterized by a non-washing water regime. A.S. include chestnut, brown semi-desert; reddish-brown dry savannah soils; different desert; and other types of soils.

Aridity – dryness of climate; insufficiency of rainfall for vegetation development.

Artemiev Nikolai Ivanovich (1835–1896) and Dmitry Ivanovich (unknown) – brothers, self-made ship owners, first inventors of oil tank fleet as well as first industrialists who supported with their own money the “special educational establishment for seamen.” From 1854, they were engaged in transportation of salt, Bukhara cotton, and timber over the Caspian. From 1866, they got into the oil transportation business, delivering oil from Baku to Astrakhan. In 1873, A. were the first to install a tank on the small schooner “Alexander” and filled it with remaining oil. Oil was loaded and unloaded with the help of manual pumps. Then they equipped for oil carriage all their fleet (7 vessels) going to Nizhny Novgorod. In 1878, the brothers for the first time used a steam pump they designed and produced at an Astrakhan plant with a pumping capacity of 4,000 poods (a Russian measure of weight equaling 16.38 kg) of oil an hour. As a result, it became possible to make 14 trips from Baku to Astrakhan during a season. Following the system invented by the brothers A., not only Russian but also the foreign fleet was re-equipped. For their invention, the government awarded the brothers with the Gold Medal, while the Emperor’s Society of Merchant Fleet Promotion gave them a monetary award.

Artyom Island – known until 1917 as Saint-Pirallahi (*Pirallahi adasi* – “God’s Church”), an island in the Caspian Sea located near the eastern shore of the Apsheron Peninsula, 40 km from Baku. It is the greatest of the islands in the Apsheron Archipelago. From 1934 to 1940, a dam was constructed that connected A.I. with the Apsheron Peninsula. The island area is approximately 10 km² and sustains the Artyom-Ostrov Settlement, which is administratively included into Baku with which it is linked by electrified railway and bus. Oil resources are developed

both on the island and in the sea. Jetties run for dozens of kilometers connecting oil and drilling platforms with the southern and northern parts of the island. Its name derives from the revolutionary, Artyom (F.A. Sergeev). Some believe that in the past A.I. was connected with the Apsheron Peninsula. At present, it is again known as Pirallahi.

Aschysor – a Turk name made up of two words: *aschy* – “bitter” and *sor* – “a dried out lake”; once a bay on the eastern coast of the Caspian Sea, at present it is a depression located 1.5 km from A. Bekovich-Cherkassky Bay and 2 km from the Karagie Depression in the Republic of Kazakhstan. Still in the early eighteenth century, A. was linked with the Caspian. In 1715, A. Bekovich-Cherkassky marked it on a map for the first time and called it Oseter Bay. On the map of G.S. Karelin this bay bears the name of Kankrin, the Minister of Finance of Russia; however, this name did not remain in use for long. On the maps of the late nineteenth century, one can see the name Benturli-Ishan, which means “a high church person of Mangyshlak Turkmen.” In 1764, it was linked with the Alexanderbay Bay. In the late nineteenth century it was separated from the Alexanderbay Bay by a sand ridge, thus, turning into the Benturli-Ishan Lake. Then, for a considerable time period, it connected and disconnected following the fluctuations of the Caspian Sea level. At present, A. and the Caspian are linked by a water divide (a sand barrier) 40 m high, 7 km long, and 4–15 km wide.

In the A. relief can be distinguished 2 basins of various sizes dissected from the west–southwest to the east–northeast by a stone ridge. The smaller one is conventionally called Upper A. An inconsiderable quantity of water seeping through the sand barrier into the A. Bekovich-Cherkassky Bay forms small lakes that dry out in summer. Solonchaks are prevalent. Lower A. covers an area of 170 km², and in its southwestern part it lowers to an elevation of –38.5 m. Its bottom saline deposits are similar to the salts of the Kara-Bogaz-Gol.

Well-known geographer S.Yu. Geller (1954) had a project on chemical and power utilization of this depression. This project envisaged replacement of Kara-Bogaz-Gol with a new sulfate base. Water from the sea may be directed quite easily along the natural slope and then via short canals to a steep bank of the Karagie Depression. This makes it possible to construct without any dam an hydroelectric power station capacity of 35,000 kW. It was assumed that the permanent head would be maintained due to evaporation from the Karagie Depression. Creation of concentrated brine in A. may enable manufacture of not only sodium sulfate, but also of other salts dissolved in the Caspian waters.

Ashiki (in the Karakalpakian – “tongue”) – depressions with high occurrence (on 1–3 m depth) of fresh ground waters. Found in the Circum-Caspian Lowland in the area of the Volga-Ural sands. Good haylands composed of Siberian wheatgrass and brome grass.

Ashkhabad, Ashgabad (from Arabian *ashk* – “love” and *abad* – “city”) – a city on the Circum-Kopetdag Plateau on the left bank of the Karakum Canal (River) near the borders of the Karakum Desert at an altitude of 200–255 m. It is the capital of Turkmenistan. A. is built on the site of an ancient settlement. Near the Hotel “Turkmenistan,” archeologists found the remnants of this ancient settlement and a small fortress that was built in the prime of the Parthian Kingdom (third century B.C.E.). In the thirteenth century these settlements were destroyed during the Mongolian invasions. A. was revived in 1881 as a military fortification that received its name from aul Askhabad. From 1882 to 1918, it was the center of the Trans-Caspian Region. Construction of the railways A.–Caspian (1885) and A.–Tashkent facilitated the growth of A. and trade development here. Between 1918 and 1925, A. was the center of the Turkmen Region, and in 1919, it was renamed Poltoratsk in memory of Chairman of the People’s Economy Council of the Turkestan Republic, P.G. Poltoratsky (1888–1918). After formation in 1924 of the Turkmen SSR, the city became capital, and in 1927 it was given the name Ashkhabad. From 1939 to 1959 and from 1973 to 1992, it was the capital of the Turkmen Soviet Republic, and, at the same time, the administrative center of the Ashkhabad Region. From 1992, A. was the capital of Turkmenistan and the administrative center of Akhalsky velajat. In 1992, in Turkmenistan, the Russian pronunciation was changed to “Ashgabat.” The population is 540 thou (1997).

High seismic activity is a result of the specific geological structure of the A. territory. In 1948, A. survived a devastating earthquake even though its structures were destroyed nearly completely because 90% of its houses were made of clay. A. was built anew and this time the buildings were made seismic-proof. At the same time, the problem of water supply was resolved when, on May 12, 1962, waters from the Amudarya River went to A. via the Karakum canal. Average temperature in January is -1°C and in July is $+30.5^{\circ}\text{C}$. The non-frost period lasts for 232 days a year, and the number of bright sunny days is 231. The microclimate of A. is softened to some extent by irrigation and green plantings.

A. is a large economic, political, and cultural center of Turkmenistan and an important transport point. In 1938, the Ashkhabad railway was the first to be converted to diesel locomotive traction, which is very important for desert regions. After becoming independent, a modern airport, one of the largest in Central Asia, was built here. A. has communication lines with all CIS and foreign countries. It is a center of metalworking, building, textile, sewing, food industries, footwear and jersey production, and carpet making.

After independence, A. has changed its appearance considerably. A wonderful complex of governmental buildings, a monument to Neutrality, new living quarters, and a complex of modern hotels, such as Four Points, AK Altyn, Sheraton, Grand Turkmen and others, were built.



Ashkhabad city (http://niyazov.sitecity.ru/album_1907134155.shtml?pix=15)

Ashur-Adeh – an island near an inlet into Gorgan Bay near the Caspian Sea coast of Iran. From the nineteenth century it was used by tsarist Russia. In 1842, a Russian navy station was constructed on the peninsula to prevent raids of Iranian and Turkmen feudal powers and to widen trade relations between Russia and the Turkmen on the southeastern coast of the Caspian and Iran. It was handed over to Iran by the Soviet government under the treaty of February 26, 1921. It has strategic significance. During a Caspian shoaling period (1940–1950), the island was connected with the mainland via a narrow spit.

Aslamka, Oslamka – a sailing one- and two-mast transport and fishing vessel widely used on the Caspian Sea and in the lower reaches of the Volga River. A. is characterized by a great fallout of boards and considerable stem raking towards water. Fishing A. went to sea with 10–30 live-bait fishing boats from which a catch was taken on board. A.'s length is 12–15 m, its width is 2.4–2.7 m, and its draft is 0.6–1.2 m, and it has a carrying capacity of up to 30 t.

Association of Universities of the Caspian States – formed in 1995 to develop a single system of university education taking into account the needs of the socio-economic development of the Caspian states with regard to an environmental situation, fishery development, oil production, and transportation without damaging the natural environment. It was also mandated to rally the efforts of scientists to study and elaborate on methods to improve the Caspian ecosystems. It includes the state universities of the Kazakh Republic (Atyrausky and Aktausky), Turkmenistan (Turkmensky), the Islamic Republic of Iran (Mazandaran, Gilyan, and Gorgan), the Azerbaijan Republic (Azerbaijansky); and the Russian Federation (Daghestansky,

Kalmyksky, and Astrakhansky). The highest body in A. is the assembly. From time to time, A. convenes international workshops.

Astana (translated from the Kazakh language – “capital”), Tselinograd (from 1961 to 1992), Akmola (up to 1998) – the capital of the Kazakh Republic since June 10, 1998. This is the fourth capital of Kazakhstan after Orenburg, Kzyl-Orda, and Alma-Ata. It was renamed into A. in May 1998, “taking into consideration the appeals of local executives and representative bodies, the wishes of the public, and on the basis of conclusions of the state onomastic commission at the Republican Government.” After 1917, it was the regional center, Akmolinsk (until 1961). A. is located in the central part of the country, on the north of ancient Saryarka, which is a sacred land for the Kazakh people on the right bank of the Ishim River. It was founded in 1824, though other sources date its founding at 1832. In the past, it was located on the old caravan path from Central Asia to Western Siberia where different ethnicities and cultures influenced each other. The city was an important merchant center where cattle trade prevailed. In 1863, it was declared a district center. The modern history of the city began with the development of the virgin lands (tselina). In 1960, it became the center of the Tselina Territory. Its population numbers 392 thou (2001), and its area is 22,000 ha. A. is a large center of machine-building, metal-working, food and milling industries. The city has 37 schools, 22 hospitals, and 3 educational institutes (L. Gumilev Eurasian University, the Agricultural University, and the Medical Academy), and governmental establishments. It is the cultural and scientific center of Kazakhstan. The city has the world’s most northern oceanarium and the overview tower “Astana-Baiterek” 97 m high.

Astara (from Azeri – “low place, lowland”, Persian *estera-hat* – “rest”) – since 1945, a city on the shore of the Caspian Sea at the mouth of the Astara River, along which the state border between Azerbaijan and Iran runs. It is a regional center of the Azerbaijan Republic, 3 km from the railway station Astara. Its population is 20 thou. It is a former railway terminal on the state border of the USSR and Iran. A. is the center of one of the major subtropical farming regions (growing of tea, citrus, feijoa), vegetable growing, cattle breeding, and a fishery. It has several factories for agricultural processing and a fish plant.

Astara–Gassan–Kuli Line – unilaterally established in 1934 by order of the USSR Peoples Commissariat for Internal Affairs “On Establishment of the Caspian Sea Regime” as an internal administrative action, but was never recognized by Iran as an official marine border with the USSR on the Caspian Sea. Its length is 423.2 km. At first, this line was used as a demarcation by Soviet aircraft, but from 1953 it also served unilaterally for Soviet fishing vessels in the southern regions of the Caspian Sea.

Astara Iranian – a small town and port at the mouth of the Astarachay River in the Islamic Republic of Iran. In the past, the ancient caravan road from Tavrida to Baku and Shemakha ended here. The Near-Caspian highway connecting this town with all settlements on the coast runs along the shore southwards. From here, the road to Ardebil runs along the state border between Iran and Azerbaijan. In addition,

from this town an automobile road goes to the north to Astara and Lenkoran in Azerbaijan. In the former Soviet Union, rather intensive traffic of Soviet and Iranian goods crossed through A.

Astaracay – a river flowing through a narrow gorge (sometimes called Astarinka) in the far south of the Azerbaijan Republic along which a state border between the Azerbaijan Republic and the Islamic Republic of Iran runs. It originates in the Talysh Mountains and flows into the Caspian Sea.

Astarinsky Region – a region located in the southeastern part of the Azerbaijan Republic on the coast of the Caspian Sea. In the south, it borders Iran, while in the north it borders the Lenkoran Region, also of Azerbaijan. The Caspian coastline here runs for 21 km. The area of the region is 616 km², and the population is 77 thou, of which 17 thou (22%) are urban dwellers and 60 thou (78%) are rural. The region has one city, the regional center of Astara, and 56 villages. The main branches of the economy here are tea and vegetable production, with citrus groves and fisheries as well. Industry here is represented by an asphalt plant and a small tractor fleet. A. is connected with Baku via international railway and a road passing through Lenkoran. A terminal with Iran is also found here.

Astrabad – until 1930, it was called Gorgan City, Iran. A. Was mentioned in the plans of Emperor Pavel I on incursion into India with Napoleon's troops.

Astrabad Bay – see *Gorgan Bay*

Astrabad Herring – see *Whitehead*

Astrabad Spit – see *Miankale*

Astrakhan (“Djutarkhan” from the Turk *Khadjitarkhan* (*Adjyash tarkhan*)) – “Earth given to pilgrim” – administrative center of the Astrakhan Region located in the Circum-Caspian Lowlands of the Volga River in the upper reaches of its delta. A major industrial and cultural center in the south of Russia, a river and sea port, the most important cargo handling point of direct, mixed railway-automobile-water communication, and is a point through which railways (to Saratov, Kizlyar, Kazakhstan) and automobile roads (to Volgograd, Elista, Stavropol, Makhachkala) run. Airlines connect A. with many cities in Russia and near foreign countries.

The territory of A. is cut by arms and branches passing from the Volga bed to the southeast (Bolda, Kutum, Tsarev, Kizan, Kazachiy erik (shallow channel), and Pervomaisky canal). Interestingly, the latter, flowing from the Volga to the city center, was dug in the early eighteenth century following the decree of Peter I, perhaps reminiscent, in the past, when vessels and boats lied in branches and eriks, of Venice. The city is located on 11 islands in the upper part of the Volga delta. Population – 488.3 thou (as of 1996). It is divided into 4 large districts.

A. emerged as a Tatar settlement Ashtarkhan (formerly Adjitarkhan, Khadjitarkhan, Khazitarkhan, Cytrakhan, Zystrakhan, Ash-Tarkhan, Gitarkhan) in the thirteenth century from a Mongol settlement in the Volga lower reaches on the right bank of the Volga located 12 km from modern A. on formerly bustling Persian and

Arabian caravan and waterways that had the permanently formed settlements of Khazars and Polovets along them. In this way, the capital of the Khazar Kaganate, Itil, was founded, which was destroyed by Prince Svyatoslav and replaced by Sarai-Batu, the capital of the Golden Horde, in 965. A. was first mentioned in 1333 by Arab geographer Ibn-Batutoi as settlement Khadjitarkhan, *khadji* (Turk) meaning “pilgrim who was in Mekka” and *tarkhan* meaning “free of feudal obligations.” Together, they mean “pilgrim settlement free of obligations.” In the Russian chronicles, it was called Khazi-Tarkhan. In other versions, a tribe of asy lived on the territory of the present-day Astrakhan Region that was granted a special deed of tarkhan by Khan Batyi who conquered these lands. It entitled local people to free and tax-free trade. The asy tribes were soon called astarkhany (i.e. free asy). And as the legend says in this way the name of A. appeared. An advantageous position quickly turned this settlement into a large merchant city. In 1395, A. was burnt down by Tamerlan troops. It was built anew between 1459 and 1556 and became the capital of the Astrakhan Khanate, joining the Russian state in 1557.

Modern A. was founded in 1558 as a wooden-earth fortress on the high Zayachyi or Dolgyi hill in the upper part of the Volga delta. In 1580, in place of wooden walls under supervision of construction masters Mikhail Veljaminov and Dei Gubasty, the erection of a Kremlin with towers was begun, then a caravan-sarai appeared which attracted many people from other regions. *Slobodas* (peasant villages) were built around the city: Sianova, Bezrodnaya, Terebilovka, Soldatskaya, Yamgurgeevka (or Ogureevo). The Armenians formed the Armenian sloboda, while the Tatars formed the the Tatar sloboda. In this period, A. was called “the sturgeon capital of Eurasia.” On the initiative of P.S. Obolensky-Serebryanyi, the construction of the Russian city A. was started on the left bank of the Volga River.

In the sixteenth to seventeenth centuries and in the eighteenth century, A. was a “window” to Asia for Russia and Europe. In 1605–1606, A. was plundered by the Terek and Don Cossacks, and by the mid-seventeenth century, it became a border fortress near the Volga mouth. After seizure of this fortress by S.T. Razin, for more than a year and a half (1670–1671) A. was ruled by Cossacks. In 1705–1706, due to the increased tax burden, despotism of the ruling powers, and garrison officers, the Astrakhan uprising was raised by *streletz* (soldier in regular army), peasants, and workmen that was cruelly suppressed by tsarist troops. In 1708, A. entered the Kazan Gubernia (Province).

In 1709, a major fire damaged the city severely. After being rebuilt, from 1717, A. became the main city in the Astrakhan Gubernia. From A., Peter I began his Persian campaign of 1722–1723. From 1785 to 1790, A. was a district center of the Caucasian viceregency and from 1790 was the center of the Caucasian Gubernia. From 1796, it again became the center of the Astrakhan Gubernia. In the early eighteenth century, A. created its own Cossack host, the Navy, the Admiralty, shipyard, port, and in the nineteenth century, with the Baku oilfields development, A. became a major oil market (oil storehouses and docks “Nobel Brothers Partnership”). The Astrakhan port became one of the largest in Russia. In 1909, the Ryazan-Ural railway passed through A. During the Civil War, severe battles for seizure of A. were waged, ending with the ultimate defeat of the White Guard troops. Soviet power was established in the city on January 25, 1918.

From 1929 to 1934, A. was a part of the Nizhnevolzhsky Territory, known from 1934 to 1943 as the Stalingrad Region; in 1943, it became the administrative center of the Astrakhan Region. During World War II, A. was the most important transit point for delivery of Baku petroleum products to the acting army.

Poet Velimir Khlebnikov, “the genius of the delta,” whose life was closely connected with this city, called A. “a triangle of Christ, Buddah, and Mohammed.” It was he who made A. renowned in the world literature after publication of his poem “Khadjitarkhan.”

After the 1960s, a globally significant industrial base for development of the Caspian shelf belonging to the USSR was created in A. Today, A. has well-developed light and food (especially fish) industries, as well as machine-building and metal working, woodworking, and cellulose-paper industry. At present, A. has 18 shipbuilding yards.

In the city one can find 4 higher educational institutes (including an Academy of Music), a scientific library, and the Caspian Fishery Research Institute. There are 2 theatres, a philharmonic society, the unified historical-architectural museum-nature preserve (collections of articles on the history of Khazars, Golden Horde, and development of the Lower Povolzhie by the Russians); the house-museum of Velimir Khlebnikov (opened in 1993); and the B.M. Kustodiev Picture Gallery established in 1918. The most interesting historical sites are the Astrakhan Kremlin of 1580–1620 (located on the Astrakhan highest hill; its construction was started during the rule of Ivan the Terrible and ended with Boris Godunov) which contains the Assumption (1698–1710) and Trinity (sixteenth to eighteenth centuries)



Astrakhan city (<http://www.asip.ru/img/ast003.jpg>)

Cathedrals; the Kirill Chapel (seventeenth to nineteenth centuries); the dome tower in the enclosure of the Saviour-Transfiguration Monastery (early eighteenth century); the Demidov Townhouse (seventeenth to eighteenth centuries) and the John Zlatoust house (1763); Saint Vladimir's Cathedral (1895–1904); and the House of the Astrakhan Cossack Host (1906–1907).

Astrakhan Army – formed in June 1918 on the Don by the government of the Astrakhan Cossack host that consisted of Kazakhs and Kalmyks. Later, it was renamed and became the Astrakhan Corps that acted to the east of the Manych River and on the Tsaritsyno direction. On September 30 (October 13), 1918 General P.N. Krasnov included the Corps into the Special Southern Army.

Astrakhan-Caspian Navy Fleet – a detachment of the Soviet Navy (VMF) established in October 1918. It took part in defense of Tsaritsyn and Astrakhan from the White Army. In July, 1919 it was included into the Volga-Caspian Navy Fleet.

Astrakhan Cossack Host – created in 1817 in the Lower Volga (with the center in Astrakhan) of Cossacks who lived here in the mid-sixteenth century for patrolling the shores of the Caspian Sea and banks of the Lower Volga. The origin of A.C.H. dates back to 1737, when a decree on the creation of a military regiment out of baptized Kalmyks and Russians was made public. In 1742, nearly all Kalmyks fled, taking most of the public horses, but the host did not break up. In 1750, it was replenished and received its name. In 1916, A.C.H. numbered approximately 40 thou people and occupied a territory of over 808 thou *desiatinas* (2.7 acres). During the First World War, it supplied 3 cavalry regiments, 2 cavalry sotnias (squadrons), and 1 battery. In 1918, it was liquidated.

Astrakhan Defense – from July 1919 to January 1920 during the Civil War, Soviet troops (from August the 11th army) led by S.M. Kirov and V.V. Kuibyshev fought off the attacks on Astrakhan of the White Guard of the Caucasus (General P.N. Vranghel), the Ural Cossack (General V.S. Tolstov) armies, and other units from the north, east, and southwest.

Astrakhan Fish Plant – a resolution for its establishment was passed in 1929, and in 1931 the canning factory started operating. Also commissioned were a glue-making workshop and a syrup plant; the first kilograms of fish meal were produced as well. At the same time a can-making workshop was built into which the equipment made in Italy was installed. Production of 9 kinds of 500 g cans of chastik (ordinary fish) and sturgeon in tomato sauce began. The caviar-balyk workshop produced caviar and balyk products from sturgeon. In 1993, the plant was transformed into the Open Joint Stock Company “Astrakhan Fish Combine.” Today, this is one of top fish-processing plants in the Volga-Caspian basin. It has three basic divisions: refrigerating workshops; a canning factory with workshops for fish processing and packaging of ready produce, fat rendering, and cooking; and power-generating, transport, and repair-and-construction workshops. An assortment of products include frozen and cooled fish products, canned products in oil, fish-vegetable cans, pastes, canned products in oil, canned products in tomato sauce, fish

meal, cooked products, sun-dried fish, salted fish, caviar of chastik fish (pike, common carp, bream, perch), caviar of sturgeon, balyk products, aluminum cans and tins, lids for tins with caviar, and others.

Astrakhan Fresh-Water Sea – planned by M.M. Krylov (1954) within the framework of the project to create water way from Moscow to Ashkhabad. It was proposed to construct in the Caspian Sea a coastal embankment 2,000 km long along the 6-m isobath, with construction of the Volga-Turkmen coastal canal via which water from the Volga and Ural Rivers would run. It was recommended to increase ice cover on the Northern Caspian by artificial cooling, thus reducing evaporation, which accounts for a great part of the sea water balance loss. Development of an ice cover in the Northern Caspian and along the western coast of the Middle Caspian would reduce heat loss approximately 15-fold. If necessary, sea level in the Northern Caspian may be lowered by 10–15 m, which makes it possible to create rather wide strip of the most valuable irrigated lands along the embankment on the seaside with an area over 2 million hectare and a shallow-water zone for more convenient development of oilfields. The project was not implemented.

Astrakhan Gas-Condensate Complex – built on the basis of the Astrakhan gas-condensate field (AGCF), it is the main producer of natural gas and condensate in the Lower Povolzhie. Sequential commissioning of 3 equal stages of the complex (in 1986, 1988, and 1991, respectively) was planned with a total extraction and processing capacity of 18 billion cubic meter of natural gas, up to 6–6.5 million tons of gas condensate, and production of 6 million tons of sulfur. The startup AGC complex (1st stage) with a capacity of 6 billion cubic meter of natural gas a year was commissioned in early 1988. The feasibility indices of the 1st and 2nd stages are identical. Each of them provides from natural gas processing an annual volume of 2.25 million tons of non-stable condensate and 1.63 million tons of stable condensate, 2.25 million tons of gas sulfur, 2.62 billion cubic meter of commercial natural gas, 240 thou t of liquefied gases, 510 thou t of ethane fraction, and 5 million cubic meter of helium. Design and construction defects revealed in the course of construction of the 1st stage of AGC (emissions of polycyclic aromatic hydrocarbons, etc.) caused serious damage to the natural environment in the region. Full-scale operation of AGC, located 90–110 km from the Astrakhan nature reserve, causes serious concern about the fate of natural ecosystems in the Volga delta because production wastes of AGC development pollute the air and water basins in the lower reaches of the Volga.

Astrakhan Gas-Condensate Field – discovered in 1976 on the left bank of Akhtuba, 80 km from Astrakhan near the small settlement Ak-Sarai (translated from the Kazakh language as “White City”). This field is often called Aksaraisky. It was explored and put into operation in 1986. The balance of recoverable reserves of free gas (as of the beginning of 1992) was equal to 2,695 billion cubic meter. For the period of this field’s development, more than 20 billion cubic meter of gas was extracted. The AGCF gas consists of ethane, propane, and butane (4.12%), stable

condensate (224.2 g/m³), hydrogen sulfur (up to 26%), nitrogen (0.63%), and carbon dioxide (14.5%). In addition, it contains helium, carbon oxysulfide, mercaptan sulfur, carbon disulfide, and heavy metals, including mercury. The balance of recoverable reserves of condensate are equal to 425 million tons, and the projected condensate reserves are 555.8 million tons. Every year, 3.3 billion cubic meter of gas are produced.

Astrakhan Gubernia – created by order of Peter I on November 22 (December 3), 1717 from the southern part of the Kazan Gubernia with the center in Astrakhan. It included 12 cities (6 uyezds): 10 cities in the Lower Povolzhie from Simbirsk to Astrakhan, as well as Yaitsky gorodok and Terek (Tarki), though from the late 1720 s, it only included the territory of the Lower Povolzhie. In 1785, A.G. was abolished, and its territory was included into the Kazan Gubernia (viceregency), which, in the course of the administrative-territorial reforms of Pavel I, was given the name of Astrakhan Gubernia. In 1802, it was divided into A.G. and the Caucasus Gubernia (from 1822, it was a region). Until 1832, A.G. was subordinate to the military chief of the Caucasus Territory and Georgia. In 1850, the system of division into *uyezds* was formed, and such *uyezds* as Astrakhansky, Yenotayevsky, Krasnoyarsky, Tsarevsky and Chernoyarsky appeared. A.G. included Kalmyk and Kirghiz steppes and the Astrakhan Cossack host as independent administrative units. The area of A.G. in 1898 was 207 thou sq. *verstas*, with a population of 1,003 thou, including 507 thou nomads and semi-nomads. The main occupation of the population was fishery and related occupations. Fish and other products from A.G. were supplied to the internal gubernias of Russia as well as abroad to Vienna, Berlin, and others. For the economics of A.G. of great importance was salt extraction from the Elton, the Baskunchak, and other lakes, accounting for approximately 20% of the salt production in Russia. Growing of vegetables, watermelons, horticulture, cattle breeding, silkworm breeding were also developed. Industry was represented by fat-rendering, leather-making, soap making, brick and milling productions. In the late nineteenth century, oil extraction and oil refining was developed in A.G.; here, the affiliates of joint stock companies “Branobel” (see Nobel Ludwig), “Mazut”, a ship-building plant and a metallurgical plant of A.Kh. Norens operated. A.G. was crossed by trade routes connecting Russia with Middle Asia. Since the 1870s, oil was supplied to European Russia via Astrakhan port on the Volga. In 1909, the Ryazan–Ural railway was constructed through A.G. By 1910, the population of A.G. was 1,281 thou. During the First World War, reserve military troops were stationed on the territory of A.G.

Astrakhan Khanate – a state in the steppes of the right bank of the Lower Volga and Northern Caspian with the capital Khadjitarkhan (Astrakhan). It was formed in the early sixteenth century after the Crimean Khanate defeated Big Horde (1502). Dominant religion is Islam. The Turk-speaking population of A.K. was engaged in nomadic cattle breeding, various crafts, and trade. Occupying the Volga delta, A.K. controlled the transit trade of Rus, Kazan Khanate with the states of Central Asia, Transcaucasus, Persia, and others. In 1556, A.K. joined Russia.

“**Astrakhan Kholodilnik**” – a joint stock company, one of the major firms providing storage and transportation of perishable products. In 1902, the Joint Stock Company “Union” (Britain) started construction of the first in Astrakhan refrigerator warehouse that was commissioned in 1912. In 1911, the company was established with the central office in Astrakhan. In 1912–1913, the company built there a second 6-floor refrigerator warehouse with a total area of 400 square *sazhen* (2.13 m) capable of accommodating 450 thou poods (16.38 kg). The equipment was ordered from the German Company “A. Borzig.” Circulating liquefied gas was used for cooling. Construction of such a refrigerating warehouse made it possible to reduce fish losses. The company also undertook construction and operation of special river vessels and refrigerator cars. In 1918, the company was nationalized and at present it is included into the Astrakhan Fish Combine.

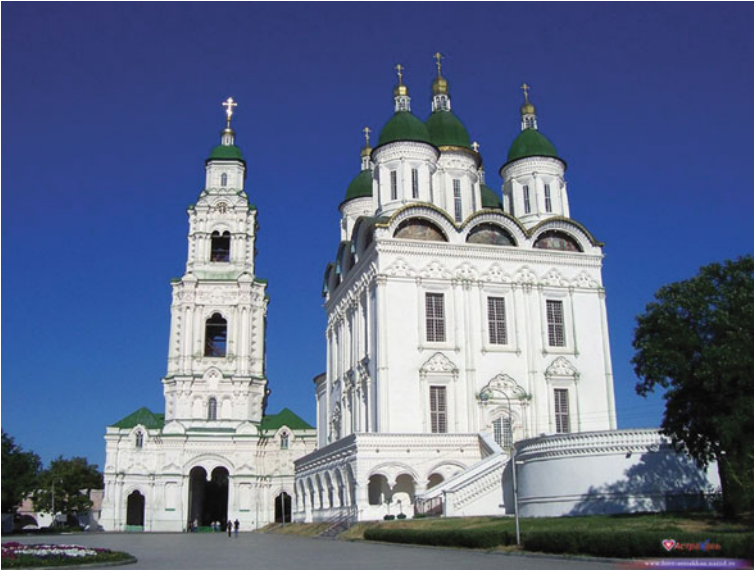
Astrakhan Kremlin – constructed from 1582 to 1589 from drawings of Fedor Kon that were approved by Moscow, the Kremlin was built of stone by Moscow masons Mikhail Veljaminov, Grigory Ovtsyn and deacon Dei Gubastyi. As N. Gumilev said, “it was a real archeological disaster,” because it was built of Tatar brick made at Batyi and taken from the ruins of the Sarai, the capital of the Golden Horde. Interestingly, Sarai was itself constructed of brick taken from the ruins of Itil, the ancient capital of Khazaria. A.K. was simultaneously a defense fortress and a complex of palaces and church buildings. It makes a wonderful architectural ensemble and is the main point of interest in Astrakhan.

The center of A.K. is a cathedral built in the name of the Holy Virgin Assumption. In 1593, in place of the old wooden church, they started construction of the Sinodical and Apostolic Churches. In 1660, a side chapel in the name of Holy Afanasyi and Kirill was added to it. This cathedral existed for less than 100 years. The construction of a new (modern) church, supervised by Russian architect D.M. Myakishev, was started in 1698 and finished in 1710. The total area of the building is 1,790 m², at a height including steeple of 75 m.

Among other places of interest is the Trinity Cathedral, consisting of three churches (Trinity, Purification, and Presentation), and two refectory chambers from 1593 to 1603. From 1696 to 1700, the cathedral was re-built. In 1677, the Kirill Chapel was constructed over the burial place of Kirill, the first hegumen of the Trinity Monastery, who died in 1576.

The walls of A.K. have three gates (Prechistensky gate with the over-gate cathedral bell tower and clocks from 1908 to 1912; the Red Gate from the sixteenth century with a total height, including the dome, of 34 m; and Nikolsky Gate with the over-gate Nikola Church from the seventeenth century) and 4 towers (Arkhieieiskaya, 1843, 15.6 m high; Zhitnaya, sixteenth century, 12.7 m high; Crimean, sixteenth century, 17 m high; Artillery, sixteenth century, 16 m high).

In 1980, the Astrakhan State United Historical-Architectural Nature Reserve-Museum was established on the basis of the monuments of A.K. In 1999, this unique architectural monument was placed on the UNESCO Register of world sites.



Astrakhan kremlin (<http://www.moikompass.ru/compas/astrakhan>)

Astrakhan Naval College – was created on the basis of the Astrakhan Naval School that was organized in 1944 as a basic educational institution for training of naval specialists, such as navigators, ship-builders, ship-mechanics. The history of naval education dates back to opening of the first navigation classes in Astrakhan in 1976. On the basis of A.N.C., establishment of the Caspian Branch of the Novorossiysk State Navy Academy and then the Astrakhan Institute of Water Transport is planned.

Astrakhan Naval Rescue-Coordinating Center – organized in 1994 within the framework of the Naval Administration of the Astrakhan port. Among the tasks of the Center are coordination of actions of rescue services of Russia and, if necessary, foreign states during search-rescue operations on the sea.

Astrakhan Port – located approximately 110 miles from the Astrakhan roads. By its position, it is the most important marine port. Despite unfavorable conditions impeding approach to it from the Caspian Sea by deep-draught vessels and despite the frozen Volga mouth and northern part of the sea, A.P. is by cargo volume in the former USSR second only to Baku on the Caspian Sea. In the A.P. area, the Volga has a width from 600 to 2,000 m. Here some arms deviate from the Volga, the largest of them are being Kizan, Tsarev, Kutum, and Bolda arms. In the A.P. water area there are 4 islands: Ilyinsky, Zayachyi, Proletarsky, and Gorodskoy. The Golden Creek is located between Proletarsky Island and the bank. The shipway in the port area is closer to the Volga left bank; its width is 250–300 m. A.P. comprises a merchant port, river merchant and fish ports, as well as several roads; port mooring

places are located on both banks of the Volga. The loading-unloading works in the port are completely mechanized with floating cranes. For various cargo-handling operations and servicing of ships the port has a great number of tow vessels, boats, and barges. Special creeks are available for ship anchorage in the wintertime.

Astrakhan Region – a part of the Russian Federation, since 2000 A.R. has been a part of the Southern Federal District. Its historical predecessor is the Astrakhan Gubernia. It was formed by Decree of the Presidium of the USSR Supreme Council of December 27, 1943. Its area is 44.1 thou km², or 0.3% of the whole territory of the Russian Federation (39% in the Volga basin). Its length from the west to the east between Kalmykia and Kazakhstan is 120 km and from the north to the south along the Volga and Akhtuba River as far as the Caspian Sea is 375 km. The total length of the land border is 1810.2 km, including a marine coastline of 298 km. A.R. has a land border with the Republic of Kazakhstan, and with Republic of Kalmykia (Russian Federation).

The population of A.R. is 1032.8 thou (2001), 67% of which is urban (750 thou in the Volga basin). A.R. is divided into 11 rural areas with 442 villages and settlements. The regional center is Astrakhan (population: 488.3 thou). In addition, the region has 6 cities the largest of which are Akhtubinsk (50.4 thou people), Znamensk (34.7 thou people), Kharabali (19.1 thou people), Kamyzyak (16 thou people), and Narimanov (12 thou people). The population density is 23.3 people/km². Representatives of over 150 ethnicities live here, including Russians (72%), Kazakh (13%), Tatar (7%), Ukrainians (2%).

The region locates in the southwest of Russia in the dry zones on plains of the Circum-Caspian Lowland, lying mainly below ocean level (from –2.7 m in the north to –27 m in the south). The highest point is Mount Bolshoe Bogdo, reaching 150 m. The climate here is continental and arid with average temperatures in January ranging from –10°C in the north to –6°C in the south and those in July being approximately 25°C. The total annual precipitation in the region varies from 240 mm in the north to 175 mm in the south. The vegetation period lasts for 210–216 days. River networks are formed by the Volga-Akhtuba floodplain with a great number of branches and a complex delta of the Volga with many arms. In the floodplains and deltas of the Volga, there are many *ilmens* (fresh-water lakes), while there are many salt lakes on the rest territory including Baskunchak and Solenoye. The largest of these is Baskunchak with an area of 115 km², where Russia's biggest complex for table salt production (one-fourth of the total production) operates. The territory of the region is covered with sagebrush-thistle semideserts on light-chestnut solonetz and brown soils. In the Volga floodplain and delta, the meadows on alluvial soils and floodplain forests and thickets of reeds along the banks of ilmens and branches prevail. The animal world is very diverse. Semideserts are populated with saigas, various rodents, eagles, various reptiles, and insects. In the Volga are found over 50 species of fish, largely of commercial significance and among which the most important are sturgeons. The Volga delta is a habitat for herons, cormorants, pelicans, and migrating waterfowl; mammals that exist include the wild boar. The Astrakhan nature reserve was established in 1919 for protection of the unique nature

complex in the Volga delta, including nesting of waterfowl, spawning grounds and hibernation pits of commercial fish, and relict and endemic plants. In 1974, nature reserve status was extended to water-boggy lands of the “Volga Delta,” which was declared by UNESCO as of world significance.

This region contains many mineral deposits. These include 7 oil and gas fields and natural gas (the Astrakhan gas-condensate field and Promyslovsky (in the Limansky District) opened in 1952 with commercial gas reserves estimated at 353 million cubic meter; Bugrinsky (in the Yenotayevsky District) opened in 1966 with gas reserves of 1,263 million cubic meter, which are being preserved for long-term storage; the North-Shadjinsky, which is planned for development, in the Yenotayevsky District with commercial reserves of gas C₁ at 1,428 million cubic meter and C₂ at 2,065 million cubic meter; and Alekseyevsky which is being prospected). Significant oilfields are: Beshkulsky in the Narimanovsky District) opened in 1963; Verbylyuzhie in the Kharabalinsky District and is under prospecting; and the 3 explored fields of Khvalynskaya, Sarmatskaya, and the Central with proven reserves of 200 million tons. Explored reserves in the region are: oil – 4 million tons, natural gas – 2.7 trillion cubic meter, gas condensate – 429 million tons. The most promising area in terms of hydrocarbon resources is the right-bank block of the Astrakhan field. Aside from table salt production in Baskunchak Lake, possibilities exist to organize bromine production from bromine-containing brine waters with an average bromine level 350 g/m³. There are raw materials for chemical and petrochemical industries in opokas (siliceous mountain rocks rich in amorphous silica) in the Kamenoyarsky field. Significant reserves of raw materials for construction, including clay (Volga delta) and gypsum (north of the region and Baskunchak Lake area), also exist. Three kinds of spa waters have been discovered near Astrakhan.

The territory of the modern region was already settled in the Neolithic. From the fourth century B.C.E. to the sixth century C.E., the Sarmats lived on this territory. In the mid-seventh century, the right bank of the Volga belonged to the Khazar kaganat, while the left bank was populated by the Pechenegs. From the eleventh century, the Polovtsy roamed along the Lower Volga area, and from the mid-thirteenth century in the period of the Mongols-Tatars invasions of Europe, the lands of the present-day region were included into Zolotaya Orda. After its breakup in the mid-fifteenth century they were joined to the Astrakhan Khanstvo that in 1557 was finally joined to the Russian state. After the foundation in 1558 of Astrakhan, these lands were quickly developed by Russian settlements. During the Time of Troubles, this territory was ravaged by the Cossacks. In the early seventeenth century, the Kalmyks populated the right bank of the Volga. From 1670 to 1671, this area was engulfed by the Peasants' War led by S.T. Razin, and in 1708, it was included into the Kazan Gubernia. In 1717, the Astrakhan Gubernia was formed. At this time, the construction of shipyards and a port in Astrakhna began. In 1785, the gubernia was transformed into the Caucasian Vicegerency Area; in 1796 it again turned into a gubernia. In 1806, the borders of the Kalmyk nomad area were moved 30–40 km away from the Volga and the Caspian Sea. In 1817, the Astrakhan Cossack Host was established.

By late nineteenth century, a railway passed through the gubernia, and several dozen industrial enterprises had been constructed. With the development of the Baku oilfields, the port in Astrakhan became one of the largest in Russia. In January 1918, after the armed struggle, the Soviet power was instituted in gubernia. During the Civil War, from summer-autumn 1919, Red Army troops and the Volga-Caspian Navy defended Astrakhan successfully and, as a result, the troops of A.I. Denikin and A.V. Kolchak could not establish direct contacts and interaction, which influenced, to a large extent, the outcome of the war. From 1929, the Astrakhan lands were a part of the Nizhegorodsky (from 1934, the Stanlingradsky) Territory, and this was so until 1943 when A.R. was formed. In the first 5-year periods, the industrial development of the region continued. During the World War II, the Caspian-Volga way was the vital water route for the country along which petroleum products from Baku were delivered to the central parts of the USSR. In the post-war years, the Astrakhan people took part in restoration of the destroyed industrial complex.

Present-day A.R. is an important industrial region in the south of Russia. The major economic branches developing in the region are fuel-energy and agricultural-industrial complexes. Traditional branches here are shipbuilding and ship repair (the large shipbuilding plant is "Lotos"), the fishery industry, vegetable and melon crop growing, chemical production, machine-building, light-industry and building-material enterprises. A large Astrakhan gas-condensate complex is also here. Transport is developing in the region, including an international sea port near Olya settlement. The region has factories producing knitted wear, garments, leather and footwear, and furs; various foodstuffs, liked canned fish, vegetables, meat, and table salt; shipbuilding and repair of ships; offshore drilling installations; and woodworking are also developed here. The industrial enterprises consist mostly of concentrate in Astrakhan and Akhtubinsk. The center of the military-industrial complex is Znamensk City (Kapustin Yar-1) with its spacecraft testing grounds. The Caspian Navy fleet that was transferred from Baku in 1992 is based here. The agricultural lands cover 34.37 thou km², including pastures (74.8%), haylands (13%), arable lands (12.1%) and approximately 13% that are occupied by industrial enterprises, transport, and communication. Over 0.1% of the territory is covered with water. The forest area in the region is 940 km². The agriculture specializes on growing rice and vegetables (mostly tomatoes and melons on irrigated floodplains), the rearing of mutton-wool sheep, dairy livestock, distant-range animal husbandry, camel breeding, and poultry production. In the recent years, cotton has acquired significance (in 1987 the first commercial yield of cotton was received).

The Volga delta and the Caspian Sea are major regions of sturgeon and chastic small fish fishing, including fish processing. A.R. was one of the major suppliers of black caviar and "red fish" to the world markets.

The region has a dense communication network. These include railways of approximately 600 km long (the Kizlyar (Daghestan)–Astrakhan–Agryz (Tatarstan), the Astrakhan–Elista–Stavropol, the Astrakhan–Volgograd, and the Astrakhan–Atyrau (Kazakhstan) lines). The total length of automobile roads is 3,000 km, including Astrakhan–Moscow 1,300 km, while navigable waterways measure up to 1,500 km. Eleven oil and gas pipelines go through the A.R. territory, including the

Tengiz (Kazakhstan)–Atyrau (Kazakhstan)–Astrakhan–Grozny with a total length 1,000 km and a diameter of 1,020 mm, the gas pipeline Makat (Kazakhstan)–Northern Caucasus with a length of 944 km and a diameter of 1,420 mm. Further development of pipeline transport system was related with opening in 2004 of the CPC oil pipeline Tengiz–Novorossiysk, 222 km of which goes through A.R.). Thanks to the Volga River and the Caspian Sea, the Astrakhan transport unit is the shortest and most convenient path connecting Europe with Central Asia, India, and Pakistan (the transport corridor Bombay (Mumbai, India)–Bender-Abbas (Iran)–Enzeli (Iran)–Caspian Sea–Astrakhan). Astrakhan has an international airport.

As of January 1, 1998, A.R. had 35 natural monuments of regional significance (33.7 thou ha), 2 state nature reserves (Astrakhansky (72.5 thou ha) and Bogdinsko-Baskunchaksky (18.5 thou ha)), and 3 state natural preserves of the regional significance (Bogdinsko-Baskunchaksky (35.2 thou ha), Ilmenno-Bugrovy (6.7 thou ha), Peski Berli (3.1 thou ha)). It also has 8 state hunting natural preserves and 25 hunting areas.

Nearby Astrakhan is one of Russia’s oldest spa mud resorts – “Tinaki”. Tourists visit the remnants of ancient cities in the Volga floodplain and delta, including what could be the ancient capital of the Khazar Kaganate (eighth to tenth centuries), Itil City, which lies 15 km north of Astrakhan, and the capital of Zolotaya orda, Sarai-Batu City (twelfth century) near the Selitrennoye settlement, 120 km to the north of Astrakhan.

Astrakhan Revolt (1705–1706) – an uprising of *strelets* (old Russian warriors) and *posad* people (tradespeople living around a fortified city) against taxes and despotism of the rulers from July 1705 – March 1706. The insurgent people seized Astrakhan, established an elected council of senior people that annulled some taxes and increased payments to *strelets*. The A.R. enveloped Krasny Yar, Cherny Yar, Guriev, Terki. The revolt was finally suppressed by troops of Peter I.

Astrakhan Roach, Ice-Fished – large, fleshy, semitransparent if looked at against the light; the roe is pink, hard, with transparent plates of fat around the roe. ARI are usually fished at the very beginning of the fishing season, under the fields of ice, when it has not yet used up its reserves of fat required for saving the roe and for travel to the spawning grounds. The same fish, if caught a month later in the Volga River, with roe ready for spawning, becomes lean, devoid of that taste and value, so typical of ice-fished roach.

Astrakhan Roads – a vast water area in the northwestern part of the Caspian Sea. It has great significance for navigation. The roads are 40 miles from the Volga River mouth. It is an anchorage area for heavy-draught vessels and a place for cargo reloading from marine vessels on roaders for its further transportation. A.R. is usually frozen from the first half of December to early March. The boundaries of the roads are rather conventional and depend on the Caspian Sea level and shoaling of this region due to deposition of sediments from the Volga River. The northern border is the beginning of the Volga-Caspian Canal which is cut from A.R. to the mouth of the Bakhtemir arm (its sea part).

“Astrakhan Shipbuilder” – a joint venture, open joint stock company, established in 1996 with participation of the Astrakhan Regional Administration. Among its founders are the OJSC Shipbuilding Plant “Red Barricades”, the OJSC “Shipbuilding Plant”, “Lotus”, “Elling”, OJSC “Marine Shipbuilding Plant” as well as the Central Design Bureau “Korall” (Ukraine), “Vympel” (Nizhny Novgorod). The purpose of A.S. is to realize the whole technological cycle of design and construction of ships and facilities for self-development as well as organization of the sale of ships constructed in the region on the Caspian market. In 1998–1999, A.S. finished construction of the drilling platform “Sunkar” for Offshore Kazakhstan Engineering Operating Company and assembled and upgraded oil platform “Astra” for “Lukoil” company.

Astrakhan Shipbuilding Production Association – established in 1973, it is the head enterprise of this association is the Astrakhan Sea Shipbuilding Plant, created in 1931. ASPA is engaged in development of modern technical equipment for prospecting and production of oil and gas on the continental shelf as well as construction of lift and other vessels for domestic needs and for export. It has constructed a self-propelled floating drilling installation (SFDI) of the “Caspiy” type, and in 1980, the head semi-submersible floating drilling installation (SFDI) “Shelf-G” was constructed that contained an anchorage system keeping the installation in place during drilling works.

Astrakhan State Biosphere Nature Reserve (Formerly V.I. Lenin Astrakhan Nature Reserve) – the first nature reserve established in the former USSR. It is located in the lower part of the Volga delta, one of the world’s largest. The date of its establishment is April 11, 1919, on the initiative of N.N. Podjampolsky and V.A. Khlebnikov, a scientist-ornithologist, specialist in forestry, and son of the renowned poet Velimir Khlebnikov (following their wills both are buried in Damchik settlement located in the western part of the Volga delta lower reaches, 12 km southwards of the big fishery village Poldnevoeye).

In November 1927, the first regulations of the Astrakhan State Nature Reserve were approved that recognized the need not to disturb the original nature in some areas of the Volga delta possessing vegetation and fauna unique in the world. A special research station was established. The territory of the nature reserve consisted of 3 areas: in the western (Damchiksky), the central (Trehhizbinsky) and the eastern (Obzhorovsky) parts of the Volga lower reaches covering a total area of 22,798 ha.

A considerable part of the nature reserve is occupied by a foredelta, an open, shallow-water expanse having most favorable conditions for fish and birds. In the Volga delta, there are also 2 state hunting preserves of local significance, and 9 hunting farms for breeding. Considerable land borders the preserve.

In 1968, at the A.S.B.N.R., an ornithological station was established with a view to study the dynamics of natural terrains, to record populations and catches of birds, etc. This station conducts studies in other nature reserves on the Caspian Sea.

By Resolution of the USSR Council of Ministers of February 2, 1971 “On Actions to Ensure Implementation by the Soviet Side of Commitments Ensuing from the Convention on Wetlands of International Importance Especially as

Waterfowl Habitat”, the Volga delta, including areas of A.W., was set aside as a protected area. After 1975, this nature reserve was included into the Wetland “Volga Delta,” with an area of 650,000 ha.

In 1984, by decision of UNESCO, A.R. was made an international biosphere reserves. In 1985, A.R. comprised three separate areas located in the Kamyzyaksky (Damchiksky, Trekhizbinsky), and Volodarsky (Obzhorovsky) districts of the Astrakhan Region, the total area of which made 62.5 thou ha with protected zones equaling 31 thou ha. A.R. includes the natural areas of the Volga delta in the Circum-Caspian bio-geographical province of the Palearctic.

The activities of A.R. are aimed at preservation and accumulation of natural resources and genetic funds in the Volga mouth and Caspian coastal area, studies of delta formation dynamics and life of cenoses for their economic development, protection of nesting grounds and migration of waterfowl, fish spawning grounds as well as rare plants, such as lotus (an aboriginal plant in the Volga delta, and beside the Kyzylagach Nature Reserve in Azerbaijan, the Astrakhan Reserve is the only place in Europe where it grows) and water chestnut.

The landscape of the nature reserve is made of a network of narrow channels (eriks), meandering lakes, ilmens, kultuks and foredelta running towards the sea for approximately 50 km. All water bodies in the nature reserve are fresh. Their depths range from 0.3 to 20 m.

In the water bodies of the nature reserve are found approximately 500 species of fresh-water invertebrate protozoa, rotifers, water fleas, crayfish, and larva of insects. The foredelta and kultuks are richly populated with protozoa.

The nature reserve has three types of vegetation – forest, meadow, and water. The inventory conducted in the late 1960s revealed 278 plant varieties, out of which 44 were water plants.

The fauna of A.R. belongs to the European type with elements of other types. Mammals are represented by approximately 30 species: otter, river beaver, muskrat, American mink, Russian muskrat, raccoon dog, jungle cat, fox, and others. Quite accidentally one can find the Caspian seal, saiga, and elk. In A.R. there are 230 bird species, out of which 84 are nesting, 105 appear during migration and hibernation, and approximately 40 are rarely seen. Waterfowls are the basis of ornithological fauna, among which the most numerous are geese: mute swans, gray geese, mallards, and red-billed ducks. The greatest wealth of A.R. are the nestlings of several species of herons, cormorants, pelicans, swallows, etc. Furthermore, A.R. is one of the most important areas of seasonal migration in the world. Especially high is the concentration of waterfowl and near-water fowl: geese (14 species), stints (25), swallows (7), waders (11 species). The total period of migration is 9 months a year (from March through November). A.R. is also the habitat of 27 bird species put on the *Russian Red Book*. Approximately 2,000 kinds of insects are found here. Water bodies of A.R. are inhabited by 61 fish species, including common carp, sea roach, tench, rudd, sheatfish, perch, pike perch, crucian carp, pike, sichel, some species of bullheads, and others. Migratory fish, like sturgeon and herring, are found in the nature reserve only on their way from the Caspian Sea up the Volga for spawning and then on their way back to the sea.

Astrakhan State Technical University – established in 1994 on the basis of the Astrakhan Technical Fishery and Fish Industry Institute (ATFFII), which was created in 1930 and whose name changed in 1934 to Astrakhan State Technical Fishery and Fish Industry Institute (ASTFFII). ASTU prepares specialists in 10 faculties (including, from 1962, a fishery faculty) and 40 chairs following the multilevel system of sequential post-secondary education: bachelor, specialist, master. The university has a solid material base with 6 study buildings, 10 hostels, a sports complex, a stadium, up-to-date technological equipment, computers, and training simulators. ASTU activities, including study processes and scientific-research work, are supported by 2 computer centers, computer classes on faculties and chairs. Science at ASTU takes a special position because it not only helps coping with particular urgent socioeconomic issues and problems facing the industry, in general, and the Astrakhan Region, in particular, but also ensures training of research and pedagogical specialists and improvement of the education quality of the specialists that graduate from this university. Scientists of ASTU are invited for implementation of Russian and international research programs, and research is conducted along such fundamental and priority lines as: dynamics of machines and problems of accuracy in machine-building; environmental issues of the Circum-Caspian region, especially in consideration of the conditions for development of gas-condensate field; biological and biotechnical methods of environment re-activation; synthesis, structure, and reaction capacity of organic compounds; fishery cybernetics; and information technologies. In 1996, ASTU established the Association of Universities of the Caspian States with permanent headquarters at ASTU.

Astrakhan Volga Water Divide – under construction from 1966 to 1973 in the Volga delta area, complex of hydraulic structures intended to create a temporary water backup of up to 4.5 m (water supply at a rate no less than 9,000 m³/s) in the upper part of the Volga delta to flood spawning grounds in the eastern part of the delta and in the lower part of the Volga-Astrakhan floodplain for 40–50 days, corresponding with the period of spring migration of fish for spawning. The divide was closed again in autumn for 30–50 days to direct the main shoals of anadromous and sturgeon fish to hibernate in the fore-delta zone adjoining the eastern part of the delta.

The complex includes the following objects:

1. Headworks on the Volga at the delta tip, 2 km downstream from the origin of the Buzan arm; the headworks axis crosses Podvodnyi Island. The headworks include: an earth dam 1,285 m long located on the left arm of the Volga parent bed; a reinforced concrete dam 1,120 m long with a spillway front of 880 m consisting of 33 regulating spans of 20 m each and two navigation spans of 110 m each. This dam is located on the right arm of the Volga and is a continuation of the earth dam; double-lane fish-pass lock with two openings of 10 m each; and a navigation derivation with a single-chamber dock-type lock on the right parent bank of the Volga.

2. A water-dividing earth dam 79.6 m long linked with the headworks via a connecting dam that is 1 km long. As a result of its construction, during operation of the divide, water does not spill from the eastern part of the delta to the western part. To ensure water exchange between the western and eastern parts of the delta, the water divide dam is provided with the following facilities: culverts where the dam crosses with eriks Sukhoy, Buzan, and Tyunya, and headworks where it crosses the channels Rycha, Bystraya, and Bushma.

During its existence, the water divide has worked only several times – in 1977, 1978, 1982, 1983, 1986, 1988, and 1989. Notably, even when the water divide is not operating it produces some backup effect on the Volga and facilitates a redistribution of the flow in the top part of the delta into the Buzan system.

Astrakhanka, Agrakhanka – a local name for herring.

Astrakhanka – a trawling boat for fishing with a hook net in use on the Caspian Sea. Its length is approximately 12.5 m, its width is about 2.4 m, its board height is about 2 m, and its draft is about 1.3 m. It is named for the place of its production, Astrakhan.

Atherina Caspian (*Atherina mochon pontica natio caspia*) – a subspecies of the *Atherinidae* family, one of the few forms of the Mediterranean origin in the Caspian fauna. A small fish with an elongated body and a rounded belly. Its mouth is large with many teeth. The eyes are big. Its length is from 6 to 15 cm, and its weight is around 13.5 g. The life duration is 4 or 5 years. The fish is pelagic, living in shoals. It is found everywhere in the sea. It reaches maturity by the age of 1 year, and it propagates in the southwestern part of the Northern Caspian near the Buzachi Peninsula and in the Greater Kyzylagach Bay. It eats plankton and at the same time it is a food for predatory sturgeon species, herring, pike, and perch. It has no commercial significance.

Atrau, Otrau – an uneven shoreline of a great lake or sea with multiple bays, islets and deltas, along with the mouths of river arms and sedimentary spits and shallows; “delta” (in the Kazakh language). The local Kazakh people still call the coastal northeastern strip of the Caspian Sea and the sea proper Atrau.

Atrek (Etrek) (*Etrek* – Turkmenian., *Atrak* – Persian) – a river in Turkmenistan and Iran. It runs along their shared border and flows into the Caspian Sea. Together with its tributaries, Sumbar and Chendir, its length is 635 km, of which 135 km are in Turkmen territory. Its watershed area is equal to 26.7 thou km². It originates in the Turkmen-Khorasansky Mountains from the confluence of the Sebaza and Sulyakha Rivers. At influx into the Caspian Sea, it forms a boggy delta. It has a mixed recharge. No ice cover is observed. The main tributary (right) is the Sumbar River (247 km long). After flowing out of the territory of Turkmenistan, the average annual flow is equal to 240 million cubic meter. In the lower reaches, it dries out due to water withdrawal for irrigation in Iran and only in spring (March–May) during the

annual floods do the waters reach the Caspian Sea. The whole flow in Turkmenistan is accumulated in 3 off-channel reservoirs: Kizil-an (1965), Mamedkul (1964), and Delili (1970).

A. flows over a territory composed of loose, mostly sandy and clay soils, and as a result, it has high water turbidity (25 kg/m^3 on average, which is 6-fold higher than in the Amudarya), while the maximum average monthly suspended matter content may exceed 170 kg/m^3 . It is the most turbid river in Central Asia. Accumulation of great quantities of sediments led to formation, in the lower reaches of A., of a vast flat sandy-clay delta cut by traces of old branches through meandering river. Archeological works on the Misriansky plain have shown that in ancient times, the main source of water for irrigation was a developed network of channels dug from the Sumbar-Atrek system.

Water mineralization during floods is 1 g/l , while in the low-flow period it reaches $2\text{--}4 \text{ g/l}$ with a maximum in some years of 10 g/l . In the past, the A. floodplains were covered by natural tugai forests. Now, they are cut out completely. The reed thickets are widely developed. The greater part of the delta is covered by solonchaks, takyr, and takyr-like solonchaks.

Kazvini was the first of the Oriental geographers who mentioned A. He writes that A flows through the Nisy and Abiverda Mountains (now the Peshtag ancient settlement in the Kaahki area). After Khabushan, A. rolls through the Dakhistan confines and then into the Caspian Sea. A. is 120 farsakh (1 farsakh equals to 7.5 km) long. It is very deep and, thus, not easily fordable.

In 1957, the USSR and Iran concluded a treaty on joint management of water and power resources of the boundary areas of A. At present, the waters of A. are jointly used by Turkmenistan and Iran.

Atrek River Delta – a system of ancient, young, and existing delta plains and river valleys, the largest one being the Essenguli Valley. It stretches as a wide strip in the very south of southwestern Turkmenistan, at absolute elevations below 10 m. On its flat-plain surface are distinguished mounds with steep slopes and a convex summit resembling Bayer's Mounds, stretching in a sub-latitudinal direction east, northeast, west, southwest. The height of the mounds is 10–12 m maximum, and their length is 2–3 km. Toward the west and southwest, together with the delta surface, they decrease in height from 1–2 m above ocean level to 7–10 m below ocean level. The delta surface in the west has an abs. elev. of -15 m , then -20 m . Typical of the delta are also solonchank depressions, with bottom elevations of $-24 \sim -25 \text{ m}$. The delta plain is veined with a system of gullies and dry channels. Summertime shoals in hot desert conditions beget in places rapidly-growing salinity of the soils. This reality compounded by a lack of water makes the area little used for agriculture.

Atropatena – “Country of Fire,” a name of one of the ancient states in the territory that is now the Azerbaijan Republic.

Atyrau (former Guriyev) – the central city of the Atyrau Region, the “oil capital of Kazakhstan,” in the Republic of Kazakhstan. It is located near the northern coast of

the Caspian Sea on both banks of the Ural River 40 km upstream of the Caspian Sea. It has a sea port and a railway terminal on the A.–Kandagach line. Its population is 144.9 thou (1996). In 1640 in this place, there was a Russian fishing settlement founded by fishery entrepreneurs, the brothers Gurievs, who constructed an uchug, an obstruction with networks across the river for catching fish and a wooden stockaded town for protection from invasions of nomads, over the Emba River mouth. In 1645, Mikhail Guriev, who was vested a right to ownership of the Ust-Yaitsky settlement, started construction of a stone town that was at one time called Kamennyi Yaik, or Yaik Guriev Town, or simply Guriev.

In A. can be distinguished 3 main parts: the old town on the right bank of the Ural River, the settlement Embaneft on the left bank of the Ural, and the settlement Oil-Processing Works (OPW) on the left bank of the Ural (Gypsum town). Prior to the twentieth century, the main industry here was fishing. Today, it is a large center of the petroleum, chemical, and fishery industries. The oil pipeline Uzen–A.–Samara was constructed here with a carrying capacity of 10–12 million ton a year. This unique oil pipeline was the world’s first in this series equipped with a system for *en-route* heating and is designed for transit of high-viscosity Mangyshlak oil. The second oil pipeline Kenkiyak–Orsk in Western Kazakhstan was earlier linked with A. Also built was an OPW, one of three available in Kazakhstan with a processing capacity of 5.2 million tons of oil a year and a processing depth of 39%; a fish canning plant; machine-building and ship-repair works; a building material plant and house-building works; a meat packing plant; as well as a pedagogical institute and some vocational schools and colleges. The reconstructed airport is capable of landing aircraft of any class. After Kazakhstan became independent and with the commencement of intensive oil prospecting and development by Western companies, the city changed enormously. A. now accommodates Directorate “Kazakhstan Caspyi Shelf” (KKSh) and JSC “Atyraubalyk”. The Atyrau Oil Transit Department is responsible for receiving all oil from Western Kazakhstan and their export. A sturgeon farm also operates and another is under construction in the Balykshinsky District.

Points of interest in the city include Makhambet Utemisov Dramatic Theatre, the historical museum and arts museum, and the Bridge “Eurasia.” The historical monuments to Beibarsu, Kurmangasy, Dina Nurpeisova, the memorial complex “Saraichik” in a village with the same name in the Makhambet District are also constructed. A monument structure, the “Pantheon of Tsars,” is also built, comprising 7 “kultypasov” with tombstones naming the 7 khans who ruled in the Great Steppe engraved on them. These names are: Golden Horde – Mengu-Timur (1266–1282), Toktagy (1291–1312), Zhanibek (1343–1357); and Nogaisk Horde – Omir Okas (unknown–1447), Shikh-Mamai (1642–1649), Zhusup (1544–1554); Kazakh Khan Kaym (1511–1518).

“Atyraubalyk” – an open joint stock company, one of the leading enterprises in Kazakhstan on production of ecologically safe and protein-rich fish products. It produces more than 70 items of products; among them are black caviar, balyk of sturgeon fish, cured fish, etc. It is located in Balykshi in Atyrau.

Atyrau Oil Processing Works (OPW “Atyrau”) – the largest works in Kazakhstan engaged in processing oil extracted in the Republic. It was commissioned in 1945, and at that time its output capacity was 80 t of oil a year. In the late 1990 s it was capable of processing 5.4 million tons a year. The works was constructed to process local “light” oils with a high potential content of light petroleum products, but over time, with the opening of new fields, the production of high-paraffin oils and later oils with a high sulfur content increased. The works operates the system with an output capacity of 3 million tons of oil a year and the installation for catalytic reforming with a capacity of 340 thou t a year. Kazakhstan’s first installation for slowdown coking has an output up to 700 thou t of petroleum coke and the installation for petroleum coke calcinations. The works produce commercial benzene, white spirit, fuel oil, aviation kerosene, furnace fuel, diesel fuel, vacuum gas oil, and calcinated coke. Strategically, the works are located in the center of the oil processing region, central to the web of the existing and under-design oil pipelines in Western Kazakhstan, is close to the Caspian Sea, and may utilize the ramified railway network.

Atyrau Region (formerly the Guriev Region, renamed in 1992) – a region of the Kazakh Soviet Socialist Republic, later the Republic of Kazakhstan formed in January 15, 1938. The area is approximately 118.6 thou km², and the administrative center is Atyrau (formerly Guriev). Its population as of 1996 is 461.6 thou.

A.R. is located in the west of Kazakhstan covering the northern, northwestern, and eastern coast of the Caspian Sea in the Circum-Caspian Lowlands. Only the most southeastern part the western margins of the Ustyurt Plateau is rising (the altitude is 200–340 m). A considerable area of the Circum-Caspian Lowland is covered by sands (Ryn-sands, Toisoigan, Caspian Karakums and others). Concerning mineral deposits, the most significant are oil reserves (Emba oilfield, natural gas, potassium salts, gypsum, table salt, and sodium sulfate).

The climate here is sharply continental and dry, experiencing hot summers and cold winters. The temperature in January is 3.5–10.5°C, while the average temperature in July is +26°C. Precipitation varies from 120 to 180 mm a year. The vegetation period lasts for approximately 230 days in the south and 200 days in the north. Strong winds are common. The main freshwater source is the Ural River, which has great fishing significance. The rivers Ural, Emba, and Sagyz become very shallow in summer, splitting into separate pools and in many places drying out completely. Lakes are mostly found in the river valleys and along the Caspian Sea, the largest among them being Inder, Zhamansor, and Teshketsor. The lakes are mostly saline and small; in summer, they dry out, turning into solonchaks and sors. A.R. is washed by the waters of the Caspian Sea. The coastline is slightly rugged. Great sturgeon (beluga), sturgeon, stellate sturgeon (sevruga), herring, sea roach, common carp, bream, and other are fished in the Caspian Sea, and seals are also hunted here. By the nature of the soils and vegetation cover, A.R. is referred to as desert and semidesert zones. The northern part of the region is covered by sagebrush-thistle and cereal-sagebrush deserts on brown soils. On the sands, wheat grass and sagebrush are well developed. River valleys (especially the Ural River Valley) are composed

of alluvial-meadow soils covered with cereal-grass vegetation, at times with poplar and willow thickets. In the central and southern parts of A.R., the sagebrush and thistle vegetation on brown soils with solonetz and solonchaks is developed. Forests grow on less than 1% of the region's territory.

A.R. is one of the least populated regions in the Republic of Kazakhstan (approximately 4% of the Republic's population). The population is represented mainly by Kazakhs, but the Russians, Ukrainians, and other peoples also live here. Average population density here is 1.5 people/km². The most densely populated area (80% of the overall population) is a narrow strip on both banks of the Ural River as well as a part adjoining the eastern arms of the Volga delta.

A.R. is the oldest oil-producing region in Kazakhstan. From 1920 to 1929, the oilfields Ben-Bike, Southern Makat, and Southern Baichunas with moderate reserves, but of great principal significance were discovered here. In 1936, major oilfields, such as Baichunas, Kulsary, and southern Iskine were found here. During the World War II, the Emba fields played a key role in ensuring a reliable supply to the army and home front. By the early 1960s, sixteen oilfields were discovered and prepared in the region with total reserves of approximately 100 million tons. Discovered in the mid-1970s, the giant Tengiz oilfield under a saline sea horizon opened the brightest prospective reserves for A.R., and their realization started in the late 1990s after Kazakhstan became independent.

In the early twenty-first century, the State Balance of the Kazakh Republic registered 117 fields of hydrocarbons in A.R., including 83 of oil and condensate and 34 of natural gas. The total predicted resources are estimated at 2.5 billion tons of oil or 89.3% of the Republic resources and 880 billion cubic meter of natural gas.

The main industries here are oil, gas (A.R. gives 47% of all natural gas extracted in the Republic), chemical, and fishery operations. Oil is produced in the settlements Makat, Koschagyl, Dossor, Kulsary, Karaton, and others. The major Tengiz oil and gas field is located here, too. Atyrau has a petroleum processing works. The following pipelines pass through here: Atyrau–Orsk; Uzen (Atyrau)–Samara (design transit capacity 32 million tons of oil a year, the actual capacity being 12–15 million ton); Tengiz–Novorossyisk (67 million tons of oil a year); Tengiz–Atyrau–Astrakhan (Kazakh section), which became the initial section of the Caspian Pipeline Consortium export pipeline. The oil pipelines Kenkiyak–Atyrau and Greater Chagan–Atyrau were recently constructed.

Metalworking, machine-building – in particular, vehicle and ship repair – industries are also developed.

Of the food industry, fish production and processing are most developed. Agriculture specializes in animal husbandry, while farming is only of a supplemental nature.

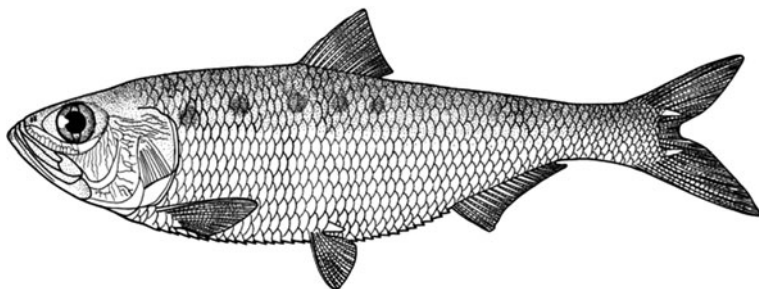
A.R. is crossed by the railway Atyrau–Kandygach. In the past there were regular ship lines Guriev–Astrakhan, Guriev–Fort-Shevchenko–Makhachkala, Guriev–Fort-Shevchenko–Bekdash-Baku. Of great importance is river transport along the Ural River.

The region has 182 schools, 7 colleges, 12 vocational schools and lyceums, and a center for children with developmental disabilities (in Atyrau). Among the higher

educational institutions are Atyrau University, named after Kh. Dosmukhamedov, the Oil and Gas Institute, as well as affiliates of the leading educational institutes of Russia and Kazakhstan. The Caspian Educational Center has also opened.

In 1995, the Treaty on Trade-Economic, Scientific-Technical and Cultural Cooperation with the Astrakhan Region was signed. The Main Office of the Astrakhan Region is in Atyrau.

Autumn Herring or Ladyfish (*Alosa brashnikovi autumnnalis*) – large herring, the back and head of which are dark-green. Its snout is pointed. It has 46–53 vertebrae, and its body length is from 26 to 33 cm. It inhabits coastal waters of the South Caspian, both in the east and in the west, making short migrations. Young fish are likely to travel outside their range in search of fodder. The spawning grounds are known to exist in the coastal zone, around Enzeli in the east and near Byandovan Cape in the west. Spawning occurs in the east at the end of March and in April and in the west in March at water temperature of 17–19°C. It feeds on kilka, gobies, silverside, shrimp. Reserves are small.



Autumn herring (<http://www.briancoad.com/species%20accounts/Acaspia-m.gif>)

Avandelta – a smoothly sloping, subhorizontal underwater accumulative surface being a continuation of a delta that on the sea side is confined by a narrow zone with visibly growing slopes at the bottom.

Avarskaya Koisu – right tributary of the Sulak River that connects with the Andiiskoye Koisu River in the Republic of Daghestan. It originates on the northeastern slope of the Main Caucasian Ridge. In its upstream reaches it is called Djurmut. Its total length is 178 km with an average slope of 13.7%. Its watershed area is 7,600 km². The total number of rivers in the basin is 1,440, of which the length of 52 is more than 10 km.

Avartsy (self-called – *maarulal*, which means “highlander”; *maar* – “mountain”) – people inhabiting the western part of the Daghestan mountains and the north-western regions of the Azerbaijan Republic. In the Russian Federation census of 1989, their population was 534 thou. Avartsy living to the north of Khuzakh village are called *maarulal*, and they speak a Khunzakhsky dialect of the Avarsky language; all other A. are called *bugulal* (the word is used in the sense of “rude,

untidy, eating fresh meat”), and they speak an Antsukhsky dialect. These are the two main dialects of the Avarsky language of the Nakhsky-Daghestan group of the North-Caucasian family of languages. Being kindred in languages and main features of culture and everyday life, the Ando-Tsezsky peoples (Andins, Akhvakhtsy, Bugulaly, Botlikhtsy, Godoberintsy, Karatiny, Tindaly, Chamalaly, Beshtintsy, Tsezy (Didaitsey), Khvarshiny, Gunzibtsy, Ginuztsy) as well as the Archintsy nearly merged with A. The total population of A. and peoples close to them only in Daghestan was 524 thou in the census of 1993. A. are aboriginal to the northeastern Caucasus range. The first written evidences of Avartsy’s ancestors living in their current territories coincide with the beginning of our era. A. are Sunni Moslems. People living in mountains are occupied with breeding of sheep and large-horn cattle, while they farm and grow fruit in the valleys. They also produce handicraft-artisan products.

Ayuka (1642–1724) – Khan of Volga Kalmyks (from 1672) and sworn subject of Russia. His troops took part in suppressing the Astrakhan and Bulavinsky uprisings as well as in the Northern War of 1700–1721. A. met Peter I twice during the Persian Campaign in 1722. During their second meeting 15 verstas to the north of Astrakhan, they defined the targets and tasks for the Kalmyks units that joined the Russian troops. They were to control the northwestern coastline of the Caspian Sea during the passage of the Russian fleet. Tsar Peter granted A. a battle saber decorated with diamonds. In their turn, Ayuka’s men-of-arms sent archers that formed a perimeter around the participants of this meeting. During this ceremony, the steppe people said to the Russians: “This saber and these arrows will be always ready to defeat the enemies of Russia.”

Azami – name of Tarki village and its surroundings in the Republic of Daghestan.

Azerbaijan – see *Azerbaijan Republic*

Azerbaijan International Operating Company (AIOC) – established in 1994 to fulfill the “Contract of the Century”, or as it is also called, the Baku (Gyulistan) Oil Contract, which is the 30 year development plan for the Caspian oilfields Azeri, Chirag and Gunashli. Since the breakup of the Soviet Union, AIOC is the first group of foreign companies testing the viability of pumping oil from the Caspian Sea to the world markets. AIOC unites 12 of the world’s major oil companies: Amoco, Pennzoil, Unocal, and ExxonMobil (USA); the State Oil Company of Azerbaijan Republic (SOCAR); British Petroleum and RamCo (Britain); LUKoil (Russia); Statoil (Norway); TPAO (Turkey); Delta Hess (Saudi Arabia and USA); and ITOCHU (Japan). On October 9, 1995, AIOC decided on two parallel routes to transit “early” oil”: through Georgia (“western route”) and through Russia (“northern route”). On February 16, 1996, AIOC signed an Agreement with the Azeri Government “to support “early oil” transit over the “Russian route.” “Transneft,” SOCAR, and AIOC were all signatories of the Agreement on Early Oil Transit over the Russian Territory. AIOC set up the Georgian Pipeline Company for coordination of a project on “early oil” transit via the Georgian territory.

Azerbaijan Republic – state in the southeastern part of the Transcaucasia, on the coast of the Caspian Sea. It is first mentioned by ancient Greek and Latin authors such as Atropatene; by later geographers, (called Adorbadagan; in Iranian: Azarbadagan); and in Arab sources (called Adarbandjan or Azarbandjan). The latter is a Persian name meaning “gathering fire” (in Persian: *az ar* – “fire,” *badagan* – “gathering”) and it is associated with the ancient cult of fire worship. Borders Russia on the north (the Republic of Daghestan (370 km)), Georgia on the north-west, Armenia and Turkey on the southwest, and Iran in the south. On the east, it is washed by the Caspian Sea. The territory is 86.6 thou km². Its capital is Baku (population: 1.9 millions in 2008). Large cities are Ganja (population: 313 thou), Sumgait (population: 358 thou), Mingachevir (population: 100 thou), Sheki, Lenkoran, and Nakhichevan. It has 65 administrative-territorial divisions as well as the Nakhichevan Autonomous Republic. Its monetary unit is the manat.

A. has exceptionally diverse climate conditions, surface and ground waters, soils, vegetation, wildlife and rich mineral deposits. Nearly all types of landscapes and climates that exist on the globe (except for tropical forests and savannah) are found in Azerbaijan, which as a whole correlates with the general rule of vertical zonality, though atypical zonal phenomena do exist in the country. Nearly half of the country’s territory is covered by mountains. In relief, there are four major regions: the Greater Caucasus with the Main Caucasus Ridge (Bazardüzü Mountain: 4,466 m) and the Lateral Ridge in the north; the Smaller Caucasus comprising many ridges with the neighboring Karabakh volcanic highland with lava plateaus and cones of dead volcanoes in the southwest; and sandwiched between them is the Kura Depression with the Kura-Araks Lowland in its central part. The Talysh and Lenkoran Mountains are in the far southeast. The Kura and Araks Rivers divide the lowland into plains, including the Shirvan, Karabakh, Mil, Mugan, Saljan, and Southeastern Shirvan. In the Kura-Araks Lowlands are found more than 200 mud volcanoes. A considerable part of the Kura-Araks Lowland, Samur-Divichi and Lenkoran lowlands, and also the eastern half of the Apsheron Peninsula lie lower than ocean level (up to –28 m). The Nakhichevan Autonomous Republic is located in a basin in the middle reaches of the Araks River, the Zangezur and Daralagez Ridges rimming it. The Apsheron Peninsula juts out deeply into the Caspian Sea. Within A.R. northwards of the Apsheron Peninsula the shoreline is slightly irregular. Further to the south, 2 large bays jut into the land: Baku Bay and Kyzylagach Bay. Many regions in the country are characterized by high seismic activity.

Considering its different relief forms, the specifics of atmospheric circulation, and the effect of the Caspian Sea, the climate of A. is very diverse. Here are the climates of semi-deserts and dry steppes, including subtropical, moderately cold, and cold regions. High climatic zoning is typical. The average annual temperature ranges from +15°C in lowlands to 0°C and lower in the mountains. The average temperature in January is from 0 to +3°C on the flatlands and from +3 to –10°C in mountains, while in July, the temperature ranges from 25 to 5°C, respectively. Precipitation is from 200 mm in the piedmonts to 1,400 mm a year in mountains and in the Lenkoran Lowlands.

All rivers in A. belong to the Caspian Sea basin and form three groups: rivers of the Kura River basin (without Araks River); rivers of the Araz (Araks) River basin; and rivers flowing into the Caspian Sea. There is 1 thou of them in total, and their overall length is 33.6 thou km in a watershed area of 85.5 thou km². Twenty six rivers have a length of more than 100 km. The longest rivers are the Kura (1,515 km); the Araz (Araks), a tributary of Kura, (1,072 km); the Ganykh (Alazani), a tributary of Kura, (413 km); and others. A. has 4 large and over 50 small- and medium-size reservoirs. The largest and most viable waterway in the Caucasus Range is the Kura River; its flow is regulated by the Mingechaur reservoir. It flows from the northwest to the southeast into the Caspian Sea, though only 900 km of its length are within A. The largest tributary is the Araks, which originates in Turkey and flows along the southern border of the country. Of the rivers flowing into the Caspian Sea, the most significant are the Samur, the Kusarchai, the Kudialchai, the Velvelichai, the Sumgait, and the Pirsagat (which does not reach the sea). Within the country, there are 250 lakes, the largest of which are Sarysu, Aggiol, Agzybirchala.

Due to uneven distribution of surface waters in the republic, fresh ground water, which is actively exploited, can be found almost everywhere.

Soils and vegetation in the country are arranged by zones. The zone from the lowlands to an altitude of 200 m is composed largely of gray soils, while higher mountain-forest and mountain-meadow predominate above 200 m. On the Lenkoran lowland, yellow soils are developed. The vegetation of deserts, semideserts, and dry steppes (Kura-Araks Lowland and Apsheron Peninsula) is replaced in mountain zones with wide-leaved forests (Caucasian oak, hornbeam, Oriental beech, chestnut, iron tree), while higher zones - sub-Alpine and Alpine meadows. Only in A. is the Eldarian pine found. Among wild flora are many useful plants for medicine, essential oil, tanning, painting, vitamin-bearing, mellific products, wild fruit, forage, decoration, and other. In the Kura lower reaches, the Caspian lotus is found.

The animal world is also rich and diverse. The Caspian Sea coast abounds with water fowl, especially in the Kyzylagach nature reserve (established in 1929). In the lowlands, Persian gazelle, fox, wolf, many rodents, snakes, and tortoises are found, while in the forests of the Lenkoran Lowland are found wild boar, jackal, and jungle cat. On the slopes of the Talysh mountains are leopard, lynx, badger, marten, etc, and in the highlands are Asiatic moufflon and bezoar goat. In the Caspian Sea, efforts are underway to restore fish populations, including beluga, sturgeon, sevruga as well as commercial fish species, such as kutum, common carp, sea roach, asp, sprat, herring in addition to Caspian seal. The Kura River is also rich in fish.

From ancient times, A. is one of the world regions whose fate and development has been associated with oil. Oil is the "blood" of A. The first mention of oilfields may be dated to the seventh and eighth centuries C.E. Of world significance are oilfields of high-quality (non-sour, aromatic), producing both oil and natural gas, on the Apsheron Peninsula in the Caspian Sea (including Neft Dashlary - Neftyaney Kamni, Artyom Island, Duvanny Island, and others), Kobystan, and the Lower Kura Depression. Oil reserves in the Azeri sector of the Caspian Sea are estimated at

3.5–5 billion tons of oil and 1,000 billion cubic meter of natural gas. In 1999, A. declared the availability of enormous reserves of natural gas (700 billion cubic meter) and gas condensate (250 million tons) in the shelf structure of Shakh-Deniz. In the piedmonts of the Smaller Caucasus near Naftalan is a unit deposit of curative oil, too. The republic also has rich deposits of iron (Dashkesan), alunite (Alunitdag), copper (Kedabek), cobalt (Dashkesan), barite (Chovdar), molybdenum (Paragachai), lead (Mekhmana), iron pyrite (Chiragidzor), table salt (Nakhichevan), etc., as well as deposits of chromite, gold, nickel, mercury, polymetals and others. There are also many cold and thermal mineral water sources.

A. is one of the most ancient seats of civilization. In ancient times the territory of A. was populated with multiple tribes which, in the course of their historical development, united into tribal unions that gave birth to the first state formations. In the tenth century B.C.E., the ancient state Manna was formed on the territory of present-day A. By the end of the seventh century B.C.E. it was replaced with Midia, a powerful state of Ancient East, that comprised areas of Southern (Iranian) Azerbaijan (Smaller Midia later called Atropatena). This state existed till the year 150 C.E. Its territory coincided in general with the borders of Southern (Iranian) Azerbaijan.

The greater part of the territory of present-day A.R. was called in ancient times Albania or Caucasian Albania, the state power of which was established no later than the third century B.C.E. By the end of the fourth century, Albania was conquered by Persia. In later times, Arabs, Turks-Seljuks, and Mongolians invaded here. By the eighth century, Atropatena and Caucasian Albania were included into the Arab Caliphate. At the end of the fourteenth and fifteenth centuries, the Shirvan state dominated here, and new states appeared, including Karakoyunlu and Akkoyunlu. At the end of the sixteenth century, Persia and Turkey struggled for domination in the Trans-Caucasus region. From this time until the eighteenth century, the country was a part of the Sefevid state.

As a result of the Russian-Persian wars of 1805–1813 and 1826–1828, the greater part of Northern A. entered into the Russian state. Peace treaties with Russia with Persia (1813: Gyulistan and 1828: Turkmanchai, respectively) set the southern borders of A. that have survived to the present. In November 1917, Soviet power was established in A., but it lost its grip for some time, and in 1918 the Azerbaijan Democratic Republic, which existed for 23 months, was declared. In 1920, Soviet power was re-established in the country, and the Azerbaijan Soviet Socialist Republic was formed. In 1922, A. became a part of the USSR as a Union Republic (Azerbaijan SSR).

In 1988, conflict arose between A. and Armenia over Nagorny-Karabakh, an ethnic Armenian enclave in the mountainous east of A, which turned into an armed clash. For several years, an undeclared war was waged over the disputed territory (in 1923 the Nagorno-Karabakh Autonomous Region (NKAR) was formed within A.). In 1991, at an extraordinary session of the Supreme Council of the Azerbaijan Republic, abolishment of the NKAR status was declared. In response, a joint session of the NKAR Regional Council and the Regional Council of the Shaumyan

Region declared, on September 2, 1992, that Nagorno-Karabakh Republic (NKR) was within the borders of the former NKAR and Shaumyan Region. On December 10, 1991, a public referendum was held, and the greater part of the population voted for independence from Azerbaijan SSR. On January 6, 1992, the NKR Parliament passed the Declaration on NKR State Independence.

Beginning in May 1994, military actions were stopped on the Karabakh front.

In 1991, the Supreme Council of A. passed the Declaration on Restoration of State Independence on the basis of 1918 Act. The same session adopted the Constitutional Act "On State Independence of the Azerbaijan Republic". In 1991, A. entered the Commonwealth of Independent States (CIS).

A. has been a UN member since March 2, 1992 and also a member of ADB, EBRD, OSCE, ESCAP et al.

The head of the state is the President. The supreme legislative body, the Milli Medjlis, is a permanently acting one-chamber parliament whose representatives are elected for 5 year terms. The chairman presides over Milli Medjlis. The highest executive body is the Cabinet of Ministers headed by Prime Minister.

In the course of a long historical evolution and persistent struggle against foreign (Assirian, Akhmenid, Greek-Macedonian, Roman, etc.) conquerors, the nucleus of ancient Azerbaijan (Atropaten) population was established that incorporated the tribes living on originally Azeri lands. With time, other ethnic groups joined this nucleus. On the threshold of a new era, the ancient population of Azerbaijan is on a rather high historical development level: the process of ethnic merging of different tribes into a single population and evolvement of Azerbaijan statehood continues to progress.

The ethnographic groups of Azerbaijani people include Airums, Karapanakhs, Padars, Shakhsevens, Karadags, and Afshars. Azerbaijan people account for 89% of the country's population. There are also Russians, Lezgin, Armenians, Avarians, Tatars, Jews, Talyshes, Turks, Tsakhurs, Kurds, Tatys, and others living in this country.

The population of A. is 9 million people (estimation for 2010), and its density is 9.4 people/km². Less densely populated are regions of the Greater and Smaller Caucasus. Densely populated are fertile areas of the Kura-Araks lowland and the northeastern slopes of the Greater Caucasus. The highest population density is found on the Apsheron Peninsula, where more than 40% of the Azerbaijan population lives. The average population density here is 88 people/km²

The population of A. is highly literate. It has a well-developed system of higher education, including 33 public and 17 private educational institutions (21 universities, 6 academies, 18 institutes, etc.).

The scientific center is the National Academy of Sciences of Azerbaijan.

The Azerbaijanians speak the Azerbaijan language (a dialect of the Oguz group of the Turkish language family). A great role in the formation of the Azerbaijan language was played by the well-known Azerbaijanian poet Mukhammed Fizuli. The Azerbaijan language uses the Roman alphabet. Rather frequently used are also Russian and other languages.

Although Christianity was the main religion in the region up to the eighth century, historical and cultural roots led to the domination of Islam in A. The greater part of the population is Shiite. In independent A., Islam has retaken its central place. Old mosques have been restored and new ones have been built, religious schools have been opened, and an Islamic University has been established.

The most significant product of the national-ethnic culture of the Azerbaijanian people is the dastan (heroic poem), “Kitab-Dede Gorgud.” Rich cultural traditions can also be found in the folklore (dastan “Ker-Oglsh”, Ashug-Garib”, fairy-tales, songs, humorous stories–lyatifa and others). In the eleventh to twelfth centuries, Azerbaijanian rulers held court with such renowned poets-thinkers as Khagani Shirvani and Nizami Gandjevi. In the sixteenth century, Mukhammed Fizuli created his works, and in the eighteenth century, the poets Vidali and Vagif wrote. In the nineteenth century was Mirza Fatali Akhundov. Here outstanding representatives of various public-political and religious-philosophical trends, such as Abdulkhasan Bakhmaniiar, Siradjaddin Urmavi, Nassireddin Tusi and others, should also be mentioned. The monuments of medieval architecture are further proof of the Azerbaijanian people’s genius, including: Maiden’s Tower and the Citadel Walls (twelfth century); the Palace of Shirvan-Shakhs (fifteenth century) in Baku; the Mausoleum of Momine-kha-tun and Yusif ibn Kusejira in Nakhichevan (twelfth century); the mausoleums and various defense structures in Ganja, Barda, maraga Urmin; the huge palace complex “Khesht-bekhisht” (translated as “Eight Skies”) and “Gei-mesjid” (“Blue Mosque”) in Tebriz; and many others. The architectural monuments that have survived to the present demonstrate a high level of architectural development that applied local materials, stone carving – a cultural complex “Gei-Imam” dated from the fourteenth to seventeenth centuries – and included in Djuma-mosque of the eighteenth century, Maiden’s Tower, and others. Also to be admired is the art of ceramic decoration, miniatures, artistic metalworking, and carpet-making. Furthermore, A. boasts a high musical culture and well-developed film-making.

A. is an industrial-agrarian country. Its economy is based on oil extraction and refining (3rd place in CIS after Russia and Kazakhstan). In the late nineteenth – early twentieth centuries, the first oil boom was witnessed in Baku. In 1901, A. was responsible for half of the world’s oil production, and during Soviet times, A. supported more than 70% of the national economic needs. Beginning in 1949, A. began oil extraction from the Caspian Sea bed, with seventeen refineries accounting for 80% of the USSR’s oil needs. After becoming independent, A. survives on a second oil boom, exporting approximately 2.5 million tons of oil a year, with numerous foreign companies involved in oil and natural gas prospecting and production. In addition, A. has always had a well-developed petrochemical and oil machine-building, the success of which has been vital to other economic sectors, including electrical engineering, machine-building, and ferrous metallurgy.

But agriculture is also an important player in the country’s economy. Out of the total land area (8.7 million hectare) of A., agricultural lands account for approximately 3.5 million hectare, out of which 1.7 million hectare, including 1.1

million hectare of irrigated lands, are arable lands, while 2 million hectare are summer and winter pastures. For irrigation purposes, the Upper-Karabakh, Upper-Shirvan, and Samur-Apsheron canals, a diversified irrigation network with drainage facilities, were constructed. By size of sown areas, the main crops are cereals (wheat, rice, and winter barley). Among cash forage crops, the most important are cotton and tobacco. The granary of A. is the Kura-Araks Lowland, which is also a leader in cotton production. Here, corn, grapes, vegetables, and other crops are successfully cultivated; on the Apsheron Peninsula, on the other hand, crocus, olive, curative grapes, shvany, and figs are grown. In Talysh, in conditions very close to humid subtropics, are cultivated tea, Grecian laurel, feijoa, persimmon, rice, grapes, citrus trees, and vegetable-melon crops. Tea is also grown on the southern slopes of the Main Caucasus Ridge along with nut trees (small nuts and English walnut and chestnut) and tobacco.

Husbandry is also actively pursued with large-horned cattle (cows, buffalos and zebu), sheep, and poultry. Sericulture (one of the oldest branches of agriculture) and apiculture are also active.

A. has a developed transport network. Railways with a total length of 1,600 km connect A. with Georgia, Russia, Iran, and Armenia. A dense network of automobile roads is 25,000 km long, of which 94% is paved. Long-haul cargo carriers are mainly out of Iran and Turkey. A. also has several ports free of ice throughout the year, including Baku and Lenkoran. In 1962, a marine railway ferry Baku–Turkmenbashi (formerly Krasnovodsk) was commissioned. Of special importance to transport are the pipelines running through the country: the 1,130 km oil pipelines, the 630 km of oil-product pipelines, and the 1,240 km of gas pipelines. Among the oil pipelines, the most important are Baku–Novorossiisk (Russia) and the Baku–Supsa (Georgia), and Baku – Tbilisi (Georgia) – Ceyhan (Turkey). After the opening of the major gas field at Shakh-Deniz, several gas pipelines have been slated for construction, foremost of which is the Baku–Tbilisi (Georgia)–Erzrum (Turkey). In recent years, the significance of oil transportation by tanker from Kazakhstan has increased drastically, demanding construction of oil terminals. Finally, the republic is linked by air with many countries of Europe and the Arab East; Baku has an international airport.

From ancient times when caravans of treasures passed along the Silk Road between Europe and China, A. has been at the crossroads of Eurasia. At present, construction of new Eurasian transport way is being considered, the grandest estimate being development of a new Great Silk Road. Envisioned are railway and automobile routes that will go from Europe via Turkey through Georgia and A., then across the Caspian Sea to Central Asia, and finally into China, Japan, and down through Southeast Asia. It is intended to establish wide-scale use of the transport corridor from “Europe – Caucasus – Asia” (TRASECA).

Azerbaijan’s chief exports are oil (81%), petroleum products, petrochemical products, cotton fiber, rolled stock of non-alloy steel, vines, tobacco, equipment for oil and chemical industries. Its main foreign-economic partners are Russia, Turkey, Iran, and Georgia.



Map of Azerbaijan (http://azembassy.co.kr/sefirlik/az/azerbaijan_map.jpg)

Azerbaijan Research Institute for Fishery (Aznirkh) – established on the basis of the Azerbaijan Scientific-Production Station, which was transformed into the Azerbaijan Branch of CNIORKh. Later, this branch returned to CaspNIRKKh, and in 1992, it became an independent institute. Its basic research is connected with the scientific justification for preservation, reproduction, and rational management of biological resources in the Caspian Sea.

Azerbaijan State Caspian Sea Steamship Line – established in 1992 and headquartered in Baku, it is the largest ship owner on the Caspian. Its fleet includes 69 vessels, including tankers, dry-cargo, and other special-purpose ships. Its dry-cargo ships are of the class “river–sea.” It has 6 modern cargo-passenger ferries servicing the Baku–Turkmenbashi line. In addition, 2 marine cargo-passenger ferries are in operation, both of which were built in compliance with the European (Swedish) specifications for the Baltic Sea. Each is capable of simultaneously taking onboard 28 railway cars or 40 trailers, 202 passengers, and 50 cars. There are also 2 ships of the “Ro-Ro” class. The company also incorporates the Ship Repair Association (“Kasp morsudoremont”), the Basin Authorities on Marine Routes (“Kasp morput”), a research institute and central design bureau, an information-computing center, the Azerbaijan State Marine Academy, and trade, procurement, and agency organizations.

Azerbaijanis – people composing the majority population of the Azerbaijan Republic. The population of A. in Azerbaijan is 6 million, while in Iran 15 million live mostly in the northwest, in so-called Iranian Azerbaijan. In the Russian Federation, approximately 337 thou A. reside. The religion of A. is mostly Shiite Moslem, though there is a minority Sunni population. Historically established ethnographic groups of A. are Airums, Karapanakhs, Padars, Shakhsevens, Karadags, and Afshars, which, until recently, maintained (and in Iran continue to maintain) some autonomous economic, cultural, and lifestyle features. The basic Azerbaijani occupation is farming and animal husbandry, though horticulture and grape-growing are also developed. At the time of independence there were also small and medium trade businesses (early vegetables, fruits, re-sale of import goods).

Azerbaijani (or Kura) Roach (*Rutilus rutilus caspicis nation kurensis*) – semi-anadromous fish, common near the western shores of the Southern Caspian, occurs in small quantities in the Kura River and its adventive water bodies, where the fish forms separate populations. The length of the roach body is 9–29 cm and its mass is from 15 to 50 g; the females are larger than males. The spawning grounds are in Smaller Kyzylgach Bay. Spawning commences in the second decade of March and continues in April at water temperature from 7 to 19°C. The seaward run of juvenile fish occurs from the end of April to August, with some of the young fish remaining in the bay. Roach is an important commercial species of Azerbaijan, yet its reserves have declined sharply of late.

Azeri – one of three marine oilfields (in addition to the Gyuneshli and Chirag) within the contract area of the “Contract of the Century”. It was discovered in 1988 and was formerly called “26 Baku Commissars”. It is located 130 km southeast of Baku in the Caspian Sea (according to the data of the Turkmenistan Foreign Ministry, the distance is 160 km) at a depth of 300–400 m. Drilling is planned for 3,000 m. The oilfield is being developed by AMOC. Oil reserves are estimated at 510 million tons; natural gas reserves are estimated at 90 billion cubic meter.

Azov–Caspian Canal – a project on gravity transfer of saline waters from the Black and Azov Seas to the Caspian Sea to maintain a permanent optimal level in the Caspian by construction of a power plant cascade. The Caspian Sea level is 27–28 m lower than the level in the Black and Azov Seas. In the late nineteenth to early twentieth centuries, the idea of linking the Black and Azov Seas with the Caspian excited renowned engineers Fruston, Blume, Bergstresse, Danilov, Lokhtin, Yashevsky, Bernard, and Vladimir (son of D.I. Mendeleev). Bergstreser, the manager of the Astrakhan Salinity Department, asserted the idea of linking the seas via Manych. For this purpose, in 1859, he decided to sail ships along the entire Manych River. A ship was launched near Kek-Usun Lake in the Sostensky system. One ship reached the Sea of Azov. All in all the boats covered approximately 500 versts, of which, for

200 versts they had to be portaged because in many places the Manych had no water. In the Soviet time, this issue was raised more than once; however, in the opinion of ichthyologists, more saline the Black Sea water in the Northern Caspian may affect the life and reproduction of both Caspian and Azov fish populations. At present, the idea of the construction of the canal is rejected.

B

Babol – a city located 25 km from the Caspian Sea on the east–west road connecting the coastal provinces of Gilan and Mazandaran. Founded in the sixteenth century, it was once a heavy-duty river port. Since the early nineteenth century, it has been one of the major cities in the province. Ruins of some ancient buildings are found here. Food and cotton ginning factories are also located here. The population is over 283 thou as of 2006.

Babol – a river flowing into the Caspian Sea near Babolsar. It originates in the Savadhuk Mountains and is one of the major rivers in Iran. Its watershed is 1,630 km², its length is 78 km, and its width is about 50–60 m at its mouth down to 100 m upstream. Its average discharge is 16 m³/s. The river receives abundant water from snowmelt and rainfall. Particularly in winter and when a lot of precipitation has fallen in the mountains, it is a full-flowing river. In its upstream part, as far as Barfrush City, it is reminiscent of a real mountain river with cliffed banks rushing down steep slopes. More downstream, it emerges onto a plain and flows into the sea, forming a wide alluvial fan and a vast, U-shaped bar composed of its own alluvial deposits. Spring floods occur in March–April when ships run all the way to Babol City. Sturgeon and other fish run into the river for spawning.

Babolsar (formerly Mashadener, translated as “*Mashhad’s head*”) – once one of the major international trading ports in the Caspian littoral of Iran, from here the road to Mashhad starts. The city is located 23 km from the Babol River mouth on the right bank, 20 km northward of Babol City, in Mazandaran Province. Its area is approximately 40 km², and its population is estimated at 132 thou (2006). The city is located 4 km from the port. Soap factories, tobacco processors, and oil refineries are found here. Fisheries are found on the left bank of the Babol River. Nearby is an excellent resort with a beautiful hotel complex on the seaside.

Backs – back components of great sturgeon, sturgeon, and stellate sturgeon used for the preparation of hung balyks (balyk – smoked or sun–dried flesh of sturgeons or large salmons).

Baer’s Hills – a unique relief form that appeared after Caspian recess due to wind actions. These are parallel, nearly latitudinally striking ridges and hills in

the Caspian Lowland between the Kuma and Emba River mouths and also from Astrakhan southward. Their height usually varies from 3 to 20 m, their length is to 2 km, and their width is 200–300 m, with an average spacing between ridges of 1–2 km. B.H. are composed of quartz sands and small rounded chips of solid brown clays and are compacted with clay material. Quite often their tops are broken and deflated. In the Volga delta, B.H. has been used for a long time by the local population in construction of settlements. One of these, “Devil’s town”, is a natural and historical place of interest. Some parts of Astrakhan are also located on such hills. They received their name in honor of the outstanding natural scientist Academician K.M. Baer.

Bagless Beach Seine – light net for fishing in shallow channels on the Volga.

Baida – a fishing sailboat equipped with a net, drag seine, etc. Its length is 6 or 7 m, its width is 1.7–2 m, and its draft is about 0.5 m.

Bakhr – in Tajik, Uzbek, and Turkmen it means “sea, ocean”; in Persian “bakhr, bekrh”; in Arabic “bakhr,” meaning “sea, big river”; in Turkmen it is traditionally said to be “Bakhr hazar” – the Khazar Sea (Caspian Sea).

“Bakhr Al-Khazar” – meaning “Khazar Sea,” it is a historical and geographical article describing the Caspian Sea and included into the “Encyclopedia of Islam” of V.V. Bartold. It was published in the book of V.V. Bartold “Papers on Historical Geography” (2002).

Bakhrul-Khazar, Bakhru-Khazar – name of the Caspian Sea on the map of Mokhammad-ibn-Ali-ibn-Akhmed al Sharfi (1601).

Bakhsh – a type of administrative division of the Islamic Republic of Iran. In 1998 there were 498 of them. The official Governor of a bakhsh is called the bakhshadar.

Bakhtemir, Bakhtemir System – the largest (longest, meandering and deep-water) of the arms and western tributary of the Volga delta. It is navigable. The mouth of B. is connected with the Volga-Caspian canal. The B. arm originates downstream at the place where the Old Volga arm branches off from the Volga main channel. It is the main river part of this canal in a stretch from the village of Krasnye Barrikady to the mouth, a distance of 96 km. Many settlements are scattered on the banks of B., the largest of which are Olya, Fedorovka, Trudfront, Sergievskaya, Ikryanoye, Bakhtemir, and Krasnye Barrikady. The main channel is an extension of the Volga downstream to the delta apex – the B. arm – while upstream part of the Volga-Caspian canal may be considered the main arm of the Volga delta, being the continuation of the canal in the mouth seaside.

Bakhtemir Bank – located approximately 20 km eastward of the Suyutkina Kosa (Spit) Cape in the Astrakhan Region. It extends over a rather large area and has

dangerous currents for sailing along the shore between the Chechen and Tyuleny islands.

Bakinka – a transport and fishing sailboat with a schooner-type rigging. The shell of the boat is impregnated not with tar but with oil. Its length is 12–18 m, and it can take 8–10 people on board. It is named after the place of its construction, Baku.

Bakinsky Ushi – a mountain located 8.5 km to the west and northwest of the Puta Cape in the Caspian coastal section from the Baku Bay to the Amet Cape, Azerbaijan. This is the highest and most distinguished mountain among the south-eastern spurs of the Caucasus. It has two peaks: Takhtalyksky, the southern peak (al. 412 (384) m), and Kergez, the northern (al. 424 (396) m).

Baklany Kamen – a small stony island rising slightly out of the water. It lies 15 km to the north-northeast of the Shikhova Cape on the Apsheron Peninsula in Azerbaijan.

Baku (Baki) (from Persian *Baakube (or Baadkube)* meaning “the city where wind is blowing”; from Lak “a hill, small mountain”) – One of the etymological versions of the Baku name is connected with its placename. During the Sasanide ruling B. was called Bagavan. The Arab name “Baku” appeared in the eighth century. The Arab geographers used such names as Baka, Babika, Bakiye (Masudi), Bakuye (Istakhri), Bakuey (Kazvini), Bokuye (Bakuvi) and others. As V.V. Bartold wrote, “Interpretation of the name presently adopted in Baku and based possibly on the people’s etymology referred most likely to the much later time as well as the legends about foundation the city by Khosroy Anushirvan.”

B. has the best harbor on the Caspian coast and is the capital (from 1920) of Azerbaijan. The city is situated like an amphitheatre with terraced neighborhoods descending towards Baku Bay at the south of the Apsheron Peninsula. It was founded in the fifth century, when oil and salt were transported from the city and its desert surroundings. Arab geographers of the ninth century described two Baku oil sources, one of which produced up to 200 barrels a day. Via the Baku port they traded oil for silk and spices from the Far East. For centuries, B. belonged to the Arabian (Abbas’) caliphate, and in the second half of the twelfth century it was the political center of the Shirvan state. In the late fifteenth to early sixteenth centuries, the Baku fortress was one of the strongest in Transcaucasia, and from 1540, it was included into the Safavis state. From the 1580s, it was ruled by Turkey, until, in 1604, troops of Persian Shah Abbas I conquered it once again.

During a march to the Caspian region in 1722, Peter I wrote in his order to General Matyushkin, “Go to Baku and with God’s help do your best to conquer this city that is the key to our whole campaign . . . and defend this place with all your might.” The city was conquered by the Russian troops, but in 1735 it was returned to Persia. From 1747, it was the capital of the Baku Khanate. Then, in 1806, it was joined to Russia, where, until the 1840 s, it was the district city of the Caspian region, then the Shemakhinsky Province. From 1859, it was the capital of the Baku Province.

Rapid growth started in the 1870s with the development of the oil industry. Oil extraction increased from 588.9 thou poods (1 pood equals 16.38 kg) in 1864 to 4 million poods in 1873 to 673 million poods in 1901, when it accounted for 95% of oil production in Russia and about 50% of world production. The Nobel Brothers Partnership, the oil production and trade partnerships of the Mirzoyev Brothers, S.M. Shabaev, A.I. Mantashev, Rothschild and others all operated in B. In 1873, B. numbered 12 oil companies, but by 1899 the number reached more than 60, including 15 large ones. In 1878–1888, an oil pipeline connecting the Balakhansky extraction area with the oil refineries in the city was constructed. In 1889, there were 26 pipelines in Baku to supply oil to refineries and warehouses, and in 1897–1907, the oil pipeline Baku-Batumi was completed. In 1899 there were 100 oil refineries in B. In 1905, the editor of the Journal “Petroleum World” (USA), James Dodds, wrote, “If oil is the queen, Baku is its throne.” Other industry in B. included metal-working, tobacco, and flour milling. In 1883, traffic was opened along the railroad Baku–Tiflis, and in 1899 the Baku–Derbent line was completed. In the period beginning in 1859, a port was constructed and a tanker fleet was built. From the Baku port, salt, rice, fruits, and other products were supplied to other ports in Russia, mostly Astrakhan. B. was also a port for trading with Persia and other countries, and from the late nineteenth century, B. was one of the centers of labor movement in Transcaucasia, and in 1913–1914, B. was engulfed by general strikes.

During World War I detachments in reserve of the Caucasian Army were dislocated here.

From 1918 to 1920, B. was the capital of Azerbaijan Republic; from 1920 to 1991, of the Azerbaijan SSR; and from 1991, of the Azerbaijan Republic. The population is 1.9 millions (2008).

B. is a railroad junction and a port on the Caspian Sea. It has ferry traffic connecting it with ports on the eastern coast of the Caspian (Turkmenbashi, Aktau). Since 1967 it has a metro. The industry: oil and gas extraction, oil refining, petrochemical, chemical, machine-building (oil equipment, electrical engineering and radioelectronic devices, ship repair and others), light, food and of construction materials. B. is a scientific and cultural center of the country: the National Academy of Sciences, 11 educational institutes (3 universities), 7 theatres, and 28 museums are located there. Among the ancient monuments worth mentioning are the fortress of Icheri-Shekher, a state historical and architectural preserve; the Palace of Shirvanshahs; the Synyk-Kala mosque (eleventh century); the Maiden Tower; and Bailov stones (thirteenth century).

B. is a green city, and it should be mentioned that nearly all parks, including the famous embankment boulevard, are artificially planted. The soils of the Apsheron Peninsula are mostly arid, thin and low-fertile, thus tons of fertile soil was needed to create these parks. In the 1880s, the chief of Baku city, supported by rich entrepreneurs, ordered all vessels coming to into Baku Bay from Persia to bring fertile soil. In fact, it was a kind of a duty or tax for utilization of the bay area. Rather quickly, the needed quantity of soil was accumulated for creation of parks and gardens of which B. now boasts.

B. is a member of the Union of World Energy Cities.



Baku city (<http://rizer001gmailcom.blogspot.com/2008/02/25-50.html>)

Baku Archipelago – a group of islands located near the Caspian coast south of the Apsheron Peninsula in Azerbaijan. It includes Bulla, Svinoy, Duvanny, Glinyanyi, Los', Oblivnoy, Kurinsky Kamen and Kamen Ignatiya islands as well as Savenko, Bezymyannaya, Persiyanin, Kumani, Pogorelaya Plita, Kornilova-Pavlova, Makarova, Kurinskaya, Golovacheva and other banks. The area of B.A. is about 10 thou km², and its length is about 200 km. Its maximum width is about 50 km. To the southwest, the depth of the Caspian Sea in the B.A. area increases, the islands turning into banks and then disappearing completely. All islands and banks of the archipelago are of volcanic origin. Some islands are affected by frequent volcanic eruptions that change their relief characteristics.

Baku Basin – a slightly saline basin from the early Pleistocene located where the modern Caspian Sea is. It was of a somewhat larger size than the modern sea.

Baku Bay – name of Baku Harbor on the first printed map prepared by F.I. Soimonov in 1719. The map heading read, “Flat picture of the Caspian Sea from the Volga River mouth, Yarkovsky channel to the Kura River mouth.” There is also a hand drawn map of Baku Harbor from 1726 named, “Picture of Baku Harbor, depths in sazhen.”

Baku Commune – the literary name of the Soviet Power in Baku and some parts of the Azerbaijan territory used from April to July, 1918. The government consisted of Bolsheviks and leftist socialist revolutionaries (Easers). The chairman of the Council of the People's Commissars was S.G. Shaumyan. B.C. was liquidated by Turkish and British troops. Twenty six leaders, the so-called “Baku Commissars,” among them S.G. Shaumyan, M.A. Azizbekov, P.A. Djaparidze, I.G. Fioletov, were arrested by the government of the “Central Caspian Dictatorship” and executed by firing squad on September 20, 1918 in Zakaspyi, Turkmenistan, where there is now a memorial.

Baku Harbor – cuts into the southern shore of the Apsheron Peninsula between Shikhov and Sultan capes in Azerbaijan. Its form is reminiscent of a sickle. By its geographical location, size, and depth, it is the major bay in the Caspian Sea. The capital of Azerbaijan, Baku, rises around it like an amphitheatre. B.H. is sheltered from all winds save southern. Its shores are steep. On the western shore, mountain offspurs descend near the sea. Here, oil industry facilities are found. In the west of the bay is the stony Karavan-Sarai Island with heights up to 2.0 m. Lying in the shallow area of the bay are Nargen, Plita, Vulf, Peschany, and Khanlar islands, which form the northern group of the Baku Archipelago.

Russian nautical surveyor F.I. Soimonov wrote in 1723: “Of the mentioned Baku Bay, 2 verst (1 verst equals to 3,500 feet) southward of Baku City at a depth of 4 sazhen (1 sazhen equals to 2.13 m) is found a stone structure – a wall with a tower. And although this structure is ruined, its remnants can be seen rising above the water. They say that in the ancient times this structure was on land and was a guest yard.” The former fortifications are assumed to have been flooded when the sea level rose.

In the early eighteenth century in B.B., the ruins of a mysterious structure were found near the Bailov Cape. I. Djafar-zade (1939–1940) determined that the ruins on the bay’s bottom belonged to an ancient temple of fire-worshippers (caravan-sarai) dated back to years 1234–1235. He concluded that the Caspian Sea level in the period of the temple construction was 2 m lower than at present. The first description of B.H. is found in a pilot chart prepared by F.I. Soimonov in 1731.

The appearance of oil refineries and oil infrastructure on the B.H. shores led to pollution of the bay with untreated wastewaters discharged from these enterprises and also sewerage from growing Baku City. As a result, B.H. turned into a “dead zone.” Purification of the bay waters is a priority project in the Republic.

Baku Horizon – the lower formation of the Pleistocene in the Caspian depression. It occurs in the Apsheron formation (layers) and is overlain by the Khazarsky layers. B.H. deposits are composed of (from bottom to top): sea sands with *Didacna Mudis Nal.*, *D. Catillus*, *Monodacna caspia*, *Dreissensia polymorpha* and others; freshwater and continental clays; and red-brown clays with soil-formation features. Clays in B.H. compose the lower part of the so-called syrt deposits. The B.H. is the same as the deposits of the Baku basin.

Baku International Merchant Seaport – one of the major ports in the former USSR on the Caspian Sea, and since 1991, the only port in the Azerbaijan Republic through which trade relations with all Caspian countries are maintained. This port also ensures exit via the Volga-Don and Volga-Baltic canals to the world markets. It is located in Baku Harbor. As late as the 1860s, Russia still used this port for active trading with the Far East. This port acquired special importance in the 1870s–1880s when, as a result of soaring oil production, Azerbaijan started transporting oil cargo over the sea. The port includes the main cargo terminal, the container terminal, the oil terminal Dyubendy, the ferry terminal, and the passenger terminal. The port is

capable of handling up to 10 million tons of liquid cargo and 9–10 million tons of general cargo annually.

The main cargo terminal is located in the center of Baku and consists of 6 piers with heavy-duty gantry cranes with a total length of 866 m. The water depth near them is 7 m. The container terminal capacity is about 15 thousand containers a year, including 40 foot containers. The ferry terminal services the routes Baku–Turkmenbashi–Baku, Baku–Aktau–Baku, and Baku–Iranian ports–Baku. The passenger terminal comprises 3 piers with a total length of 340 m and is designed for berthing passenger ships from Caspian countries. The port fleet includes 20 ships, including tug boats, towing vessels, vessels gathering bilge water, spill containment vessels, pilot and fire boats, and a crane ship.

Baku Khanate – a state located on the territory of present-day Azerbaijan. It was founded in the 1740s on the Apsheron Peninsula by Mirza Muhammad Khan, one of the confidants of Iranian Nadirshah. The capital was Baku. During the Russian-Persian War of 1804–1813, B.K. was occupied by Russian troops, and in 1813, in accordance with the Gyulistan Peace Treaty, it was incorporated into the Russian Empire as a district of the Caspian region.

Baku Marine Observatory – was established in 1922 by the Department for Shipping Security on the Caspian Sea to organize an in-depth and comprehensive study of the physiographical and hydrographic conditions of the Caspian Sea. The study included investigations in marine meteorology, aerology, sea hydrology, forecasting, and Earth's magnetism. For this purpose, a network of hydrometeorological stations and ice posts was organized, and the Weather and Time Service Bureau was created at the Observatory.

Baku Nautical College – an educational establishment for training mid-level specialists for sea vessels. Nautical education was initiated in Azerbaijan in 1881 when the first nautical classes were formed in Baku. In 1902, the Baku Nautical Classes were transformed into the Baku Long-Distance Sailing College, where students studied for 3 years. In 1920, the Water Transport College was established on its basis, and in 1924, it was renamed the Waterways College. At last, in 1930, it was reorganized as the Baku Maritime College. In March 1944, it was named Baku Nautical College.

Baku Nord – the local northern cold strong wind blowing in the Apsheron region. Its velocity is often from 20 to 40 m/s. It brings great quantities of dust to the region.

Baku – Tbilisi – Ceyhan (BTC) – a 1,730 km long oil pipeline. It was designed to transit no less than 50 million tons of oil a year over 40 years. In 1993, an agreement on construction of BTC was signed between Azerbaijan and Turkey in Ankara, Turkey. This was followed by many years of negotiations, and at last, on October 29, 1998, the Ankara Declaration on Caspian and Central Asian Oil Transit to the World Markets along the Baku-Tbilisi-Ceyhan Pipeline was signed by the Presidents of Azerbaijan, Georgia, Kazakhstan, Turkey, and Uzbekistan. This Declaration was approved by the US energy minister. On November 18, 1999 in

Istanbul (Turkey), the Presidents of Azerbaijan, Turkmenistan, Georgia and Turkey signed the Intergovernmental Declaration on the Principles of the Trans-Caspian Pipeline Construction that was approved by US President Bill Clinton. Then, on October 19, 2000 in Turkey, four agreements on BTC construction and further operation were signed. The consortium on the oil pipeline construction included British Petroleum (BP), the project operator, as well as UNOCAL (USA), Statoil (Norway), Turkish Petroleum (Turkey), ENI (Italy), TotalEiFina (France), Itochi Oil (Japan), Delta Hess (Saudi Arabia and USA), and SOCAR (Azerbaijan). The value of the project is US\$ 2.9 billion. The ceremony for startup of construction was held at the Sangachal terminal in Azerbaijan on September 18, 2002. The BTC construction was completed in 2006.



Baku-Tbilisi-Ceyhan pipeline (<http://www.runtogold.com/images/Baku-Tbilisi-ceyhan-Pipeline.png>)

Baku Oil Region – the major oil region in the Azerbaijan Republic. It is located on the Apsheron Peninsular and extends over the nearby areas. Oil deposits are confined to the Tertiary (Upper and Middle Pliocene) formations. The productive series at from 1,000 to 3,000 m thick is composed of sands, sandstones, aleurolites, and clays. In some oilfields, up to 40 oil-bearing formations are present in the productive series. Oil deposits are associated with the anticlinal folds extending mostly from the northwest to the southeast.

Oil was found on the Apsheron in the seventh to eighth centuries, when it was mostly used for heating, lighting, and medicinal purposes. The oil sources in Baku were first mentioned in Arabic treatises in the tenth century. At that time, oil was extracted from pits dug 10–12 m deep. In 1594, a pit 35 m deep was dug manually on the Apsheron. In 1798–1830, for the first time in the world, oil was extracted from the shelf through a pit dug in the Bibi-Heybat Bay near Baku. Development of

the oil industry gained momentum only at the end of the nineteenth century. In 1873, the first powerful oil flow spouted from a depth of about 35 m near the settlement of Balakhany. After this, Russian engineer Semyonov initiated intensive drilling works in Bibi-Heybat where in 1847 the world's first oil well was drilled. Dug pits were used until 1872.

In 1859, Russian businessmen V.A. Kokorev and P.I. Gubonin built the first refinery for paraffin and kerosene production near the settlement of Surakhany. Three years later this oil refinery produced 1,638 thou kg of paraffin. In 1850, the world produced 300 t of oil, but by 1881, oil production had increased to 4.4 million tons, and by in 1891 the number was 22.5 million tons of which 9.5 million tons was extracted in the USA and 11.4 million tons in Russia. Ninety five percentage of this latter amount was supplied by Azerbaijan. In the late nineteenth century, Baku becomes the “capital of black gold.” In 1900, there were already more than 3,000 oil wells in the Baku oil region of which 2,000 wells supplied oil for industrial purposes. The major contribution in the development of Baku oil was made by the Nobel Brothers, who in 1879 established the oil company, “Nobel Brother’s Partnership”. Ludwig Nobel, the head of this company, was a gifted engineer and organizer who developed and introduced many innovations for improvement of the technology of oil production, transportation, and processing, including the first tanker, the first railway tank, the first oil pipelines, the first oil storage facility, etc.

From 1897 to 1906, the construction of 833 km long Baku-Batumi kerosene pipeline was completed. The diameter of the pipes was 200 mm. The pipeline was serviced by 16 pumping plants. Still earlier, in 1883, the railroad Baku–Tbilissi was constructed, making it possible to carry oil in railway tankers. In 1880, a 26 km long railroad was constructed that linked Baku with several oilfields. In the early twentieth century, Baku became the world’s leader in oil refining, producing 11.5 million tons of oil a year, and in 1910, more than 60% of the local oilfields were taken under control by three main trusts: “Royal Dutch Shell,” “The Nobel Brothers Oil Production Partnership,” and the “Russian Oil Company” with headquarters in London.

During the Soviet times, the oil industry was restored, rehabilitated, and equipped anew. New oilfields were discovered, such as Karachukhursky, Zykhsy, Kalinsky, Putinsky, Lokbatansky, Buzovninsky and Mashtaginsky. The major oilfields in the Apsheron group are Balakhano-Subuchinsky-Romaninsky, Surakhansky, Karachukhursky (southward of the Surakhany station), Buzovny-Mashtaginsky, Binagadinsky, Bibi-Heybat (to the southwest of Baku), Kalinsky (in the east of the peninsula), and the oilfield on the Artyom Island. Prospected were also the oilfields in the Circum-Caspian Lowlands near Siazan and in the Circum-Kura Lowland (Kirovobad Region, Naftalan, Mir-Bashir, Alyat and others), where the largest and most anticipated was the Ali-Bairamly Region (Kyurovdag, Mishovdag oilfields and others). In 1925, development of oil deposits in the Caspian seabed was initiated on an experimental basis. On the initiative of S.M. Kirov, an oil well was drilled from the artificial island in the Ilyich Bay (oil availability in this area was proved by D.V. Golubyatnikov). The scientific hypotheses linking the mud volcanoes and oilfields discovered by Russian scientist Academician I.M. Gubkin

triggered this development of offshore oilfields. In 1935, he suggested exploring in the sea, a suggestion that later proved sagacious when major reserves were discovered.

In 1925–1926, oil production reached 6.8 million tons. Just before World War II (1941), Azerbaijan maximized oil production at 23.5 million tons, which was 70% of the oil production of the USSR. During the war, oil production dropped, and in 1945 it was only at 11.5 million tons. Immediately after the war, attention was focused on the Caspian shelf, and in 1949, sea oil was for the first time produced on commercial scales in the oilfield Neftyaneye Kamni. Among the sea oilfields the largest are Gyurgyany-more (to the southeast of the Artyom Island), Zhiloy Island, and the Baku Bay area (Zykh, Vulf, Nargen, Bailovsky Spit, Shikhova Spit, Peschany Island, Ilyich Bay and others).

In the late 1960s, the share of Azerbaijan's production in terms of national production declined due to quick growth of oil production in the Volgo-Ural oil region (the so-called "second Baku"). In the early 1970s, a second Caspian off-shore oilfield was put into operation. It extended for 40 km from Sangachaly Cape in the southwest of the Apsheron Peninsula to the Duvany and Bulla islands. By 1975, two-thirds of Azerbaijan oil was supplied by off-shore oilfields.

In spite of this off-shore oilfield development, the Baku oil region was unable to compensate for the drop of oil production at on-shore oilfields that had been depleted by this time. Until the late 1970s–early 1980s, oil prospecting and production on the Caspian were carried to depths of 30–40 m. Then, in the mid-1980s, thanks to the appearance of semi-submersible floating drilling platforms, oil extraction to a depth of 200 m began. As a result, in 1979 such oilfields as Gyuneshli, followed by Chirag (1985), Azeri (1988), and Kyapaz (1989) were discovered; however, during Soviet times, commercial oil extraction from these depths was not planned for earlier than the twenty-first century.

After Azerbaijan became an independent state, its oil industry was revived anew. Today, 51 on-shore and offshore oil deposits with more than 10,500 wells are operated in the Republic. For nearly 120 years of its history, Azerbaijan extracted 1.325 billion tons of oil, and at present, 10 million tons of oil and 7 billion cubic meter of gas are produced there annually. Oil refineries are located in Baku, the center of the Baku oil region. They have large cracking and vacuum units enabling them to increase the oil processing and produce more than 100 kinds of oil products. The oil production and refining industry is a basis for development of many other industries, the greater part of which are concentrated in Baku or nearby. Also developed are the machine-building industry (Baku) servicing mainly the oil industry of Azerbaijan; the chemical industry, including a synthetic rubber plant that uses oil gases in Sumgait; a plant manufacturing sulfuric acid used in oil product refining; a soda plant producing caustic soda and chemicals for oil refineries as well as oxygen and carbide. All of these plants are located in Baku. Plants manufacturing healing ointments, naphthalene, and other medicines have also been developed. A pipe mill is located in Sumgait, and plants producing Portland cement and oil-well cement, soot, mud weighting materials, and others is in Karadag.

All industrial centers in the Baku region (Buzovny, Mardakyan, Lokbatan, Surakhany, Sumgait, Artyom Island and others) are connected with Baku by roads, railroads, and the sea. Oil is transported via pipelines Baku–Supsa and Baku–Novorossiysk, and also by rail to the Caspian Sea. One of the largest deposits, the Karadag gas condensate field, is found in the southwestern part of the Apsheron Peninsula. Today, Azerbaijan has 350 ships servicing the oil industry as well as tankers, cranes, and vessels engaged in construction of underwater pipelines.

Baku Province – formed in 1846 as Shemakhinsky Province. In 1859, Shemakha was destroyed in an earthquake, and all provincial authorities were transferred to Baku. The province got its present name then. In 1860, the Kubinsky ouezd (district) was included into the province, and in 1868, the Nukhinsky and Shushinsky districts were affiliated to the Yelizavetpolsky Province. Thus, B.P. comprised the following districts: Bakinsky, Geokchaisky, Djevatsky, Kubinsky, Lenkoransky, and Shemakhinsky. The area of B.P. was 34.4 thou sq.verst (1879), and the population was 789.6 thou people.

Until the 1870s, B.P. was an agrarian province of the Trans-Caucasus where horticulture and viniculture were developed. From the late nineteenth century, cotton growing and cattle breeding were also pursued here.

From the 1870s, the Baku region became Russia’s major oil production region. The oilfields were owned mostly by the “Russian General Oil Corporation,” the British-Dutch Trust “Shell”, “Nobel Brothers Partnership” and the “Financial Oil Corporation”. By the end of the nineteenth century, 209 oilfields and more than 930 boreholes were found on the B.P. territory, their numbers increasing to over 1,600 by 1906–1908. At the same time, B.P. accommodated over 1,200 industrial enterprises that were mostly concentrated in the Baku industrial region, including oil refining, metalworking, dyeing, silk-reeling, winemaking, and others. The production of salt and fisheries were also developed here. The construction of the Trans-Caucasus railroad between 1883 and 1900 facilitated further economic growth in the province. After the 1880s, B.P. witnessed spontaneous worker strikes, including strikes on tobacco factories and fishworks in Baku and others between 1892 and 1896. 1905–1907 was a period of mass meetings, political strikes, and demonstrations of peasants and soldiers of the Baku garrison.

Baku Sea – one of the names of the Caspian Sea used by European authors in the thirteenth to fourteenth centuries. In particular, Ambrogio Contarini wrote the following in his work, “Travel to Persia” (1474): “The city of Derbent is located on the Baku Sea (it is also called Caspian).”

Baku Transgression (for Baku City) – early Quaternary transgression (400–500 thousand years ago) of the brackish Caspian Sea, which was larger in size than at present. The thickness of deposits was around 30–60 m. It occurred in two phases.

Balakhan Relics – (1) *freshwater* – they live not only in the Caspian Sea rivers, but in the Aral, Issyk-Kul, and Balkhash. The Volga is populated with more than 50 species of invertebrate, the Ural with about 20, the Terek with 8, the Kura and

Araks with 7, and the Sefidrud with 5 species. Among them there are several species with twin brackish species. The freshwater needlefish, aterina and bullhead spawn in the Volga and Ural. The Turkish freshwater shrimp live in the Araks and Upper Kura. Freshwater mollusks live in the Volga and Ural, Sefidrud, Kura, and Araks. In addition, in the Caspian rivers, ordinary sprat and several species of bullheads live permanently, while Volga herring, black-backed herring, and Caspian shad run here to spawn. Their intrusion into rivers may be traced to the presence of polymorphic zebra mussel shells in the Sokolsky and Chistopolsky horizons of the Kinel geological suite of the Volga and synchronous deposits in Western Kazakhstan and Turkmenia.

(2) *brackish* – live in the Caspian Sea, Aral Sea, saline lakes of Uzboy, and the Circum-Caspian Lowland. They spawn at a temperature of 10–35°C in nearly fresh waters (up to 2‰) and in waters with salinity up to 60‰. They include Caspian foraminifer ammonia, gastropods, crustaceans such as Aral freshwater shrimp and one species of ostracods Cyprideis; and fish such as Caspian aterina, Caspian needlefish, and Caspian bullhead. The difference in the structure of parasite fauna of the Caspian and Black Sea aterins and bullheads is a result of their independent development over nearly 6.5 million years. Gastropods live in brine from which gypsum is deposited (at a salinity of about 130‰). The predecessors of the Balakhan relics have been known since the Sarmatian or Pontian time, and they all they originated from tropical and subtropical organisms populating the Indian and Atlantic oceans.

Balakhany – an urban settlement in the Azerbaijan Republic located on the Apsheron Peninsula 14 km to the northeast of Baku and connected by an electric railroad. The population is 25 thou (1994). Oilfields from the nineteenth century are located here.

Balkanabat (formerly Nebit-Dag) – the administrative center of the Balkansky velajat in Turkmenistan. It was founded in 1933 as a worker’s settlement (Neftehdag or “oil mountain”). This name is created from the Russian *neft*, meaning oil, and Turkmen *dag*, meaning mountain. In 1946, when it was transformed into a city, its name was changed to the national Nebit-Dag, where *nebit* means oil in Turkmen. In 1991, when the Krasnovodsk Region was renamed into Balkansky velajat, Nebit-Dag was given the name B. The establishment and development of this city is connected with the oil industry. Here, a plant for repairing oil equipment, a gas-fueled power plant, an iodine-bromine plant, a carpet factory, and others are located.

Balkansky Velajat (Balkan velajat) – Until 1991, it was called the Krasnovodsk Region of Turkmenistan. The name was given for the Greater and Lesser Balkhan ridges. B.V. is composed of the western part of Turkmenistan. It borders with the Mangistau Region of the Kazakhstan Republic and the Republic of Karakalpakstan in Uzbekistan to the north; with the Tashauz and Akhalsky velajats of Turkmenistan to the northeast and east; and with Iran to the south. In the west, it borders the Caspian Sea. B.V. extends over the whole Caspian coast of Turkmenistan and its

coastal zone. Etrap and Turkmenbashi, the territories controlled by khyakimlik (administrative bodies) of the cities of Khazar (formerly Cheleken) and Balkanbat (formerly Nebit-Dag) and the Esenguly etrap, extend all the way to the Caspian Sea.

The area of B.V. is 138.5 thou km², covering 29% of the territory of Turkmenistan. The population is 412 thou, or 9% of the country's population. The center of the velajat is Balkanabat, and there are 4 more large cities in B.V.: Turkmenbashi, Khazar, Kazandjik, and Kyzyl-Arbat.

The terrain of the velajat is diverse, including the western spurs of the Kopetdag Mountains; the Greater and Lesser Balkhan ridges; the Ustyurt chinks; the valleys of the Atrek, the Sumbara and Chendira rivers; the Krasnovodsk Plateau; the piedmont plain of the Western Kopetdag; the Messeriyansky, Kyzyl-Kaya, Tuarkyra plains; the Circum-Caspian Lowland; sand deserts of Kyzylkum and Chilmamedkum; and solonchaks (the major – Balkhansky). The greater part of the territory is occupied by the West-Turkmenian Lowland, called the Circum-Caspian Lowland on the Caspian coast and characterized by a slight incline from the east to the west. Its absolute elevations vary from 100 to 200 m over ocean level in the Kopetdag piedmont areas to 28 m below ocean level on the Caspian coast. Not far from the northernmost end of the Kara-Bogaz-Gol Bay is the lowest point of the velajat, the Chagalosor hollow, the bottom of which is 45 m below ocean level. The territory of B.V. is composed of Mesozoic, Cenozoic, and Quaternary deposits containing various minerals. In the Western Kopetdag are found deposits of barite and viterite; considerable reserves of zinc, lead, copper, mercury; chemical raw materials such as phosphates (Arpaklen), iodine-bromine waters (Cheleken Peninsula, Boyadag, Mondjukly, Gograndag, Karadashly, Koturdepe and Kumdag), table salt (Baba-Khodja, Kuuli-Mayak, Karashor, Western Uzboy); brines of the Kara-Bogaz-Gol Bay – mirabilite – rich in the Glauber's salt, magnesium, bromine, iodine and potassium. B.V. possesses great deposits of building stone "gyush" (Akdash, Omar-Ata), bentonite (Oglandy), black coal (Yagman), and brown coal (Chaiyrly), curative mud (Mollakara, Akpatlavuk, Gekpatlavuk, Chekishler), mineral waters (Parkhai, Akchagyl), and others. The oil-bearing formations are confined to deposits of the red-colored series of the Akchagyl and Apsheron horizons. The principal natural wealth is oil and natural and associated gas the resources for which are concentrated in the Koturdepe, Barsagelmes, Cheleken, Vyshka, Okarem, Kumdag, and Kamyshlydja Regions and in the Caspian Sea (Lam, Livanova, Gubkin, Zhdanova banks and others). The oils here are low-sulfur (0.15–0.35%), light (specific weight 0.81–0.87), and the paraffin content is up to 10%.

The mountains (Kopetdag, Kyurendag and others) running in the south of the velajat are geologically young and seismically active (the Krasnovodsk earthquake in 1895 and the Kazandjisky earthquake in 1946 are two notable examples).

The climate here is sharply continental, arid and hot, with a long summer-autumn season, a cold winter, low precipitations, and low relative air humidity. The dry subtropical climate dominates the Atrek and Sumbar river valleys. In the areas near the Caspian Sea, the weather is less hot in summer and the frosts are less severe in winter. The average annual air temperature in Turkmenbashi is 15.8°C, in Cheleken 14.9°C, and in Kyzyl-Atrek 17.1°C. The mean monthly temperature in

July in Turkmenbashi and Esenguly is 28.7°C and in Kyzyl-Atrek is 28.9°C, while the mean monthly temperature in January is 2.4°C in Turkmenbashi and 4.8°C in Kyzyl-Atrek. The average annual quantity of precipitation in the coastal zone is 100–120 mm, and the central desert and northern regions receive less precipitation.

B.V. has scarce water resources. Apart from the Atrek River (with the tributaries Sumbar and Chendir of 635 km length, of which 135 km are in Turkmenistan), the Yaskhansky freshwater lens, and shallow mountain rivers (Gochsu, Zavsu, Purnuvarsu and others) there is no permanent surface runoff. Many regions have salt lakes. Dry channels of mudflows, the ancient channel of the Uzboy River, and others are also traceable. Fresh and slightly saline (to 3 g/l) ground waters are a very important water source for economic development here. A considerable part of the groundwater is extracted by industrial water intakes, such as Kazandjiksky, Balkanabatsky, Bala-Ishemsky, Yaskhansky, Karakidjasky, providing annually up to 30 million cubic meter of fresh water of various quality. To meet the needs of fresh water for the population and economy of B.V., seawater desalinization plants operate in Esenguly, Bekdash, and Turkmenbashi.

Soils are variegated. In the mountain regions dark gray, mountain-meadow soils and sierozems are widespread. The plains, in particular near Kopetdag, Messeriansky, the piedmont plains of the Greater and Lesser Balkhans, and the southern regions of the Sarykamysh are covered with takyr, takyr-like, gray, gray-brown, and desert soils. Solonchaks and desert soils extend over great territories (in the Atrek basin, the Circum-Caspian Lowland, Krasnovodsk Plateau, Lower Uzboy). Herbaceous ephemeral vegetation (annual grasses and ephemeroïds) and shrubs (saxaul, cherkez, candym) dominate the region. The territory of Kopetdag is covered with broad-leaved and coniferous forests and shrubs; the Greater and Lesser Balkhans with semishrubs; and the Atrek, Sumbar, and Chendir valleys with steppe vegetation. In populated areas, fruit and mulberry trees and grapes are grown, while subtropical regions see nuts, pomegranates, figs, olives, and other trees.

Many animals are found in this region, including rodents (gophers, rats), reptiles (poisonous snakes (blunt-nosed vipers, cobras), water snakes, and monitors), artiodactyls (Persian gazelles, argali, boars), carnivores (wolf, fox, corsac fox, jackal, linx), insects, and others. The Caspian Sea is populated with seals and more than 80 species of fish, 50% of which are of commercial significance, the most valuable of which are sturgeon. The region abounds in migratory and hibernating birds: gray geese, ducks, sandpipers, herons, flamingos, and others. In 1933, the Esengulyisky ornithological preserve was established for protection of migratory and nestling birds.

Before the 1917 revolution, the industry here was represented mostly by primitive extraction of oil on Cheleken, locomotive repair works in Kyzyl-Arbat, ship repair yards in Krasnovodsk, and other small enterprises. In Soviet times, heavy industry was developed here, including plants for processing chemical raw materials, oil, and gas were constructed. In the first years of Soviet power, geological prospecting of oil, gas, and other resources was carried out actively. The opening and operation of oil and gas fields in Kumdag (1948), on the Cheleken Island (1950), in Koturdepe (1956), Barsa-Gelmes (1962), Okarem (1963) provided an impetus for development of oil and gas production. The main industries here are fuel, food, power generation,

production of construction materials, machine-building, chemical and light industry. B.V. provides 100% of extraction of oil, bentonite, Glauber's and table salt as well as production of iodine, bromine, canned fish; 21.8% of the power generation; and 98.2% of the fish catch of Turkmenistan.

Oil is extracted in Cheleken, Kumdag, Vyshka, Koturdepe, Barsa-Gelmes, Okarem, and in the Caspian. Some parts of the extracted oil are supplied to the Turkmenbashi refinery for processing. The power industry is represented by two thermal power plants in Turkmenbashi and by the Balkanabatsky hydropower plant that was the first to change to gas fuel. The chemical industry has developed on the basis of the local raw materials: a plant producing technological carbon in Cheleken uses Koturdepe associated gas, and the iodine-bromine plants in Balkanabat and Khazar uses iodine-bromine waters; a plant in "Karabogazsulfat" in Bekdash manufacturing sodium sulfate, epsomite and bischofite uses the mineral raw materials of Kara-Bogaz-Gol. Machine-building and metalworking industries are represented by a railway car repair plant in Kyzyl-Arbat, a ship repair yard in Turkmenbashi, and a plant for oil equipment repair in Balkanabat. Developed is also the industry producing construction materials. The light industry is poorly developed: there are carpet factories in Kyzyl-Arbat, Kazandjik, and Balkanabat as well as in the urban settlement Esenguly; and garment factories are in Balkanabat, Turkmenbashi, and others. The food industry is represented by the fish factory in Turkmenbashi. After becoming independent, special attention was focused on the oil and extraction industry. Foreign capital and leading world companies are invited for development here.

The key agribusiness is cattle breeding: distant-grazing sheep breeding (rearing of karakul, saradjinsky sheep and goats); camel breeding and large-horned cattle breeding, including cows in farming regions mostly in the Atrek, Sumbar, and Chendir river valleys. In Kyzylabatsky and Kara-Kalinsky etraps sericulture is practiced. Farming is not widely developed: only grains, perennial forage, melon crops, and grapes are cultivated here. The greater part of agricultural lands is used for grazing; however, construction of the Karakum canal made it possible to increase irrigated areas under cotton.

Turkmenbashi is a large railroad cross-link and a sea port. In 1962, the sea ferry line Krasnovodsk (Turkmenbashi)–Baku was opened and has successfully functioned. On the Caspian Sea coast are constructed specific cargo-oriented terminals for transportation of oil (Aladja, Ufra); table salt (Kuuli-Mayak); and sodium sulfate, bischofite, epsomite, and others (Bekdash). Local cargo is transported using the port in Okarem. The pipeline transport is well developed in the velajat, with the gas pipelines Koturdepe–Khazar, Koturdepe–Turkmenbashi, Kyzylkum–Balkanabat; the oil pipelines Koturdepe–Belek, Khazar–Koturdepe–Belek, Vyshka–Belek–Turkmenbashi, Barsa-Gelmes–Okarem, Dagadjik–Azizbekovo; and the water mains Yaskhan–Balkanabat; Djebel–Khazar, Djebel–Turkmenbashi, etc.

Educational, scientific, and cultural establishments are also found in the velajat.

Balkhan Bay – a bay cutting deeply into the eastern part of the northern coast of Krasnovodsk Bay in Turkmenistan. The size of the bay depends on water level fluctuations in the Caspian Sea. The northern entrance cape of B.B. the Cape Kubasengir (Gubasengir).

Balyk – cured or smoked fillet of the back, side, and belly of large and fatty fish, such as beluga, sturgeon, and starred sturgeon. B. is not only a cured fillet. After curing, the fillet may be subject to cold smoking. The hung and cured fillet of white salmon (sheefish) is the most highly regarded.

Balykshi – a settlement to the south of Atyrau in the Republic of Kazakhstan located on the left bank of the Ural River, 30 km from the Caspian Sea. The main occupation of the local population is fishing and fish processing.

Banchin, Banchina – a riverbed depression in the Volga delta; extensions of channels having no continuous overwater banks may meander, forming narrow, elongated islands and spits over time; the initial stage of formation of a delta arm in the Volga lower reaches; a flow trough in a not well formed depression where runoff appears only after copious rainfalls.

Bandar Anzali (1919–1980 – Pahlavi) – a city and sea port as well as an Iranian naval base on the Caspian Sea in Gilan Province. It was built from 1904 to 1913 on the strait linking the Anzali Lagoon with the sea. The city is located on the western and eastern shores of the strait and also on Manpushte Island. The Caspian highway runs through B.A. and connects it with all settlements on the coast. The population is 55.4 thou. The port area is approximately 119 thou m², with docks of about 1,000 m², terminals of 35 thou m², and cargo warehouses of 22.3 thou m². B.A. is an important center of fishing and fish processing. Power plants, fishery, cotton ginning factories, tobacco factories, timber mills, food, and woodworking industries are located here. This is also the center of black caviar production. It is the port through which cargo traffic between Russia and Iran occurs, and there is the ferry line Bandar–Anzali–Olya (Astrakhan Region of Russia). A resort are on the sea is also located here.

Bandar Torkaman (formerly Bandar Shah) – a port city and terminal of the Trans-Iranian Railway in Golistan Province of the Islamic Republic of Iran. It is located in the northeastern part of Gorgan Bay on the Caspian Sea. The population is 126 thou (2006). For many years this has been the main port for trading with Russia, regardless of assaults by Torkaman pirates attacked vessels and robbed them who until the twentieth century. After construction in the 1930s of the Trans-Iranian Railway, it also becomes the only railway cross-link on the Caspian southern coast. During World War II, the port facilities were improved and its capacities were increased. The port was used to supply armaments and food to the USSR, and may be approached along a canal that is constantly filled with the sediments of the Gorgan River, thus requiring regular dredging works. It has 3 jetties and an oil terminal. All terminals are provided with access railroads. The city itself is located 2 km east of the port, and at present they have practically merged. The city is connected by highways with all major cities in Iran as well as with small towns on the coast. The city is a fishery center.

Bank – an urban settlement in the Neftechalinsky Region of Azerbaijan not far from the mouth of the Kura River, 15 km northward of the railroad station “Neftechala.”

The population is 7 thou (2007). B. has fish processing, mostly handling so-called “red fish”, which means sturgeon. It was the largest fishery enterprise in the Azerbaijan Socialist Republic.

Bank (Coast) Protection Structures, Coast Strengthening – structures designed to protect water body banks from the negative effects of waves, currents, ice loads, and other natural factors. Depending on their interactions with the water flow, *active* and *passive* structures are distinguished. The active make use of the water flow energy for aggradation and accumulation of coastal sediments (on rivers – transverse spurs, regulating dikes, training dikes; on seas and lakes – breakwater jetties, sediment-trapping dikes). Passive facilities are designed to oppose the water flow, relying upon strength and stability of their construction (on seas – break walls, riprap of large and shaped blocks; on rivers – riprap, mattresses, gabions, concrete, and reinforced concrete slabs).

Banok – a waterway, river arm, or deep natural channel along which vessels may pass from the Caspian Sea to the Volga delta and back; in the Lower Volga, deep arms along which fish run to the sea; a strait between lagoons and the sea. V.I. Dal (1912) states that in terms of the Caspian in the Volga delta, B. means a channel or channel’s line, while the shoal is midstream; however, the shoals are named as Chisty banok, Polenyi banok. B., an isolated shoal formed as a result of seabed rising to a depth of no more than 20 m, is considered dangerous for shipping. There are sandy, stony, coral, and other types of B. On the Caspian Sea, B. is an underwater mud volcano. B. is found largely within the Baku Archipelago and the Apsheron Archipelago. Sometimes B. is used for fishing. The largest delta arms of the Terek River are Glavny B., Batmaklinsky B., Kuni, Kubyakinsky, Northern, Middle, Uchinsky B.

Barge (French “barge”) – a non self-propelled cargo vessel. By region of navigation, river, lake, and sea barges are distinguishable. By type the transported cargo there are bulk-cargo, tanker, and universal B. Quite recently, B. of offshore drilling platforms have appeared. For transport, they are towed or pushed. They hull steel, reinforced concrete, and wood. The displacement of river barges does not exceed 4 thou t, while lake and marine barges have 10 thou t of displacement.

Barren Fish – fish without roe.

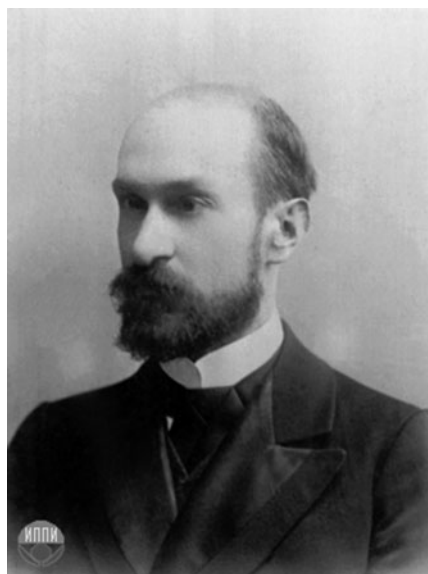
Barrier Beach – a narrow, sandy, water-permeable spit or natural sand levee composed of sand or pebble and separating bays, lagoons or brakish estuaries from an open sea or lake. It is formed by the combined action of sea (lake) currents and tides, aggradation processes in river mouths, and tidal activities in shallow areas. The largest B.b. on the Caspian Sea is Turalinsky in Daghestan. It separates the ancient lagoon, the Greater Turali Lake, from the sea.

Bartold Vasily Vladimirovich (1869–1930) – one of the most renowned representatives of the Saint-Petersburg period in the Russian Oriental sciences of the late

nineteenth to early twentieth centuries. He studied at the faculty of oriental languages at Petersburg University. At the age of 30, he became the Academician, Professor at Petersburg University. He was a member of nearly all European academies and scientific societies and a wide specialist in Oriental disciplines. The basic lines of his scientific activities are history of the peoples and states of Central and Middle Asia; interaction of Oriental and Western cultures; and the history of Islam. The works of B. contain enormous amounts of factual material supported by archeological and numismatic data. B. delivered lectures at various universities. He made significant contributions in the development of a network of scientific establishments, educational institutions, and libraries in Central Asia, including collections manuscripts for study in local archives. In 1924 in Baku he read a cycle of lectures, “The Role of Circum-Caspian Areas in Moslem World History” to young intellectuals.

His most important works are “Turkestan in the epoch of the Mongolian invasion” (in two volumes, 1898–1900); “Information about the Aral Sea and Amu-Darya lower reaches from the ancient times to the fifteenth century (1902); “History of Oriental studies in Europe and Russia” (1911); “Ulugbek and his time” (1918); “Islam” (1918); “Turkestan History” (1922); “Essays” vols. 1–9 (1963–1977), and others.

Bartold V.V.
(www.nlr.ru/ar/staff/bart.htm)



Basic Salting – heavily salted fish; salting fish with a large amount of salt for long storage.

Baskunchak – a saline self-deposition lake in the Astrakhan Region of Russia located to the east of the Volga, near the Bolshoye Bogdo Mountain. Its area is

115 km²; the surface elevation of the lake is 21 m below ocean level. One of the largest such lakes in the world, the lake basin appeared as a result of tectonic processes. B. is fed by numerous saline springs. Table salt is deposited in the lake basin in several layers. The top is made of the most recent deposits, brought by the waters of saline springs flowing into the lake basin. The next layer is “chugunka” and still lower layer is “granatka”, which is most valued for its purity and taste. The salt is mined, and B. is the main “saltcellar” in Russia.

Bastard Sturgeon (*Acipenser nudiiventris*) – fish of the sturgeon family. Anadromous fish. It mostly inhabits the southern part of the Caspian from where it runs to the Kura River for spawning; in the Iranian part it runs to the Safid Rud River. It lives for 30 years and more, reaching the length of 215–220 cm and a weight of 30 kg. Fertility of Caspian B.s. is 280–1,290 thou eggs making on the average 593 thou eggs. B.s. feeds largely on fish and mollusks. On the Volga, all hybrids of sturgeon fish are referred to by fishermen as “bastard sturgeon.” In nature, B.s. crossbreeds with great sturgeon, starred sturgeon, and sturgeon. In the Kura River, as a result of artificial fertilization, such hybrids as bastard sturgeon + sturgeon and bastard sturgeon + starred sturgeon are available.

“Batys” – a maritime custom’s house and quick response service on the Caspian Sea created in Kazakhstan. From January 1998, its zone of operation has been the whole sea area within the state borders. In its work the service uses high-speed boats, accessory vessels, and aviation (helicopters). Among the tasks of B. is to fight smuggling, to protect oilfields, and to control the oil supply from Tengiz to Baku.

Bautino – a settlement and port located on the eastern coast of the Caspian sea in the vicinity of Fort Shevchenko at the apex of the Tyub-Karagansky Bay cutting into the peninsula with the same name in the Mangistau Region of the Kazakh Republic. It is named in honor of A.G. Bautin, the first Chairman of the Council of Deputies of the Adaevsky ouezd (district) who was killed in 1919 by local *kulaks* (rich peasants). A convenient Bautino Bay is found here. The sea port B. (cargo port “Bautino”) does not handles large quantities of cargo (only about 150 thou t of dry cargo a year). The water area of the port does not freeze up, and storms are quite infrequent here. A fish cannery and a water desalination plant with a capacity of 500 m³/day are located here. There are plans to develop this port and make it a base for supporting offshore drilling because it is located near the Eastern and Western Kashagan fields and it could serve as a moorage for the vessels of the national company “Kazmortsneft.”

Bay – a small part of an ocean, sea, lake isolated on three sides by coast or islands; a small harbor protected from wind and opened with one side to the sea, lake, or reservoir. Local conditions create a specific hydrological regime of a bay that differs from the regime of nearby waters. B. is usually a very convenient place for ship moorage. The Caspian Sea has ten B., some of which are quite large and include the

Kara-Bogaz-Gol, the Kazakh, the Turkmen, the Agrakhan, the Kizlar, the Gorgan (Astrabad), and others.

Baer Karl Ernst, Von or Karl Maksimovich (1792–1876) – the distinguished natural scientist, founder of embryology, and one of the encyclopedic minds of the nineteenth century. He made a great contribution into development of zoology, anthropology, and geography. He was born not far from Revel (Tallinn) in the German family. In 1810, he entered the medical faculty of the Derpt (Tartu) University. At the age of 22, he was awarded the academic degree of the Doctor of Medicine, and in 1828, became Academician of the Petersburg Academy of Sciences. In 1862, he became its honorary member. In 1817, he was appointed a prorector of the Koenigsberg University. In 1834, he was invited to the Petersburg Academy of Sciences. In 1839, he studied the islands in the Gulf of Finland and later the Kola Peninsula. In 1845–1846, he went on a trip over the Mediterranean for scientific purposes. He took part in the expeditions to the Novaya Zemlya, Crimea, and Kola Peninsula (1840); Chudskoye Lake and Baltic Sea (1851–1852); moderate-climate zone of Russia; and Transcaucasus and Kalmyk Steppes.

For about 4 years (1853–1857), he headed the Fishery Expedition of the Northern Caspian that studied the fishery conditions in the Caspian Sea and in the inflowing rivers. At first, the expedition visited the Volga lower reaches near Astrakhan and then the Kura mouth, the place of the so-called “the God’s fishing.” B. wrote about this as follows: “This is, undoubtedly, the richest sturgeon fishing area not only in the Caspian area, but in the whole world.” At that time in this “the God’s fishing” from 1,000 to 1,200 great sturgeons, 20–30 thou sturgeons, 150–200 thou starred sturgeon, and 90 thou catfish were fished. B. collected very extensive materials about fishery in the Kura River. In 1856, he once more traveled over the Caspian Sea for a year. The results of these expeditions were described in volume II of the book, “Fishery Studies in Russia,” with included maps, while particular episodes of this expedition were described in “Caspian Episodes” and in separate articles in the “Proceedings of the Emperor’s Russian Geographical Society” and academic publications. Apart from the principal task of this expedition, the study of the fishery conditions, there were also studies of economics and agriculture of the Caucasian peoples, as well as their languages and the flora and fauna of this area.

B. studied the ecology of main commercial fish species, following their spawning run, spawning grounds, and hibernation. He found out the causes of fish catch drops: destruction of fries, overfishing, and closing of access for producers to spawning grounds. He also developed recommendations on the rational fishery. For the first time, attention was drawn to dependence of a fish stock on the hydrological conditions of the sea. At the same time, B. studied the Circum-Caspian steppes (shaping of sandy hills) and the Kuma-Manych Depression via which plans were made to connect the Caspian with the Azov Sea. B. expressed a new outlook on the conditions and time of the Caspian depression formation. He connected the Caspian formation and fluctuations of its water level with tectonic processes and disclaimed its gradual drying. In 1857, he spoke about regularities in caving of the right banks

of rivers in the Northern Hemisphere and left banks in the Southern Hemisphere (“general law of the riverbed form – Baer’s Law”).

B. was one of the founders of the Russian Geographical Society (1845) that in 1861 awarded him the Konstantinovsky Medal for studies of the Caspian Sea and reports on Caspian fisheries. In commemoration of 50 years of scientific activities the Petersburg Academy of Sciences embossed a jubilee medal depicting the great natural scientist. In 1875 in Petersburg were published 5 volumes of the fundamental works of K.M. Baer and N.Ya. Danilevsky, “Study of Fisheries in Russia.” The term “Baer’s hills” in the Circum-Caspian area also came into use. A monument to B. is constructed in Tartu.

For the works of K.M. Baer expeditions see “Caspian Expeditions of K.M. Baer (1853–1857). Diaries and materials” (Nauchnoe nasledie, Leningrad, 1984). The name of B. was given to two capes on Novaya Zemlya and Franz Josef Land in the Barents Sea, the island in Taimyr Guba in the Kara Sea, mountains on the coast of the Kara Sea, and the mountain on Spitzbergen.

Beak-Shaped Delta – the simplest deltaic form. It is made up of two estuarine spits and the estuarine river segment. BSDs are the most recent deltas of the Terek and Sulak Rivers that were formed near their new man-made estuaries.

Beketov Nikita Afanasievich (1729–1794) – a writer, lieutenant-general, senator, and favorite of Empress Elizaveta Petrovna. He was a descendant of the Cherkess dukes. From 1763 to 1774, he was the Governor of Astrakhan. B. actively supported the government idea on settlement of the steppes. In 1763 near Astrakhan on the Volga banks a settlement of 65 Lutheran families was founded. It received the name, Vizental Colony. B. was the founder of some other German colonies, including the well-known Sareptsky colony. He did much for the appearance of many Cossack villages on the vast expanses from Astrakhan to Cherny Yar. Such policy caused complications in relationships with the Kalmyks and in 1711 a part of them migrated to Djungaria. B. paid much attention to the improvement of this territory, including the development of vine growing, wine-making, and sericulture. He introduced new rules for charging duties to fisheries, and as a result the revenues from fisheries started flowing into the state treasury not only from the Astrakhan Province, as it had before, but also from other provinces; thus, these duties became some of the most lucrative items for the state treasury.

Bekovich-Cherkassky, Alexander (unknown–1717) – before accepting Christianity, his name was Jansoh, Devlet Kizden-Murza, Devlet-Girey-Murza, and his birth year remains unknown. A duke from the clan of Kabardinsky rulers, he was one of the associates of Peter I. A political and military figure and hydrographer, there is no accurate data about his origin and a time of joining the service at the Russian tsar. In 1707 B.-Ch. was sent by Peter I to Holland to study the art of navigation. In 1711, he was sent with a diplomatic mission to Kabarda. On returning, he prepared a draft paper on the Caucasus joining to Russia and the development of relationships with Persia. In 1714–1716 B.-Ch. took part in investigations of the Caspian Sea, in particular, he surveyed the eastern coast with Kara-Bogaz-Gol Bay.

He made up the first cartographically sound map of the Caspian Sea (for a long time it was thought lost, but in 1952 it was found). For his activities, Peter I promoted him to the guards captain. He founded 3 fortresses. B.-Ch. was killed in 1717 during a gold prospecting expedition to Khiva. The fortresses that were built on their way were destroyed. The expedition turned fruitless. B.-Ch. is considered to be the “first hydrographer of the Caspian.” His name was given to one of the bays in the Caspian Sea, a bank and spit in the Turkmenbashi (Krasnovodsk) Bay.

Bektash (Bekdash, Karabogaz) (Turkish – “*high stone*”) – an urban settlement that appeared in 1963 after the joining of the settlements of Severnye Promysly, Bektan and Omar-Ata as a center of the salt mining industry. It received its name from a cape. B. is located to the southeast of the Bektash Cape on the Caspian coast in Turkmenistan. Its population is 10 thou (1996). Some infrastructure of the Production Association “Karabogazsulfat” is found here, including administration, port, repair-construction workshop, fuel and municipal facilities. Through the port of B., “Karabogazsulfat” exports its products. On 9 August 2002 B. got a status of a city and a new name – Karabogaz.

Bektash (Bekdash) – a bay located 60 km to the northwest of the Kara-Bogaz-Gol Strait, Turkmenistan. In the northeast it is limited by the sandy, undulating coast of the mainland between the capes of Dagdjik and Bektash, and in the south and west, by islands surrounded by overwater and underwater structures, the biggest of which is the Kara-Ada Island.

Belinsky-Caspian Waterway (BCW), Belinsky Canal, Belinsky Channel – the second largest waterway connecting the port in Astrakhan with the Caspian Sea. It makes the way from Astrakhan port to the northeastern part of the Caspian 200 km shorter compared to the way along the Volga-Caspian canal. BCW is 134.3 km long and via the Bushma arm only 127.6 km. BCW is divided into the sea and river parts. The sea part runs along the Belinsky canal and is constructed in the shallow part of the Caspian Sea. The river part has two routes. The deepest, but the longest route goes along the Volga arms: Belinsky Balk, Permyakovi, Shata-Bushma, Kashkaldak, Bystryi, Rychan, and Pryamaya Bolda or Krivaya Bolda. The other route goes along the same arms, but bypasses Kashkaldak, Bystryi, and Rychan.

Belyak – a small bream, its shoals run from the Caspian to the Volga River; in the past the spring fishing season began on March 15 and lasted until June.

Belyana – an ancient rafting vessel on the Volga. Its length was to 100 m, its width was 25 m, and its height was 5 m, with a carrying capacity of up to 5 thou t. The vessel was built from white (without bark) timber, thus, its name means “made of white wood.” The vessel was constructed only for one journey. It was made by pine logs or timber intricately piled on each other, and sometimes of unfinished houses that were not tied by anything, but were kept together only by “intricate” placement. The lower part of the huge body of such vessel had passages that were designed for air drying of raw timber and for passage of the crew from one side to the other. B.

had neither masts nor sails. Two houses of hewed logs were built on both sides for the crew and between them a small cabin with a flag that was like a captain's deck house. The steering wheel was on the bow and not on the stern. The vessel was propelled by water flow. B. was kept in the channel with the help of a "trailer," a cast iron bob weighing several dozens of poods (1 pood = 16.38 kg). It was dropped from the stern. The bob dragged over the riverbed slipping to the deepest places. B. was constructed in winter and spring floods put it afloat. Having reached Astrakhan, the cargo (timber) and the hull of the vessel were dismantled and directed to saw mills. Thanks to B., the city was built up with wooden houses. The last B. sailed along the Volga in 1934.

Benchmark (Sea-Level) Gauges – sometimes referred to as secular gauges. At the end of the twentieth century, there were four such main gauges on the Caspian Sea: Baku (continuous observations from 1837), Makhachkala (1900), Krasnovodsk (1915), and Fort Shevchenko (1921). The sea level measured by these four gauges is regarded as the mean for the sea as a whole.

Bender-Gyaz (Bandar-Gaz) – a settlement and large trade center in the Golestan Province of Iran. It is located on the southern edge of Gorgan Bay. In the past, it was a port, but after construction of Bandarshah port (at present Bandar-Torkaman) with which it was connected via a railroad, it lost its significance as a port.

Bender-Shah (Bandar-Shah) – see *Bandar-Torkaman*

Benthos – organisms that live on, in, or near the bottom of the sea and inland water bodies.

Berg Lev Semenovich (1876–1950) – well-known Russian geographer and biologist. Corresponding Member of the USSR Academy of Sciences from 1928, Academician from 1946, RSFSR Honored Worker of Science (1934), Honorary Member (from 1934) and President (1940–1950) of the USSR Geographical Society. Laureate of the USSR's State Award (1951) for the monograph "Fresh-Water Fish in the USSR and Neighboring Countries" (1946, 4th edition, Parts 1–2, 1948–1949). Professor in ichthyology and hydrology at the Moscow Agricultural Institute. From 1916, professor at the Petrograd (Leningrad) University, and from 1925, he chaired the faculty of physical geography. Berg conducted investigations in Western Siberia, Central Asia, Povolzhie, on the Caucasus, on the East-European Plain, and in other regions of the USSR. His scientific interests cover the theory of geography, landscapes and landscape zones, regional geography, history of Russian geography, ichthyology, limnology, climatology, palaeogeography, and also geomorphology, lithology, soil science, glaciology, zoogeography, and others. B. developed further V.V. Dokuchaev's theory on natural zones, developed a theory of landscapes, and proposed the soil theory of loess formation. One of the chapters in his book "Essays on the History of Russian Geographical Discoveries" (1949) was devoted to the first Russian maps of the Caspian Sea in connection with its

level fluctuations. It was written using his earlier works, such as “Caspian Sea Level Fluctuations in Retrospect” (1934), “First Russian Maps of the Caspian Sea” (1940), and “Data on the History of the Caspian Sea Level Fluctuations” (1943).

A prominent place in his scientific studies was taken by investigations of the Caspian Sea. In the 1930s, using archives beginning from the sixteenth century, B. plotted a graph of the century dynamics of the Caspian Sea level. He quite accurately noted that during warming in the Arctic the water level in the Caspian dropped and during cooling, rose. During warming in the Arctic region the Atlantic cyclones move mostly to the north. At the same time, in the cold season of a year, the anti-cyclonic weather becomes established in the Volga basin that involves reduction of winter precipitations and river runoff to the Caspian Sea. During a period of a sharp drop of the sea level, B. asserted that “we cannot speak about any continuous dropping of the Caspian level for the historical time. The low-level period . . . should be replaced with a high-level period.”

His principal works are: “Will Central Asia Dry Out?” (1905); “Aral Sea: Experience of Physiographical Monograph” (1908; for this work B. was awarded the academic doctoral degree in geography and the medal of the Russian Geographical Society named after P.P. Semenov-Tyanshansky); “Experience of Siberia and Turkestan Division into Landscape and Morphological Areas” (1913); “Subjects and Tasks of Geography” (1915); “On Loess Origin” (1916); “Geography and Its Position Among Other Sciences” (1925); “Climatology Fundamentals” (1927); “Essays on the History of Russian Geographical Science” (1929); “Relief of Siberia, Turkestan, and the Caucasus” (1936); “Physiographical (Landscape) Zones of the USSR” (1936); “Essays on the History of Russian Geographical Discoveries” (1946); “One Century of the All-Union Geographical Society. 1845–1945” (1946); “Landscape-Geographical Zones of the USSR” (Part 1, 1931, 3rd edition; Part 2, 1947); “Geographical Zones of the Soviet Union” (1952); “Climate and Life” (1922, 2nd edition, 1947); “Nature of the USSR” (1937); “Selected Works” (vols. 1–5, 1956–1962).

Besh-Barmak (Turkish: “*five fingers*”) – a mountain located 30 km to the north-west of the Kilyazinskaya Spit and 3 km from the Caspian coast in the Azerbaijan Republic. Its height is 590 m above ocean level, and it has the form of a truncated cone. Not far from the central peak are 4 more cliffs that, together, resemble 5 fingers. Thanks to such a specific shape this mountain is visible from the sea within a range of 30 km. On its western slope is found the ruins of the Khydyrzynde castle that was one of the Besh-Barmak structures that comprised, all together, a magnificent stone citadel with two clay walls that were spaced 200 m from each other and extended out in parallel for a distance of a 1.5 km from the foot of the mountain to the Caspian Sea. These fortifications were built on orders from the Sassanid Kings to protect the northern borders of the kingdom.

Bester – intentionally bred hybrid of great sturgeon and starlet. It resembles great sturgeons, but has the size of starlets.

Bezmyanny – an island located 4.5 km to the south-southeast of tip of the Southern Cheleken Spit in Turkmenistan. The island is sandy and surrounded by a shoal.

Bibi-Eybat (Bibiheybat) – formerly Ilyich Bay.

Big-Eyed Caspian Sprat (*Clupeonella grimmi*) – a species of small herring belonging to the genus of common or Caspian kilka. This is the most deepwater species, living at depths from 70 to 250 m; it has found even deeper (at 300–450 m). It lives in open sea in the Southern and Middle Caspian, making vertical migrations and avoiding surface waters over 14°C. It is the main feed for predatory fish in the Caspian.

Big-Eyed Shad (*Alosa saposhnikovii*) – an endemic fish species, its length is 35 cm at maximum, with an average of 14–28 cm. It has big eyes. It hibernates in the Southern Caspian and runs to the northern sea to spawn. While in the Southern Caspian, the shad inhabits deep tiers, much deeper than many other herring. It lays eggs in the Northern Caspian at a depth from 1 to 6 m at a water temperature of 14–16°C and salinity from 0.07 to 11‰.

Bight – a river bay with a reverse or no water flow, it is part of the river or lake near the river bank, usually behind a cape jutting out into the river, with slow or reversed flow.

Bilgyah (Bilgah) – a climatic and spa resort on the sea in the Azerbaijan Republic. This is an urban settlement 40 km north of Baku. It is one of the resorts on the Apsheron Peninsular, located on its northern coast. The climate here is dry, subtropical. The average temperature in January is about 2°C and in July is 25°C. Precipitation is about 200 mm a year. The number of sun hours is 2,800 a year. Apart from its favorable climate, warm sea, and sandy beaches, curative agents are available here, including iodide-bromine waters, the sources of which are in a park in the resort zone. This resort offers its guests climatic and thalasso therapy (the bathing season is from mid-May through mid-September) and balneotherapy (iodide-bromine and sulfide baths with mineral waters from Surakhan sources).

“BIOS” – Federal State Unitary Enterprise “Scientific-Production Center on Sturgeon Farming.” It was established in 1994 in the village of Ikryanoe of the Astrakhan Region and unites scientists from CaspNIRKh and other biological institutes of Russia and CIS countries. It has at its disposal a modern base for the Ikryansky experimental sturgeon fishery farm. Its main lines of activities are commercial sturgeon breeding; selection and formation of the brood stocks; creation and preservation of the sturgeon gene fund; cultivation of fish seeding material, including fertilized eggs, larvae of fries, and youngsters-of-the-year; testing of new fodder and feeding technique; investigation of the value and biochemical specific features of the artificially bred commodity sturgeon; and reproduction of the sturgeons for replenishment of their natural population. “BIOS” breeds the quickly growing hybrid forms of the sturgeons (bester, shister, Russian-Lena sturgeon, and

others) for ponds, basins, stocking ponds, thermal farms, closed water supply systems and farms with natural water temperature. It is Russia's major supplier of fish breeding material of sturgeons of different age categories received from its own parent stock.

Biosphere Reserve – (1) representative landscape unit, determined under the UNESCO program “Man and Biosphere” with a view to its conservation, study (and/or monitoring). May include ecosystems absolutely unaffected by economic activity or little-disturbed, more often than not surrounded by lands in productive use. BRs are set up in over 60 countries worldwide. There are two BRs in the Caspian area: Astrakhan and “Black Lands”, Russia; (2) Strictly protected natural site of significant area, virtually free of any local impacts of the surrounding landscapes transformed by man, where age-old processes have been under way; the nature of these areas makes it possible to spot spontaneous changes in the biosphere, including man-induced ones on a global scale; (3) territory on which gradual tracing (monitoring) of man-induced changes in natural environment on the basis of instrumental observations of bio-indicators is arranged.

Biryuzyak – an island in the west of the Northern Caspian in Russia. It is located 50 km from Bryansky Spit and is separated from the shore by a channel. The settlement of Biryuzyak is located on its northern tip.

Black-Backed Shad (*Alosa kessleri kessleri*) – one of the subspecies of Kessleri herrings, it is the largest at up to 52 cm in length and weighing 1.8 kg. The back is dark-violet or almost black. The teeth exhibit rather good development. B.B.S. winters in the Southern Caspian opposite the Iranian shores.

Growing rapidly, B.B.S. attains full maturity at age 4–5 years. Afterwards, the fish spawns each year. B.B.S. is a predator, feeding on small fish. Its lifetime is 6–7 years. In spring, from March to April, it moves to the north, mainly along the western shores in open parts of the sea. Mass run in the Volga delta begins in late April–early May at water temperature of around 9°C and ends at 22°C. During passage, while covering around 300 km from the wintering in the Southern Caspian to the Volga spawning grounds for 2–3 months it eats almost nothing and grows visibly lean. B.B.S. was popularly called “mad,” and people were reluctant to eat it. In the nineteenth century and until the 1930s, there used to be exceptionally large numbers of B.B.S. assembling in the middle course of the Volga River between Saratov and Kuibyshev (currently, Samara) for spawning. The spawning process was really wild: herring runs would dam the river, and fish would rush about to and fro, jumping out of the water as if they were imbecile and springing onto the spits. Biologists were forced to prove that the marvelous fish was absolutely harmless. Nowadays, B.B.S. spawns in June–July downstream of the Volga Hydropower Plant. There are no huge runs any more. Spawning takes place in June–July at water temperatures from 14 to 18–20°C, and fish eggs are laid mainly in the evenings. The growing roe and alevin are brought down the river by the flow. After spawning, many individuals die, while others run to the sea. A year later, up to 14–21% of the fish arrive for spawning the second time, but only 3% make it for the third time. Young fish spend 1.5–2 months

in the river, come in the pre-estuarine areas of the Volga in August–September and in November leave the Northern Caspian for the South.

The large and fat B.B.S. (zalom – “folded herring”) is the most valuable of the Caspian herrings in terms of nutrition.

“Black California” – the term that Russian officers in the late nineteenth century used to name the vast terrain on the eastern coast of the Caspian Sea because of its rich ozokerite deposits.

Black Cliffs – see *Neftyanye Kamni*

Black Gorge, Black Jaws – see *Kara-Bogaz-Gol Bay*

Black Lands – a part of the Near-Caspian Lowland between the Yergeni upland and the Stavropol upland on the one side and the Volga lower reaches and the north-western coast of the Caspian Sea on the other. This territory’s name is from the fact that during winter the lands are not covered with snow because of frequent thawing and strong winds blowing off the snow, thus exposing the land surface. L.N. Gumilev described B.L. as follows: “. . . because in winter a thin snow cover mixes with dust, black snowstorms are observed.” In 1910, M. Gavrilov, a water engineer working with the Kalmyk Steppe Department, wrote the following: “Black lands are no other than the old dunes and alluvial river deposits not covered with clay, but overgrown entirely with grass. They are called “black” because of their capacity (as any other sands) to be free of snow in winter, thus creating a possibility for the cattle to graze.” The vegetation here is of a semi-desert type. It is used as distant-grazing pastures in winter.

“Black Lands”, Biosphere Nature Reserve – established in 1990. It is located in the northwestern part of the Near-Caspian Lowland on the territory of two administrative districts – Yashkulsky and Chernozemelsky, Republic of Kalmykia. Its area is 94.3 thou ha with a buffer zone extending over 156 thou ha.

The nature reserve territory represents an undulating plain with the terrains of small-hummock and hummock sands deflated in some places and with weathering hollows. Widespread are desert, wormwood-soddy-cereal steppes where feather grass, black and white wormwood, leban, and chamomile grow. Communities of steppe-like meadows and solonchaks are also found. Rare species, such as Teliev blue cornflower, beautiful and Zalessky feather grass, Shrenk tulips, that were in the RSFSR Red Book grow here. The fauna consists of typical steppe and semi-desert species, such as stepperunner, randy, sand boa, glass snake, steppe viper, and Montpellier snake. Among mammals are the saiga, the brown hare, the eared hedgehog, the little gopher, the five-toed jerboa, the hairy-footed jerboa, the corsak, and others. Many birds, such as little bustard, bustard, white and Dlamatian pelicans, as well as fish such as sprat, bullhead, smelt, and others in the RSFSR Red Book were found here.

“B.L.” is Russia’s only area for study of the structure and dynamics of arid biocenoses. The main directions of researches are monitoring of the Kalmyk population of saiga, steppe eagle, demoiselle, and little bustard, the study of restoration

processes in ecosystems characterized by low biodiversity due to long-time anthropogenic impacts, and others. At the time of the nature reserve organization the saiga population was 160 thou. In 1993, the “B.L.” nature reserve was included into the world network of biosphere nature reserves and received international status. In 1996, it was allotted a part of the territory of the former federal natural preserve “Manych-Gudilo” with an area of 27.6 thou ha. A new territory of “B.L.,” which became its ornithological branch, is located 200 km from the main territory.

Black Storm – transfer of great quantities of dust from a soil surface devoid of vegetation by strong, dry winds. B.S. occurs in the Near-Caspian Lowland and in the south of the steppe zone of European Russia.

Blaramberg, Ivan Fedorovich (1800–1878) – of Dutch origin, he was born in Frankfurt-am-Main and graduated from the law department of Hessen University. In 1823, he went to Russia (Moscow) where he studied Russian and improved his knowledge of French literature, mathematics, history, and drawing. In 1824, he naturalized in Russia. He graduated from the Institute of the Railway Engineers Corps and took part in the Caucasus campaigns against highlanders as the General Staff officer. From 1832 to 1836, he completed an extensive description of the Caucasus. In 1836, he was awarded the captain’s rank. In the same year, B. took part in the expedition of G.S. Karelin to the southeastern shores of the Caspian Sea. B. was in charge of keeping records for this expedition. Together with G.S. Karelin, he prepared a detailed description of the eastern coast of the Caspian. Later, he was promoted to general. In 1850 in the Proceedings of the Emperor’s Russian Geographical Society, he published his “Topographical and Statistical Description of the Eastern Coast of the Caspian Sea from the Astrabadsky Bay to the Tyuk (Tyub) – Karagan Cape”. In 1853, he published in these Proceedings the “1836 Expedition Journal of Surveys of the Eastern Coast of the Caspian Sea” and “Statistical Review of Persia.” In his last years of life he published his “Memoirs,” which were translated from the German and published in Moscow in 1978.

Blended Crudes (Brent, Urals, Arabian, East-Texas, Nigerian) – selection of various crudes taken in a particular correlation from the fields in major oil-producing regions, on the strength of which the average price of crude recovered at these fields is determined at the international oil exchanges.

Blinov – an island in the delta front in the Obzhorovsky area of the Astrakhan nature preserve. It is overgrown with cane and cattail. These are continuous cane-cattail thickets flooded with water and extending for 10–15 km. In some places, where within the cane thickets some willow groves exist, small spots of “solid” earth can be found, but only during low-water periods.

Block Salting – chilled fish salting.

Bogaz – “neck” or “passage, strait” in Turkish; “mouth of a river, canal, gorge, narrow, narrow mountain passage” in Turkmen – from the latter is derived the Kara-Bogaz-Gol, a bay and strait of the Caspian Sea.

Bolda, Bolda System – the second largest (length of 74 km) channel in the Volga delta after the Buzan system. Though there are many channels, its hydrographic network is rather simple. It originates at the confluence of two channels on the eastern side of Astrakhan, and then it breaks into several arms, some of which reach the Caspian Sea. The main flow directions in this system are the Krivaya Bolda, Pryamaya Bolda–Bolshaya Bolda–Trekhozbenka with an outlet into the Tishkovsky canal; the Bolshaya Bolda–Bolshaya Chernaya (together with the Tabola from the Kamyzyak system)–Karalatsky bank, and the Rychan–Sukhoy Rychan with an outlet into the Tishkovsky canal.

Bolshaya Plita – an island located 5.3 km to the east of the southern tip of Artyom Island. It is a part of the Apsheron Archipelago in the Azerbaijan Republic and extends meridionally for 550 m. Its width is less than 180 m, and its elevation is not high. Its southern part is composed of sand, while the north is solid stone that gives the island its name. To the west of the island is a small bay that is well protected from all winds.

“Book for Big Drawing” – in 1552, the Tsar Ivan the Terrible ordered “the land to be measured and a drawing of the state made,” which gave rise to the mapping not only of Russia, but of contiguous territories. The “drawing” thus conceived provided a description (explanatory note) of the largest map of the Russian lands, which unfortunately has not survived to this day as well as a code of geographical and ethnographic information drawn up in 1627 at the time of Boris Godunov. Eight editions are still alive. It was published for the first time in 1773 by N.N. Novikov.

Borisova Bank – located near the western coast of the Caspian Sea, to the west of the Kurinsky Kamen Island. It is part of the Baku Archipelago, which was discovered in 1936 and was named in honor of V.V. Borisov, who in 1924–1941 carried out hydrographic investigations in the Caspian Sea and took part in academic expeditions on the study of Mertvy Kultuk Bay and Kaidak Bay. He lectured at the Caspian Higher Naval College.

Borodin Nikolai Andreevich (1861–1937) – an ichthyologist born in the city of Uralsk to the family of Sotnik (lieutenant) of the Ural Cossack troops. After finishing the Ural Military College (with a gold medal) in 1879, he entered Petersburg University (in 1879–1880 he studied in the mathematical department; from September 1880, in the natural science department). During his university years he was socially active. He joined the group “Yaik” that consisted of students who came from the Urals, the so-called “*zemlyachestvo*.” In late autumn, 1883, he joined the social-democratic group headed by D. Blagoev, the Bulgarian revolutionary. Even after Blagoev was exiled from Russia, B. did not stop his illegal activities

in this group. Having graduated from university (1885), he went to Uralsk where in May 1886 he was arrested, but was released in June.

During his university years, B. studied the problems of practical fishery. From the 1880s, he took part in the organization of ichthyologic investigations on the Ural River. In 1884, he conducted artificial fertilization of stellate sturgeon eggs. It was the first successful experiment of its kind in Russia. In 1885, he published the work, “Statistical Atlas of the Ural Cossack Troops.” At the First All-Russia Fishery Exhibition in Petersburg (1889), B. showed Emperor Alexander III the exhibits. In 1891, he published his fundamental work “Ural Cossack Troops: A Statistical Description,” which was timed for the 300th anniversary of the founding of the Ural Troops. Later on for this work the Emperor’s Geographical Society awarded B. with the gold medal in ethnography and statistics.

In 1891 B. was sent on a 2-year trip over the countries of Europe and North America to study ichthyologic stations. After 1891, he was the troop’s assistant on the Ural fishery, a position created specially for him. In 1894, B. published his booklet, “Fishing Rules for the Ural Cossack Troops.” Beginning from 1896 and every year thereafter, he conducted experiments on fertilization of sturgeons and stellate sturgeons and the growth of their fries in the Ural River. In the second half of the 1890s, following on an assignment from the Russian Fishery Society, B. initiated a wide-scale investigation of the sturgeon biology in the Ural River (he studied specific features of their propagation, provided a comparative assessment of egg hatching techniques, cross-breeding of fish). B. did much for fishery improvement in the Ural River and Caspian Sea. He may be justly called the first researcher of commercial fish in the Ural River. He was one of the first who advocated utilization of fish wastes that contained many valuable chemical substances, rational management of the sea and river wealth, and proved a possibility of artificial breeding of sturgeon (sterlet, stellate sturgeon). In his work, B. widely applied the experience of simple Cossack fishermen.

B. was engaged in study, systematization, and inventory of the ichthyofauna, fishing statistics, fishing methods and fish processing, the problems of a fish stock, biology of commercial fish, and fish farming. Although B. did not find ways of addressing many problems, his activities laid the basis for practical sturgeon culture in Russia. He developed a teaching on stage-by-stage fish evolution, which became the theoretical basis for elaboration of fry growing techniques. He was one of the first in the country to formulate the principal parameters of rational fishery. He consistently improved the biological technique of sturgeon farming in the Ural River. The results obtained by him were unique in the world biological practice of that time. They showed the possibilities of sturgeon fries growing in artificial conditions.

In 1899, B. moved to Petersburg where he took the position of the Chief Specialist in Fish Culture in the Department of Agriculture. In 1902, he was elected the Secretary General of the International Fisheries Congress held in Petersburg. From 1900 to 1904, he also studied such fishery regions as Azov-Don, Black Sea-Kuban, Amudarya, and Caspian.

In 1901, B. published his book “Ural Cossacks and Fishery”; established the newspaper “Uralets”; was the publisher and editor of the “Ural Review” and

“Cossack Troops Bulletin” (1901–1904); and worked with the “Russian Gazette” (from 1894) and “Our Life”. He was a member of the Duma, representing there the Ural Cossack troops (1906). In 1907 his monograph “Pond Fishery,” and in 1908 the book “Caspian Herring and their Fishing” were published. From 1908, B. worked with the Refrigeration Committee. He pioneered the application of artificial cold for storage and transportation of fish products. After 1910, he again returned to the Department of Agriculture and delivered lectures on fishery at the Petersburg Agricultural Courses. From 1911 to 1914, on an assignment from this department he went on several long trips abroad to study the fish industry in other countries. In 1915, he went to the USA with scientific purposes. During World War I, B. was enlisted by the government as a specialist on application of artificial cold for storage of perishable foodstuffs.

After the 1917 February Revolution, B. took part in the Cadet’s propaganda campaigns in Petrograd. In 1917, he was elected to the Constitutive Assembly from the Ural troops. After its dissolution in 1918–1919 he worked at the Ministry of Agriculture and represented the Ural troops in the Kolchak government. He also lectured at the Omsk Agricultural Institute. In April 1919, the Ministry of Agriculture delegated B. to go to the USA for procurement of agricultural machinery and equipment for agricultural educational establishments of Siberia. Having learned about the defeat of the Kolchak army, he decided to stay in America. In 1926–1927, he worked as the assistant-advisor in the Museum of Art and Science in Brooklyn. In 1927–1928, he became the assistant in the US Museum of Natural Science and then Curator of Fishes in the Museum of Comparative Zoology (Department of ichthyology). From 1928, B. worked at Harvard University where he was awarded the professorship (1931). In 1930, he published his memoirs called “Ideals and Reality,” describing the events of his life in the period from 1879 to 1919. He died in 1937 in Cambridge, Massachusetts (USA).

Borozdina – a large depression in the seabed in the Northern Caspian. For example – Ural B.

Bottomland Meadow – area between the Volga and Akhtuba rivers, dissected by a dense network of bypasses and lakes connected with them.

Bounding Embankment – the fencing of a location with local earth dams to prevent inundation with surface waters.

Brazhnikov’s Herring (*Alosa brashnikovi*) – large and medium-size fish that may be up to 50 cm long. It lives and propagates in brackish waters of the Caspian Sea, never running to rivers. This species has 8 subspecies of which two are most widespread over the whole Caspian, while six others are found only in the Southern and Middle Caspian. The most commercially significant are dolginsky, agrakhansky, and gassankulinsky herrings.

Breakwater – protection structure, both ends of which are not connected with the shore.

Breeze – the local wind caused by daily changes in heating and cooling of land and sea. It changes its direction twice a day. In the daytime it blows from the sea (sea breeze), while at night it blows from the shore (coastal breeze). On the Caspian Sea, it blows from May through September, while on the southern Iranian coast it blows throughout the year.

British Caspian Flotilla – existed in the period of the intervention against Russia in 1918–1920. The task of ensuring British domination on the Caspian was assigned to Commodore D.T. Norris, the head of the British Naval Mission. The Flotilla was created out of captured merchant ships onto which armaments were installed. The Flotilla included 9 re-equipped and armed merchant ships, 4 ships with hydroplanes onboard, and 12 high-speed torpedo boats of the Queen’s Fleet transferred to Baku from the Black Sea. The Flotilla ensured permanent links between the groups of British troops scattered in Baku, Petrovsk-Port, on Chechen Island, in Fort Aleksandrovska, and in Krasnovodsk. After withdrawal of the British troops from the Transcaucasus and Trans-Caspian, B.C.F. was passed under command of the armed forces of the south of Russia (commander – General A.I. Denikin) under the command of Rear-Admiral A.I. Sergeev. After the advance of the Red Army in April 1920 on the Caucasian and Trans-Caspian fronts and going out of the Soviet Flotilla to the Caspian Sea (from Astrakhan), Denikin’s fleet had to relocate to Anzali (Iran) where its Russian crew was interned by the British command in Northern Iran.

Broadland – long bay in a river formed by an outer spit separated from the banks (northern shore of the Caspian); river bay protected from ice drifts and winds on the Volga. A convenient site for wintering or permanent berthing of ships and the estuary of bypasses, old river channels, and other places protected from the ice drift. An artificial harbor for ship berthing and repair on the Volga.

Golden and Circum-Volga broadlands in Astrakhan, Torbeev broadland, and broadlands upstream of Akhtubinsk City.

Buddhism – one of the world’s major religions (together with Christianity, Judaism, Hinduism, and Islam). It was founded in Ancient India in the sixth to fifth centuries B.C.E. and is based on the teachings of Siddhartha Gautama who is known as the Buddha, literally the *Enlightened One* or *Awakened One*. B. spread across Southeastern and Middle Asia, partially in Central Asia and Siberia, having assimilated the elements of Brahmanism, Taoism, and others. In the center of B. is the teaching of the “4 noble truths”: suffering, the arising of suffering, the end of suffering, and the way leading to the end of suffering. In the course of B.’s development, it gradually shaped the cult of Buddha and Bodhisattvas (“enlightened”), rituals, Sangha (factions) and others. The life of Buddha became known in Ancient Russia by the text “Story about Barlaam and Josaphat”. Tsarevich Josaphat, whose prototype was Buddha, became a Christian saint, and his memory is commemorated by the Russian Orthodox Church on November 19. In the territory of the Russian Federation, B. is widespread in Buryatia, Tuva, Kalmykia (in the latter, this is the official religion).

Buinak Cape – located south of Makhachkala in the Daghestan Republic, Russia. It is a small but rather wide and uninteresting cape. The cape coast is flat and covered by scarce vegetation.

Buinaksk (formerly Temir-Khan-Shura) – a regional center in the Daghestan Republic. It is located 41 km to the southwest of Makhachkala. Its population is 61.1 (2009). It is the last railway station on the side-line of the Armavir–Baku line. There are two explanations concerning the origin of its name. In the Akushinski language, “*shuran*” means a lake. During construction of this fortified outpost, the Temir-Khan Lake was dried out (now there is a park in its place), thus, this fort (in 1866, it was granted the status of a city) got its name from this lake. At the same time, in the Darginsky language “*shura*” means a cliff, Khan Timur Cliff. This dates back to the fourteenth century and is connected with the Tamerlane (he was also called Emir Timur, Timur, Timur the Lame) invasion, which made its camp in the place of present B.

In 1396, returning from his campaigns on the Golden Horde and Rus’, the Timur troops camped near a lake that was called later by local people “the Lake of Timur” – Temir-Khan-Shura. Soon after Timur with his troops went away, an *aul* (a village) appeared at this site. Later, the Avar-Kakhetin railroad connecting Daghestan with Georgia was constructed near this *aul*. In 1833, taking advantage of the beneficial geographical location near mountain passes into the internal regions of Daghestan, on the initiative of Colonel F.K. Klucki von Klugenau, it was decided to construct near a castle that should be a fortified outpost in the struggle against the highlanders here. And the Tamerlan Cliffs became the core around which the fortification was built; it was called “Kavaler-batareya.” The cannons were installed here because all surroundings were well-visible from this place. On March 30, 1834, following the highest order, the Kura chaser unit was dislocated in this castle as well as the headquarters of the Apsheron infantry regiment and military Governor. During the Caucasian War (1817–1864), the Temir-Khan-Shura castle withstood in 1843 the highlanders’ siege that lasted for nearly 2 months. In 1849 was the attack of horsemen of Hadji Murad. From 1847, Temir-Khan-Shura became the permanent residence of the civil commander in the Caspian area; in 1860, it became the center of the Daghestan Region; and in 1866, it was officially granted the status of a city. In spring 1918, Soviet rule was proclaimed in Temir-Khan-Shura, but in September 1918, it was captured by Daghestan counter-revolutionaries lead by Daghestan dictator Grand Duke Tarkovsky. On their command, in November 1918, Turkish troops went into Temir-Khan-Shura without any battle. Together with the Turks, the so-called government of the Republic of the Caucasus Mountain Peoples Union came to Temir-Khan-Shura. It declared the Turkish troops to be the troops of the Mountain Republic. The Turks were replaced with the British. For some time even the British diplomatic envoy to the Caucasus, Colonel Rowlandson, was removed from Temir-Khan-Shura. In March 1920, Soviet rule was reinstated in T.K.S., and in November 1920 at the meeting of the Daghestan people in T.K.S., the RSFSR government declared Daghestan autonomy.

In 1921, T.K.S. was renamed Buinaksk in honor of the revolutionary, Ullubiy Buinaksky (1890–1919). Until 1922, B. was the regional, then the republican center, and later on, the canton center.

After the end of the Caucasian war, the city attracted the attention of people of culture. T.K.S. was visited by many poets and novelists, such as A.I. Polezhaev, A.A. Bestuzhev-Marlinsky, artists F.T. Rubo, I.K. Aivazovsky, N.Ya. Yaroshenko, surgeon N.I. Pirogov, French novelist A. Dumas (father), Russian famous poet M. Yu. Lermontov (1840).

In the city can be found furniture, footwear, knitting, and garment factories as well as aggregate, instrument-making, tire repair, and canning plants. The Avarian dramatic theatre is here. The city was badly damaged during the disastrous earthquake of May 14, 1970. It has a functioning mosque and madrasa, both being the largest in the Northern Caucasus. B. is located in a climatic resort zone. The climate here is very warm and arid. The winter is not severe: the mean temperature in January is -2°C ; the summer is very warm and dry with a mean temperature in July of 23°C . Precipitation is 470 mm a year and falls mainly in the warm period. The climate is favorable for climatic treatment of various forms of tuberculosis.

Bukeevsy Orda (Internal Orda) – the Kazakh (Kyrghyz) khanate that existed as a vassal of Russia from 1801 to 1876. It appeared in the period of struggle for power in the *Mladshy zhuz* (old Kazakh clan). It got its name in honor of sultan (khan) Bukei Nuralimov. It was formed by the people from Mladshy zhuz (5 thou carts and about 50 thou people) that occupied the space extending between the Ural and Volga rivers in the so-called Ryn-sands and Naryn sands. They were allowed “to have camps on this side of the Ural River, between the Ural and the Volga, in order to find in the forest areas the most convenient places for camping in the wintertime.” The area of B.O. was 66 thou km^2 . In the east it bordered on the lands of the Ural Cossack Troops, in the west on the lands of state saltworks and Kundrovsky Tartars, in the north on the Saratov Province, and in the south on a band of state lands running along the Caspian coast. It was included into the Astrakhan Province.

Bulla – one of the biggest islands in the Baku Archipelago in the Azerbaijan Republic. It is located 13.3 km eastward of the Alyat Cape. It has an oval shape; its length is 2.5 km, and its width is 2.6 km. The shores of the island, except for the southwestern, are high and abrupt, surrounded by narrow sandy (in some places stony) beaches. It is covered by scanty desert vegetation. In geological terms, it is an ancient volcano with the first recorded major eruption in 1857 and the last major eruption occurred in 1940.

Bullhead-Bubyr (*Knipowitschia caucasicus*) – dwarf bullhead, up to 5.0 cm long. Occurs over the whole Caspian and in the lower reaches of all rivers. Of all bullheads it is the most euryhalinic form that is found both in fresh waters and in highly-saline sea water.

Bullhead Khvalynsky (*Neogobius caspius*) – fish species of a light-brown color. The male length is to 15.6 cm, while females are 8.5 cm; the females weigh 10.2 g, while males weigh up to 56 g. Its lifespan is 4 years. This is a marine species and it

does not go into rivers. Its habitation is mostly in the Middle and Southern Caspian. It propagates in the western part of the Middle and Southern Caspian. It feeds on fish, clam worms, mollusks, and crawfish.

Bullhead Neposledny (*Mesogobius nonultimus*) – fish species of a light-gray color. Its body length is to 15.1 cm. Its weight is 23.3 g. This is a rare species. It lives at great depths. It lays eggs in the coastal zones.

Bullhead-Tsutsik, Marble Bullhead (*Proterorhinus marmoratus*) – fish species up to 6.6 cm long and weighing 6.6 g. The lifespan is 2 years. It is found in many places in the sea, in the Volga, Kura, Ural, Kuma and Araks rivers, and also in Iranian rivers.

Bunkering – supplying vessels with fuel either in a port or when on sail. In the late nineteenth to early twentieth centuries, bunkering operations in the lower reaches of the Volga and in the Caspian Sea caused water pollution.

Buoy (Dutch “*boei*”) – a floating device that may have different forms and color for marking a maritime channel, supporting fishing nets, marking the location of underwater hazards (e.g. anchor), saving people (lifebuoy), and others. Sometimes lanterns together with internal power supply sources for additional devices for giving sound or radio signals are installed on B.

Bureau on Study of the Caspian Sea Currents – organized in 1924 within the framework of the Caspian Shipping Company in Baku. It was headed by N.N. Struisky. This Bureau has collected and processed a great number of observations over the currents using log books, “bottle mail,” instrumental measurements of currents on floating landings, and floating lighthouses. It existed until 1929.

Bus, Busa – in the fifteenth to eighteenth centuries, a vessel that sailed the Caspian Sea. It was mentioned for the first time in the Troitsky Chronicles (early fifteenth century). It has a sharp-bow, rounded-bottom, and road-board vessel with one sail. B. was equipped with spare ropes, anchors, and sails. B. was commanded by a serviceman. The crew consisted of a carpenter, two dozens shooters and gunmen, a helmsman, an ahead-looker, and a signal man. When going out into the sea, an experienced pilot was also taken on board in Astrakhan. B. had a considerable carrying capacity – more than 200 t. For defense purposes one or two cannons were installed on board. B. was constructed without iron nails; instead, pine or elm-tree spikes with rounded caps were used; instead of tar, long bast fibers were applied to bind together the deck boards. The spacing between them was stuffed with a flask tow or bast. B. was not very safe for sailing as it was not easily maneuverable. Usually B. lasted for no more than two journeys – from Astrakhan to Mangyshlak (or to Derbent and Nizabad) and back. After this, it demanded repair or a new vessel. In the seventeenth century, B. was used for merchant purposes.

Buzachi, Bozashchi – a peninsula in the northeastern part of the Caspian Sea in the Kazakhstan Republic. Its name is taken from the Kazakh “*bazashy*,” meaning

solonchaks covered by the steppe grass, suitable for cattle grazing. It is thought that “*buzachi*” was the name of some Turkmen tribes that roamed over the peninsula. G.S. Karelin noted that some time ago, B. was called Kolpin Kryazh which is connected with the Kolpins Islands that merged with B. In the south, the peninsula is traversed by hills, while in some places it is covered with ridge-honeycomb sands. The northern part is covered by extensive solonchaks. In the south, B. borders on the mountains of the Mangyshlak Peninsula. The B. area varies significantly depending on the water fluctuation in the Caspian. Many drainless sors 10–15 m deep are met. In the northwest of the peninsula, the beach ridges are 0.5–0.7 m high and beach dunes are striking.

Buzan, Buzan System – an arm separated from the Volga 46 km northward of Astrakhan; more downstream, it partially joins the Akhtuba farther on, breaking into several small channels. It flows into the Caspian Sea. Its length is 126 km. This is the largest riverbed system in the Volga delta. B.S. covers nearly half of the delta area and comprises nearly the half of all its water streams. It is fed by the Buzan arm, originating in the delta top and also by the Akhtuba and intermittent streams in the Volga-Akhtuba floodplain. Within B.S., the Volga waters run along the following main directions and waterways (from east to west): Buzan (and Akhtuba)–Kigach–Sumnitsa Shirokaya–Igolinsky bank; Buzan–Obzhorova arm; Buzan–Churka–Karaisky bank; Buzan–Sarbai–Malo-Belinsky bank; Buzan–Shmagina–Shaga–Bushma-Belinsky bank.

Buzovna – a sea climatic resort in Azerbaijan. It is part of the Apsheron resorts group. It is located on the northeastern coast of the Apsheron Peninsula, 37 km to the northeast of Baku with which it is connected by an electrified railroad. Its population is 25 thou (2008). The resort has a mild climate, warm sea, and sandy well-equipped beaches that are used for climatic-thalasso therapy. This resort offers iodide-bromine and sulfide baths with mineral waters from the Surakhan sources as well as naphthalan curative baths, etc. The resort provides treatment for people with diseases of the nervous system, locomotive system, lungs, and gynecological diseases. Sanatorium “Khazar” and a tourist area can be found here. A plant producing gas facilities and oil production are also found near B. Vegetables and melon crops grow here.

Buzun – an insoluble salt used in dishes with salty fish. For example, herring on buzun.

C

Cabotage, Coastal Navigation – (Fr. *cabotage* der. of *caboter* – “navigate along the shores”) – navigation (freight and passenger carriage) between the ports of a state. They distinguish between long-range C. – freight carriage between ports in different seas – and short range C. – traffic between the ports in the same sea (e.g. Baku – Astrakhan).

Cane Thicket, Cane Banks – cane and cat’s tail thickets in the kultuk area. Cane thickets begin from Biryuchya Spit in the western part of the Volga Delta and constitute a solid tract spreading along its sea edge as far as the most distant eastern arms in Kazakhstan. Their length from the southwest to the northeast is around 200 km, and their width does not normally exceed 15 km. In the central part of the delta, the cane belt grows narrow, delimited on the north by agricultural lands. In the Northern Caspian, C.T. proliferate through formation of peculiar cane “islands,” which are not infrequently ring-shaped; subsequently, as the “islands” increase in size and form large tracts, they ultimately merge with the bank thickets.

Caravan Routes (Pers. *caravan* from ancient – Iranian *caraban* literally – “trade security”) – transport routes (natural roads or tracks) in desolate and other rough (mainly, mountainous) areas used for the carriage of cargoes and humans by means of caravans (groups) of pack animals (mostly, camels, donkeys, and horses). In the past, used to be important trade routes (the famous Great Silk Road). As rail, motor, and air transport developed, CR lost their traditional significance and are used at present for domestic communication only (Iran, North Africa, and other countries).

Caspi – name given to the Caspian Sea in Turkmenistan.

Caspian-Aral Channel – see *Caspian Sea – Aral Sea – Channel (Casparal)*

Caspian Area (Oblast) – instituted in 1840 on the territory of Eastern Transcaucasia that became part of Russian Empire under the Gulistan Peace Treaty of 1813. Regional center is the City of Shemaha. Provinces: Derbentsky, Kubinsky, Shekinsky, Shemahansky, Bakinsky, Shushinsky, and Lenkoransky. In 1846, C.A. was abolished, and the territory was divided into the Shemaha and Derbent Governments.

Caspian Area of Sedentary Farming – one of the areas of sedentary farming development identified on the basis of analysis of paleoethnobotanical materials. It belongs to the Near Asian source of origin of the most important cultured plants identified by N.I. Vavilov and developed on the basis of the Turkmen-Khoransan province. At the same time from this source, the Area took a peripheral position at the juncture between the Near Asian and Middle Asian sources, which was reflected in the specific development of the early forms of farming in this region. Remoteness of the Caspian from major ancient farming centers made it isolated both culturally and historically. The people here settled widely in piedmont and foothill plains. Still practicing gathering and rainfed farming, they also had conditions for application of the most primitive forms of artificial irrigation and transition to a qualitatively more effective agricultural system. The Area covers a territory of Southern Turkmenistan from the Caspian Sea coast in the west to the valley and the sub-aerial delta of the Murgab River in the east and also a part of Northern Iran with Elburz and its northern piedmonts, the Gorgan-Atrek Lowland and partially Eastern Khorasan.

Caspian Autochthonic Fauna – includes approximately 100 endemic brackish water species of animals evolved in the Caspian after its separation from the World Ocean about 6.5 million years ago in the Balakhansky Time (Balakhansky relics) and about 3.4 million years ago in Akchagylysky Times (Akchagylysky relics).

Caspian Barbell (*Barbus brachycephalus caspius*) – migratory fish 45–103 cm long and weighing from 0.9 to 14.5 kg. Its lifespan is 13 years. It feeds on river crayfish and the larvae of insects. Its commercial significance is not high.

Caspian Bighead Goby (*Neogobius kessleri gorlap*) – fish with 61–71 parallel rows of scales and coloring from grayish-brown to greenish. It has dark-brown spots on the body and 5 large dark spots noted on the sides. A triangular spot is on the caudal fin. Its length is 20 cm, and its mass is 59 g. It is 2–3 years at sexual maturity. It inhabits the Caspian coastal zones, the Volga delta, and the Lower Terek lakes, and feeds on fishes, crustaceans, and mollusks.

Caspian Border Flotilla – established in 1924, it performed combat patrol functions on the line Kura roads – Sara – Lenkoran – Astara and along the sea frontier of Soviet Azerbaijan.

Caspian Campaign of Stepan Razin – see *Persian Campaign of Stepan Razin*.

Caspian Caviar-and-Balyk Production Association – established in 1964. It has three stationary caviar-processing shops at the delta fish-processing enterprises built in 1965–1966 in the Oranzhereiny and Kirovsky settlements and in Astrakhan. From 1966 to 1974, 7 floating caviar plants were built. The Association has a special, motorized fleet for the delivery of caviar and fish from particular production areas. CCBPA takes delivery of almost all of the sturgeons fished on the Caspian Sea (except from Iran). The Association fabricates highly-valuable delicacy products of large assortment: black caviar and balyk items. In 1995, CCBPA was privatized and reorganized into the Open Joint-Stock Company (OJSC “Russian Caviar”).

Caspian Chain – the southeastern area of the Greater Caucasus (to the southeast of Babadag Mt.); a major orographic unit of the Caucasus that is sometimes referred to as such.

Caspian Climatic Region – distinguished by such criteria as special features of atmospheric circulation, thermal regime, atmospheric precipitation regime, and air humidity. CCR is situated within the following boundaries: from the Volga delta to the Emba delta the boundary runs along the coast of the Caspian Sea some 30–40 km from it, determining the zone of breeze circulations. To the south of the Emba delta, sticking to border escarpments, there is the Plateau Ustyurt, including Mangyshlak Peninsula. Farther to the south, the boundary runs along the northwestern and western border that limit the Kara-Bogaz-Gol Bay basin on the east, continuing on via the Krasnovodsk Plateau and the Greater and Minor Balkhan Ranges, reaching the northwestern termination at the advanced ridge of Kopet-Dag.

Here, the CCR boundary hems the basin of the Atrek and Gorgan Rivers. It turns west to the east of the Iranian city of Kuchan, stretching to the south along the ridges of Aladag and Elburz. In the west, the boundary passes along the Talysh Ridge, the water divide of the Minor Caucasus Ridge, and along Kartalinsky Ridge reaches the Greater Caucasus, transverses it, and reaches Astrakhan along the western fringe of the Circum-Caspian Lowland marked by the Stavropol Upland.

“Caspian Crossroads” – a quarterly analytical journal dealing with problems of economy, geopolitics, and law of the countries of the Caspian Region, Caucasus, Central Asia, Turkey, and Iran. Published in English in the USA by the USA-Azerbaijan Council.

Caspian Depression – extending from the piedmonts at the southern end of the Ural Ridge (in the northeast) to the Volga (in the west) and from the southern off-spurs of the Obschyi Syrt (in the north) to the Northern Caucasus. It covers the southeastern part of the vast Russian platform. C.D. is a large structure with very deep occurrence (to 20–23 km) of the pre-Paleozoic – Lower Paleozoic basement and a rather complicated structure of the thick platform part of a profile. It abounds in saline domes. In the south and southeast, the C.D. margins are limited by a large deep fault making a border between this depression and the Turanian plate located more to the south. C.D. coincides mainly with the Caspian Lowland; however, the relief border between these large geomorphological elements does not correspond to the geostructural border.

Caspian Environmental Program, Environment Program of the Caspian Sea (CEP) – developed by the World Bank, United Nations Development Program (UNDP), and United Nations Environment Programme (UNEP) in coordination with the governments of the Caspian Sea countries during the concerted mission of the Circum-Caspian states in April of 1995. The results of the mission were used by the EU/TACIS Program and the World Bank in 1997 for the development of the concept of the international CEP associated with the establishment of

a regional framework providing for cooperation in the field of nature conservation. Since 1998, this has been a major form of international cooperation in the area of nature conservation.

CEP's major goal is to assist sustainable development and rational environmental management in the Caspian Sea Region. CEP's main components are as follows: improvement of institutional arrangements and procedures (including normative-and-legal matters); coastal zone management under the conditions of sea level variability; preventive measures and elimination of environmental pollution; monitoring and data management systems; biodiversity conservation; a bioresources management system; and enhancement of problem awareness and public participation. The aforesaid components are implemented by the appropriate Caspian regional subject-matter centers (CRSMC). In fact, CEP is a system of institutional arrangements that make it possible to determine for Caspian countries the algorithm of cooperative actions toward resolving the problems of Caspian environment with the assistance of international organizations. The institutional and financial support of their activity is provided by TACIS, the Global Environmental Foundation (GEF), and UNEP.

One of CEP's objectives in the initial phase was the development of adequate institutional procedures for interaction. CEP is managed by the Steering Committee, coordinating office, and national intersectoral coordinating bodies. CEP's principal activity is performed by experts and consultants. There were CRSMC established for sustainable management of aquatic bioresources and for institutional legal and economic procedures of environmental management – Russian Federation (EU/TACIS, UNDP/GEF); for pollution control and for information database management – Azerbaijan (EU/TACIS); for integrated management of coastal zones and for emergency response – Iran (World Bank, UNDP/GEF); for the study of sea level variability and biodiversity conservation – Kazakhstan (UNDP/GEF); and for combating desertification and degradation of coastal lands and for sustainable development of population and public health – Turkmenistan (UNDP/GEF, EU/TACIS).

The main results of CEP's CRSMC activity during the first phase was the drafting of the regional Plan of Action for the countries of the Circum-Caspian Region on response to emergencies, especially oil spills; the national reports on biodiversity in the Caspian Region and regional overview of the draft national Plans of Action on Habitats Conservation; and the Draft Caspian Regional Strategic Plan of Action on Biodiversity Conservation. Additionally, among the main results of the CEP first phase, it is necessary to note, above all, the preparation of Transboundary diagnostic analysis, of draft national Caspian Plans of Action in particular countries, of the draft Caspian Strategic Plan of Action, of preparation of a package of investment projects within the framework of minor joint grants component, and of a priority investments portfolio, including establishment of the Caspian Information System. The Programs first phase concluded in 2003.

Caspian Floating University, CFU Program – in 1997, the Caspian Research Institute of Fisheries at the 10th International Conference on Fisheries Oceanology,

while supporting the scientific-educational program of the IOC (Intergovernmental Oceanographic Commission)/UNESCO “Floating University,” advanced the initiative for setting up a Caspian component of the program. The initiative was welcomed, a response reflected in resolutions of the 20th session of IOC Assembly on the Caspian Sea (Paris, 1999). The concept of the “Floating University” Project is education through research, a fundamentally new approach to the study of the Caspian Sea ecosystem. Its main task, along with research and obtaining updates on the marine ecosystem, is to guarantee the enhancement of professional levels of young scientists, to bring them up in the spirit of international cooperation in conserving and rationally using the Caspian Sea’s natural resources. CFU is an international program of the Caspian states and is open for the participation of all countries concerned (research and educational institutes, chairs and laboratories, scholars and subject-matter experts). CFU publishes a scientific bulletin.

“Caspian Gate” – (1) narrow coastal strip of the Caspian Sea near Derbent, Daghestan. It has been known through history as the only convenient natural route for passage from the North Caucasus steppes to Transcaucasia and the Middle East. The strategic significance of this site at the junction of roads laid along the sea and leading to the mountains had, for centuries, made Derbent an object of offensives by the Scyths, Huns, Hazars, Persians, Arabs, and Turks.

CG was first mentioned by Hekatei of Miletus in the fourth century B.C.E. and was also used by numerous classical authors. For example, Khares Mitilensky (fourth century B.C.E.), on the basis of ancient traditions in connection with the events of the eighth and seventh centuries B.C.E., wrote that “Histasp was in possession of Midia and the lower country, while Zariadr owned the area above the Caspian Gate as far as Tanaid.” Diodore Sicilian has this mention: “A rather narrow passage called the Caspian Gate.” The expression “Caspian Road” can be found in Publii Cornelius Tacit, and “Caspian Gate” is mentioned by Josephus Flavius, Pliny the Elder, Casius Dion, Elius Aristide, and many other authors. It should be noted that the passage got its name not from the Caspian Sea at all, along which it used to run, but from the Turk-Language tribe of Caspians who lived in that region. Later, in written sources other names of this passage are encountered, including “Albanian Gate,” “Albanian Passage,” “Derbent Passage,” “Hun Gate,” and others.

(2) “CG” is used by Tacit and Flavius to denote Daryal Canyon.

(3) Mountain pass to the east of Tehran that leads via Elburz Range to the Hirkan District of Caspiana.

(4) Sea gate, Darband Gate (*Dar-i-mir-mitra*) – Gate of Peace and War, Joor Gate (Jor), Bab-al-Abwad (Arab.), Damir-capy (“Iron Gate” – Turk.). It is believed that in ancient times the southwestern part of the Caspian Sea, where Caspiana was, used to be called Caspian Gate.

Caspian Highway – a coastal road connecting all littoral cities on the Iranian coast of the Caspian Sea.

Caspian Higher Naval School – established in 1939 in Baku for training highly-skilled officers and named after S.M. Kirov. The Caspian Naval Flotilla was

instrumental in proper establishment and functioning of this educational institution. The flotilla provided facilities for the cadets of the CHNS to have proper practice. The school trained captains, navigators, marine engineers, sonar operators, and other specialists. In 1957, "CHNS Transactions" began to be published.

Caspian Institute of Biological Resources – organized in 1972 in Makhachkala on the basis of the Biological Division of the Daghestan Branch of the USSR Academy of Sciences. The Institute gained the status of the Daghestan Research Center of the USSR Academy of Sciences on June 20, 1991. CIBR is the center of biological research in Daghestan. It consists of 3 divisions uniting 8 structural research subdivisions: division of soil and plant resources, division of marine and land ecosystem stability, and biotechnological division. The CIBR structure also includes the Kochubei biosphere station and the marine biological station. The Institute publishes the journal "Arid Ecosystems."

Caspian Lowland – located in the southeast of the East-European Plain on the northern coast of the Caspian Sea, it is limited in the north by the Obschyi Syrt, in the west by the Privolzhsky Upland and Ergeni, and in the east by the pre-Ural and Ustyurt plateaus. It extends over the Astrakhan Region (Russia), West-Kazakhstan, Atyrau, and Mangistau Regions (Kazakhstan), and its area is about 200 thou km². It has a low-elevated smooth surface that gently slopes towards the Caspian Sea. Its inner southern part is 28 m below the ocean level, while towards the margins the elevations increase to 100 m. Several uplands are found here, such as the Indersky Mountains, the Greater and Lesser Bogdo, and others. C.L. includes several large tectonic structures (pre-Caspian syncline, Ergeni uplands, and Nogai and Tersk depressions). In the Quaternary period it was flooded more than once by the Caspian waters, and as a result, the northern part is composed of clay and loam deposits and the southern part of sand deposits. The surface of C.L. is characterized by the presence of micro- and meso-relief forms like flat-bottomed depressions, lagoons, bars, ravines. In the south are eolian forms and along the Caspian coast a belt of Baer's hills. The climate is dry and continental. The mean temperature in January is from -14°C in the north to -8°C on the coast, while in July it ranges from +22°C to +23°C, respectively. Precipitation from 200 to 150 mm in the south-east to 350 mm in the northwest is expected yearly, though evaporation takes about 1,000 mm. Dry winds are quite frequent here. C.L. is crossed by the Ural, Volga, Terek, and Kuma rivers and by such smaller rivers like the Greater and Lesser Uzen, Uil, and Sagiz. In summer, these dry out or break into various depressions forming such lakes as Kamysh-Samarsky and Sarpinsky. Many saline lakes are here, including Baskunchak and Elton. The soils and vegetation of C.L. are characterized by great complexity. The soils are light-chestnut and solonets-like, though solonets and solonchaks are also met here. In the north, a wormwood-cereal vegetation prevails, while in the south the cereal vegetation decreases giving space for wormwood. These areas are used as pastures. In the Volga-Akhtuba floodplain vegetable, melons and horticulture have been developed. There are also oilfields (Emba oil region) and table salt deposits in the Baskunchak, Elton, and other lakes.

Caspian Marine Depositional Plain – a regional geomorphological unit (area) in Turkmenistan, a part of the West-Turkmenian Lowland. It surrounds the Caspian Depression and is broken into the Karabogazsky, Oktukumsky, Pribalkhansky, Okoremsky, and Atreksky regions by structure, origin, morphology, relief orientation, and other features. Having intruded deep into the Karakums, the Akchagylsky transgression created terraces at an elevation of about 90 m. In Khazar times, the Dardja sands accumulated between the Akta-sea and Krasnovodsk Bay. The Khvalynsky Sea filled and extended by abrasion the sors-deflation depression of Kara-Bogaz-Gol, continuing far into the western Karakums between the Greater Balkhan and Kopetdag up to the meridian of Kyzyl-Arvat, approaching the western piedmonts of the Kopetdag. In the Karakums, its traces were eliminated practically in full by the winds, while in other places some pebble and sandy bank levees and marine terraces were left. On the Krasnovodsk Peninsula, the sea built up the presently fixed sandy area of Oktukum; in the pre-Balkhansky etrap, barkhan sands of the Kyzylkums and Barsa-Gelmes; in the southeastern coast, the sandy area Seyunagsak and flooded the flat clayey proluvial-deltaic Messeriansky Plain. In the Holocene during the Novocaspian transgression were formed in their present shape the Karabogaz and Cheleken spits, the surface of the Cheleken Strait and solonchak Kelkor, the waterlogged and saline Atrek Plain, which is composed not so much by the deltaic sediments of Atrek, but more by the sea-washed sandy-silty and detritus marine sediments. The depositional plain has some isolated uplands, including the tops of the barkhan anticlinal folds that were formed still the Pliocene (Chokrak on the Cheleken, Nebitdag, Boyadag, Mondjukly and others). Sandy ridges 30–60 m high in the Barsa-Gelmes stretching at times for dozens of kilometers from north to south are broken by sandy solonchaks 1–2 km wide. They have one talus slope of western exposition to 150 m long. Mud volcanoes are very numerous in Southwestern Turkmenistan, signalling of oil and gas deposits in this region. A group of bald mountains Kainak, located 5 km from Esenguli, spews gas and dense mud constantly. In the Keimir bald mountains, the diameter of one of the craters is as large as 85 m. The large mud volcanoes Akpatlavuk (Belaya) 60 m high and Gekpatlavuk (Zelenaya) 95 m high are active. The presently dead volcano Gograndag rises 107 m over the Caspian.

Caspian Military Flotilla – oldest of the Russian military flotillas, the first ship for the Caspian Sea “Orel” (“Eagle”) was built in 1677–1668 as part of the Russian Navy. CMF established by order of Peter I in 1722 in Astrakhan. In November of 1722, a decree was issued ordering the construction of a naval port at the point of confluence of the Kutum River with the Volga in Astrakhan. The decree read: “To maintain an admiralty and admiralty servicemen at the Astrakhan Port for military service, and for this purpose build barracks at a specially chosen site.” The Governor of Astrakhan, A. Volynsky, was ordered to establish a pilots’ station in the Volga delta near Four Mounds.

CMF participated in the Persian Campaign of 1722–1723 with 80 large ships and a Marine unit. CMF occupied Derbent Fortress (1722) and Baku Fortress (1723). In the mid-eighteenth century, the ships of the flotilla cruised the central part of the

Caspian Sea, providing for the safety of merchant shipping. During the Persian campaign of 1796, CMF delivered troops and ammunition. In 1800, an interim naval base was established near Sara Island (marine station) to protect the trade routes and Russian interests in the region. CMF took part in the Russian-Persian war of 1804–1813. At the beginning of the Russian-Turkish war of 1828–1829, CMF defended Derbent, Baku, and other cities; interim naval bases were set up on Anzali and at Ashur-Ade Island. From 1867, the main base was in Baku. By 1914, CMF had Baku Naval Port, Astrabad Marine Station, 4 ships, and 2 gunboats. After the Revolution of 1917, CMF took an active part in establishing the Soviet power. In February of 1918, along with CMF, the Navy of Astrakhan Territory became the Astrakhan-Caspian Naval Flotilla. The flotilla fought against the White Guard and British interventionists in the Circum-Caspian area. In 1919, the Astrakhan-Caspian Flotilla and Volga Naval Flotilla were united into the Volga-Caspian Naval Flotilla. It operated in the lower reaches of the Volga, defending Astrakhan from sea strikes of the British and Denikin Flotillas. On its basis, Naval Forces of the Caspian Sea, with the main base in Baku, were established in July of 1920. In 1931, Naval Forces of the Caspian Sea began to be called CMF. During the years of the World War II, the flotilla made provisions for military shipments for the Battle of Stalingrad and the Battle for the Caucasus. In 1945, CMF was awarded the Red Banner Order for feats of arms in the Civil War and World War II. In 1992, following the collapse of the USSR, CMF was split between Russia and Azerbaijan.



Caspian navy fleet (Russia). Warship «Tatarstan» (http://www.lada.kz/uploads/posts/2008-09/1222689655_dscn1333.jpg)

Caspian Monkey Goby (*Negobius fluviatilis pallasii*) – fish with 49–61 parallel rows of scales and a body that is narrow and long, of brownish-gray or yellowish color. The snout is pointed. Its length is up to 9.9 cm and its mass is 22.8 g. Its sexual maturity is attained at the age of 2, and its lifetime is 5 years.

Propagates in fresh and saline water, and inhabits the Volga and Ural deltas and the Lower Terek lakes. Feeds on fish, clam worms, crustaceans, and mollusks.

“Caspian Monster” – see *“Monster of the Caspian”*.

Caspian Mountains – common name of the Caucasus Mountains, especially of the Main Caucasian Range, used by the European authors in the thirteenth to fourteenth centuries.

Caspian Nautical Scientific Research Center – established in 1995 in Astrakhan pursuant to Decree of the RF Government dated February 10, 1994 as a state institution of Russia’s Federal Service for Hydrometeorology and Environmental Monitoring (Roskomgidromet). The center researches hydrometeorology, oceanography, and Caspian Sea pollution; provides uniformity for carrying out marine hydrometeorological online observations and participating in integrated online monitoring of Caspian Sea environment pollution; and prepares information and forecasts on the state of the Caspian Sea and marine estuaries of the rivers.

Caspian (North-Caspian) Oil and Gas Province – one of the world’s oldest oil producing regions. Geologically, this province is located within one of the world’s largest and deepest platform depressions, the pre-Caspian syncline. It represents the southeastern margins of the Russian platform. Administratively, this province covers the Atyrau, Ural, and Aktyubinsk Regions of Kazakhstan and also the Kalmykia, Astrakhan, Saratov, and Volgograd Regions of the Russian Federation. Its area is approximately 500 thou km². The maximum thickness of the sedimentary mantle is over 20 km. According to survey results, the pre-plate Riphean-Vendian complex reaches the central part of the province at a thickness of 8–10 km. The orthoplatform cover includes from the Lower Paleozoic to Quaternary deposits. In the sedimentary mantle are two large oil-gas-bearing megacomplexes: subsalt and oversalt that are divided by the Kungur salt-bearing series. The profile of the sedimentary mantle is exposed by drilling beginning from the mid-Devonian deposits. It is broken into large structural formation complexes: Quaternary–Pliocene, Miocene–Paleogene, Cretaceous, Jurassic, Triassic, and Permian (Tatarian-Philippian), corresponding to the oversalt megacomplex and the Artinsky-Eifelsky corresponding to the subsalt megacomplex. According to geophysical surveys, the thickness of the subsalt megacomplex varies from 3 to 4 km in the sidewall zones of the Caspian syncline to 10–13 km in its central areas.

The oversalt megacomplex contains the lower Cretaceous, Jurassic, Triassic, and upper Permian formations, while the subsalt megacomplex contains the lower Permian, Carboniferous, and Devonian formations that comprise commercial-scale oil and gas reserves.

The study of oil and gas in the province is not uniform. The oversalt deposits are studied rather well, but in the recent 2 decades the subsalt Paleozoic deposits in the province have become the main area for oil and gas prospecting. The subsalt complex is penetrated within a wide stratigraphic range by numerous deep wells in its southeastern part, including Tengiz, Tajigali, Tortai, Sholkara, Imashevsky, Biikjal,

Korolevskaya, Ulkentyube, Ushmola, Tabynai, Elemes, Saztyube, and Sarybulak. Here some unique oil and gas fields of commercial significance have been discovered. There are also signs of oil and gas presence in various scales. Judging by the intensity of the geological structures and the oil and gas presence in the subsalt complex, the Primorsky, South-Emba, Biikjalsky, North-Caspian, Astrakhan among other gas-bearing formations were found in the sidewall zone of the province.

Caspian Oil Company – established on July 25, 2000 by bringing together the fuel companies YUKOS, LUKOIL, and RAO “GAZPROM”. COC’s terms of reference include exploration and development of oil fields in the northern part of the Caspian Sea and in Kazakhstan’s near-border areas. The establishment of COC was necessitated by the growing investment opportunities and minimization of risk for operations in the Caspian Region. Each of COC’s promoters has 1/3 in the charter capital. COC is headquartered in Astrakhan.

Caspian Ordinary Kilka (*Clupeonella daliatula caspia*) – subspecies of common kilka. Its length is 14–15 cm, lifetime under 6 years, and fat content in body up to 12%. Number of vertebrae is 41–45.

COK normally winters in the Middle and Southern Caspian, and in March it goes to the Northern Caspian, coming up to the shores when water temperature is between 6 and 14°C and partly entering the Volga and Ural deltas. Spawning in the Northern Caspian is in full in April-May, at a temperature of 12–21°C. As kilka approaches the shores, it forms huge groups that fill the entire coastal shoal with a continuous band. Kilka then returns to high sea just as quickly, where it remains in the 6–30 m layers, sometimes going down to a depth of 100 m.

Caspian Ornithological Station – established within the framework of the Astrakhan Reserve in 1968. Its goals were to study wetlands and bird biology throughout the Volga delta and on the Caspian shores and to develop a system of measures towards conservation, reproduction, and rational use of the bird resources. Practical orientation of these studies is conditioned by the fact that Volga delta’s lower reaches, including Astrakhan Reserve, are of international significance to waterfowl habitation.

Caspian Pipeline Consortium – established on July 17, 1992 pursuant to the Agreement between the Government of Kazakhstan and the Sultanate of Oman. In June of 1993, Russia acceded to the Agreement. CPC is designed for oil transportation from Tengiz Field (Kazakhstan) to the Yuzhnaya Ozereevka Terminal near Novorossiisk (RF) on the Black Sea. The total design length of the pipeline is 1,580 km, with a maximum carrying capacity 67 million tons of oil/annum (initial – 28.2 million tons). The cost of the pipeline is USD 2.3–2.4 bn. For the first time, Russian offshore oil loading into tankers with the aid of single-point mooring was envisaged. In 1994, the Russian Federation handed over to the CPC the existing system from the Russia-Kazakhstan Border to Kumbator, including the 40-inch 502 km-long pipeline as well as the oil pumping stations “Astrakhanskaya” and “Komsomolskaya.” At the insistence of the US oil company “Shevron,” recovering

oil from Tengiz Field in association with Kazakhstan, and of Russian organizations, CPC was redesigned to become CPC-2 in March of 1996. As a result of this, the share of the Sultanate of Oman fell from 50 to 7%, and a group of companies, including Russian ones, was admitted in CPC. Besides, 50% of the shares went to the producer companies: “Ajip” (Italy), “British Gas” (Britain), “Oryx”, “Mobil” (USA), “LUKArco” and “Rosneft-Shell.” This structure was legitimated by a package of documents signed in December of 1996 that included the Intergovernmental Agreement on CPC Reorganization (signed by Kazakhstan, Russia, and Oman), the Agreement on setting up the CJSC “CPC-R” (Russia) and “CPC-K” (Kazakhstan), and other documents. Kazakhstan handed over in 1998 the existing pipeline system from the Tengiz Field to the Kazakhstan–Russia border, which comprises a 364 km long 40-inch pipeline and an 88 km long 28-inch pipeline and “Tengiz” Oil Pumping Station. The oil pipeline route was laid via Astrakhan–Komsomolsky–Budennovsk–Kropotkin–Tikhoretsk and then joined to the existing oil pipeline as far as Novorossiisk (Yuzhnaya Ozereevka). The CPC work scope components included construction of the 40-inch 580 km long pipeline from the Oil Pumping Station “Komsomolskaya” to Kropotkin and of the 42-inch 258 km long pipeline from Kropotkin to the new tank farm in the vicinity of Novorossiisk. The tank farm includes 4 oil-storage tanks, each of which has a 100 thou m³ net capacity. The construction of the pipeline commenced in 1999 and began operating in 2001. The pipeline will be online for 40 years.



Caspian pipeline consortium (http://peterfainton.typepad.com/photos/uncategorized/2008/08/15/oil_pipeline_caspian_sea.jpg)

Caspian Region – this notion has gained popularity and has been used actively after the USSR was disbanded. Yet until now the term has no clear definition that would provide an comprehensive characterization of the region's territory. As a rule, the region includes a broad geopolitical sense of 5 countries situated on the shores of the Caspian Sea proper: Russia, Kazakhstan, Azerbaijan, Turkmenistan, and Iran. A narrow interpretation of the term may be confined to the boundaries of the administrative units of the aforesaid countries that border the Caspian Sea proper.

CR is a region of historic rivalry and historic cooperation. At different times the region was the area of confrontation among the local countries and a zone of mutual trade relations. The region was on the Great Silk Road. During the nineteenth and early in the twentieth century, great powers competed here in their struggle for colonial possessions and spheres of influence. Throughout most of the twentieth century, during the Soviet period, the Caspian attracted little attention as it belonged to 2 states: USSR and Iran, between which political and legal problems had been settled effectively by the intergovernmental treaties of 1921 and 1940.

Since 1991, the current political map of CR has taken shape here.

CR is closely related to the countries of the Caucasus and Central Asia and for this reason it has become a place of geopolitical interests for many countries worldwide. As it did 100 years ago, it attracts close attention due to its lucrative geographical position, considerable reserves of hydrocarbons, unique biological resources (including the world's largest stock of sturgeons), intersection of transport routes whose subsequent development is likely to affect both the region as a whole, and its constituent countries.

CR is an important strategic link between the North and the South – Russia and Persian Gulf – and as a source of oil and gas for the markets of Europe in the west and to countries in to the southeast.

The disintegration of the Soviet Union, the emergence of global economic systems, and serious structural changes in international relations have had critically changed the world status of the region and its importance to Russia.

CR is now going through the initial stage of its formation. Its countries are in the process of forging their statehood, transforming and restructuring the rudiments of economic management, and democratizing public life. All these processes are being affected at different rates based on diverse principles that condition the existing socioeconomic status of the Caspian states. The CR countries that have gained independence are now recognized by the international community, and each of them has shaped its own system of relations with the world at large in politics, economics, and other spheres. The independence of the newly-independent states (NIS) has changed the situation in the post-Soviet area dramatically and calls for the restructuring of international relations, which will lay the foundation for a new stage in the historical development of the Caspian Region.

NIS as well as Iran and Russia have begun to formulate their regional policies; however, the geopolitical vacuum was not filled overnight. The ample hydrocarbon resources (oil and gas) were the crucial factor that pinned attention to the region; hydrocarbons were also a substantial economic tool that has determined the geopolitical situation in CR.

CR is a zone of investment interests as well as of economic and political differences that relate, above all, to determining the international legal status of the Caspian water body. Russia, in conjunction with Azerbaijan and Kazakhstan, has made quite promising steps in settling this issue, using the formula “we limit the seabed for subsoil use – the water is a common resource.”

The prospects of CR development are in large measure connected with the consolidation of relations among the local states and their cooperation in solutions to the problems of mutual interest. Such problems – economic, environmental, demographic, and political – are quite numerous.

CR to Russia is one of its foreign-policy priorities. This is a region of traditional Russian interests, crucial to economic development of the country's south. The significance of this region with its enormous reserves of oil and natural gas has forced the leading countries of the West, with the USA at the head, to determine their stands on a number of regional problems. Using different forms, methods, and instruments of penetration, these countries have tried to establish control over the space occupied by the Caspian Region, and, above all, over the energy wealth.

Caspian Research Institute for Fishery (CaspNIRKh) – Federal State Unitary Enterprise established in Astrakhan on the basis of the Ichthyological Laboratory set up in 1897 that dealt with the study of plankton and benthos of the northern part of the Caspian Sea. This was Russia's first fishery-research institution. In 1927, the laboratory was reorganized to become the Astrakhan, and in 1930 the Volga-Caspian Fishery Station. In 1948, the station was reorganized into the Caspian Basin Branch of the All-Union Research Institute of Sea Fisheries and Oceanography (VNIRO), which was reorganized in 1954 to become an independent Caspian Research Institute of Sea Fisheries and Oceanography (CaspNIRO). In 1965 it was renamed CaspNIRKh. The Institute develops the scientific fundamentals of conservation and rational use of bioresources of the Caspian Sea basin. These developments are carried out in close cooperation with other fisheries research institutes of the Caspian states. CaspNIRKh (1) performs ecologic monitoring in the Lower Volga and the Caspian Sea to systematically study the hydrology, hydrochemistry, toxicology, sanitary-and-epizootic situation, physiology, and biochemistry of fish, including their food base as well as the development of practical measures and recommendations for reducing the adverse effects of human activity; (2) makes an assessment of the state of fishing grounds reserves and of the overall permissible yields; (3) develops biological substantiation of the Fishing Regulations;

(4) determines the contribution of particular states, republics, and regions in the reproduction of raw material resources; and (5) studies the environment of the Caspian Sea basin and its impact on bioproductivity and the state of hydrobionts. New problems have emerged lately, including rising sea level, escalation of oil recovery, depredation of sturgeons, interstate conflicts in management of fisheries, conflicts in determining the legal status of the sea, etc. Commercial sturgeon-rearing is a promising line.

CaspNIRKh is the largest research and methodological center on the Caspian Sea. It has 18 laboratories and research departments based in Astrakhan, laboratories in Volgograd, and a division in Makhachkala. The Institute has its own fleet of research ships (over 20 vessels, out of which 9 are for operations on high seas). In 1997, the institute obtained a new ship, “Issledovatel Kaspiya” (“Caspian Researcher”) on which international expeditions study the hydrology and food base of the sea and assess kilka and sturgeon reserves. The institute also has a scientific library and a museum, which was founded more than 100 years ago. The museum has a collection of numerous exhibits displaying the ichthyofauna of the Caspian Sea.

Caspian Reserve – regional ecological reserve with an area of 39,400 ha. established in 1975. Situated in the northwestern part of the maritime strip, Lagan District, Republic of Kalmykia. It includes the segment of Circum-Caspian Lowland that is crossed latitudinally by Baer’s hills and the intermound space occupied by lakes and ilmens. Ryzhkovskoe, Bibinskoe, Laganskoe, Atrykskoe and Bagranginskoe lakes, that were ephemeral in the past, became now the source of water for the Olya-Caspian Canal. Krasinskoe and Olenichevskoe Lakes are connected to the Olenichevsky Canal of the Caspian Water-supply-and-Irrigation System. CR is occupied by white wormwood-brittle-wheatgrass steppes. The hollows between Baer’s hills are occupied by arborescent-saltwort, woolly-saltwort and ephemeral saltwort deserts. Flooded areas (plavni), exhibiting cane-cattails and bulrush, are strung along the banks of canals and storage reservoirs. The coastal zone displays meadows of mean and excessive moistening: quickgrass, foxtail, sea lavender-quickgrass, and others. It is a place of nesting, fly over, and rest of migratory birds and for the wintering of waterfowl. The republic’s largest pheasant population dwells in CR.

“Caspian Riviera” – expression used with reference to the mountainous part of the Caspian Sea’s Iranian shore, situated along the sea below Rudesser Village, as far as the City of Horremabad.

Caspian Rose – name often given to the lotus flower growing in the Volga delta and Kyzylagach Bay.

Caspian rose (lotus)
(<http://www.astradelta.ru/img/lotus2.jpg>)



Caspian Round Goby (*Neogobius melanostomus affinis*) – fish with a high head, small mouth, and a black spot on the first dorsal fin. It has 42–53 parallel rows of scales. The body is of brownish color. The abdominal fin almost reaches the anal opening. Maximum size of males is 16 cm, while females reach 20 cm, with a mass of 60 g. Their lifetimes are up to 3 years in males and up to 5 years in females. Its age at sexual maturity is 2 years. It is Omnipresent, yet abounds in the Southern Caspian. Propagates in the Volga delta, in coastal waters of Daghestan, and in Azerbaijan. It feeds on mollusks, crustaceans, clam worms, and fishes. It is of commercial significance.

Caspian Salmon (*Salmo trutta caspius*) – subspecies of bulltrout dwelling in the Baltic and White Seas, CS resemble salmon and has long been regarded as its subspecies. It is distinguished by the lower tail-stem. This is Europe's largest salmon: some specimens have weighed up to 51 kg. An anadromous fish, it dwells in the sea, keeping closer to the western and southern shores, and propagates in the rivers. CS prefers spawning in rivers and specifically returning to where they were born, never

making a mistake. For spawning, CS enters the rivers of the western shore, such as the Kura, Terek, Samur. It hardly ever enters the Volga or Ural. There still exist records saying that in the seventeenth century CS used to be fished on a commercial scale near Kazan, and it used to enter the Kama, White and Oka rivers. The fish's good taste led to excessive catches; this overfishing, coupled with the changing flow of the Volga, is the reason for the total disappearance of the Volga population. A spawning population of the species remains in the Kura river. CS is reared at some fish farms.

The body is thick, the snout pointed. The body coloring has a variety of shades: from light on the sides to dark-green and green-blue on the back. Black spots of cross-like or irregular shape are scattered over the body sides. Its length 73–133 cm and it has a lifetime of 10 years. It is rarely encountered in the Northern Caspian or near the eastern shores, and it never goes to high seas outside the 40–50-m isobathe, yet it migrates over rather long distances.

It is a very fat fish, with a fat content reaching 21.4%, dropping to 3.4% after propagation drops. CS population was never too high. Significance of CS as an object of fishing is determined by its taste only. CS has spring and winter forms. A spring-form specimen enters the Kura in October with almost mature reproductive organs, runs up the river not too far, and spawns the same year. This is a relatively small salmon (under 12 kg). A large winter form spawns in November through February (most often in January). Its reproductive organs are immature and its weight averages below 15 kg when it runs up to the source of the Aragvi. Now that the flow of the Aragvi River is regulated, the fish spawns in the Alazania and Khram river basin. The winter salmons stay in the river for 8–11 months to mature. Young fish dwell in the river for up to 2 years. Similar seasonal forms are discovered in salmons that enter the Samur and Terek, too. CS occurs in the rivers of the provinces Gilan and Mazandaran, Iran.

Caspian Scientific Research Station – located on Artyom (Pirallahi) Island. Established in 1948 by Prof. B.A. Apollov, it belonged to the Institute of Oceanology of the USSR Academy of Sciences. In 1951–1952, it was transferred to the Sector of Caspian Sea problems (SCSP) of the Institute of Geography of Academy of Sciences of the Azerbaijan SSR. It was situated in the old settlement on Artyom Island on the Caspian seashore 70 km from Baku. The station had small ships, a wave-generating basin, and a trough for modeling marine dynamic processes. After CSRS was transferred to SCSP, all experimental work was, at the initiative of Prof. K.K. Gul, transferred to the preserved sea oil platform situated in Andrievskogo shoalbank 20 miles northeast of Artyom Island in open sea. The platform had an active and unique research station with permanent personnel. Research was carried out by both Soviet scientists and foreign experts (from Japan and DDR). The station studied the processes of turbulence and diffusion at sea in natural conditions, the exchange between the sea and atmosphere, and the spread of pollutants in marine environments. Concurrent with this, marine expeditionary research was performed on board the ships “Truzhenik” (“Toiler”) and “Mir-Kasimov” and later at the Scientific-Research Station “Bakuvi.” In 1975, SCSP was dissolved and the

research Center “Caspii” was established in its place. In 1980, the work on the platform in Andrievskogo shoalbank was terminated and the shore station on Artyom Island was closed.

Caspian Sea (Pers. – Darya-ye-Khazar; Azer. – Khezer Denizi, Turkm. – Kaspi Denzi, Kazakh. – Kaspi Tenizi) – world’s largest landlocked water body situated deep inside the Eurasian continent. The sea occupies an extensive depression in the earth’s crust, and the current sea level is 27 m below ocean level. Its area is over 370 thou km², with a water volume of around 78 thou km³, a mean depth of 208 m and a maximum depth of 1,025 m. From the north to the south the sea extends 1,030 km, and its width varies from 200 to 400 km. Its ample size and long latitudinal extension determines its diverse natural conditions.

Since 1991, The Caspian coast borders 5 states (Russia, Iran, Azerbaijan, Turkmenistan, Kazakhstan), while its basin includes states (Georgia, Armenia, and Turkey in addition to the 5 aforesaid states).

Physiographically and by nature of its bottom topography, the sea is divided into three parts: Northern, Middle, and Southern Caspian. The shallow northern part (15–20 m) of the sea sits entirely on the shelf. It is separated from Derbent Basin of the Middle Caspian whose maximum depth is 788 m. The subsea Apsheron Sill, with overlying depths of 160–180 m, separates Derbent Basin from the South Caspian, which is the deepest part of the sea. The conventional boundary between the Northern and Middle Caspian is the line between Chechen Island (Daghestan) and Tyub-Karagan (Kazakhstan), and the boundary between the Middle and Southern Caspian is the line between Zhiloi Island (Apsheron Archipelago, Azerbaijan) and the Kuuli Cape (Turkmenistan). The water volume in these parts of the sea equals 0.5; 33.9, and 65.6%, respectively.

In the north, the sea is joined by the Circum-Caspian Lowland. From Agrakhansky Peninsula in the west to Buzachi Peninsula in the east, the shores are low-lying, semi-desert. It is only in the enormous (up to 15 thou km²) Volga delta that development is intense. On the western seashore, almost as far as the Apsheron Peninsula, the foothills of the Greater Caucasus stretch, while farther to the south lie the Kura-Araks Lowland, the Kura Delta, and the Lenkoran Lowland that separate the Talysh Mountains from the sea. The narrow coastal lowland hems the southern Caspian shore. Along this lowland stretches the Elburz Range. The entire eastern shore is a desert: The Ustyurt Plateau is between the Mangyshlak Peninsula and Kara-Bogaz-Gol Bay and overlooks the sea. The eastern shore of the Southern Caspian is low-lying, and the sands of the West Karakums come close to the sea.

Several large bays jut into the seashores, including on the eastern shore: Mangyshlak, Kazakh, Kara-Bogaz-Gol, Turkmen, and Krasnovodsk (Turkmenbashi) Bays; and on the western seashore: Agrakhan and Kyzylagach Bays.

Islands in the Caspian are small (total area around 2 thou km²) and are located near the shores. In the Northern Caspian are Chechen, Tyulenii, and Kulaly Islands as well as a great many islets in the Volga delta. To the east of the Apsheron are

the islands of Apsheron Archipelago, and to the south of Baku Bay is the Baku Archipelago, where most of the islands and shoalbanks are of volcanic origin. The narrow, sandy Ogurchinsky Island is near the eastern shore of the Southern Caspian.

The shelf, continental slope, and bed of abyssal cavities can be clearly distinguished in the seabed relief. The whole of the Northern Caspian is within the shelf. In the Middle and Southern Caspian, the shelf along the western shore is narrow, while the one along the eastern shore is wider and largely confined to depths fewer than 100 m. The continental slope beyond the shelf edge descends to depths of 500–600 m in the middle and 700–750 m in the southern parts of the sea. The deepest segments of the seabed, which shift toward the western shore, constitute the beds of the abyssal cavities of the Middle and Southern Caspian. In the southern part of the sea, submerged ridges and active mud volcanoes are found.

More than 130 rivers flow into the CS, and their total mean long-term runoff is around 300 km³/annum. The Volga accounts for the greater part of this amount (240 km³/annum). Together, the Ural (8 km³/annum) and Volga runoffs into the Northern Caspian account for 85% of the total runoff into the sea. Around 10% of the runoff is from rivers of the western shore: the Terek, Sulak, Samur, and Kura, and approximately 5% is supplied by small rivers of the southern seashore. The eastern seashore is totally devoid of fresh runoff.

Due to its considerable latitudinal extent, the sea is within several climate zones. The northern part is in the zone of temperate continental climate, the western shore is in temperate, warm climate, and the southwestern and southern shores are in a subtropical climate. The eastern shore is in a typically desert climate zone.

In winter, the weather of the Northern and Middle Caspian is determined by continental polar air associated with the impact of the Siberian anticyclone and by arctic air spreading from the Kara and Barents Seas. In the Southern Caspian southern cyclones are often observed. The weather is unstable and rainy in the west and dry in the east. In summer, the sea is influenced by the Azores maximum wedges, the strongest being in the west and northwest. In the southeastern part of the sea, the influence of the extensive Iran-Afghan minimum can be felt. At this time, stable and dry weather stays over the Caspian.

For most of the year, the prevalent winds over the seas are northerly (40%, nearly half of which are northwesterly) and southerly (36%, more often in winter). The mean wind velocity over the water area is 5.7 m/s, while in the middle part of the sea it increases to 6–7 m/s, and around the Apsheron Peninsula to 8–9 m/s. The dominant northwesterly winds in stormy weather reach speeds of 20–25 m/s here (the “Baku nords”).

The air temperature in winter (January–February) averages -10°C in the northeastern part of the sea (in most severe winters it reaches -30°C) and $8-12^{\circ}\text{C}$ in the south. In summer (July–August), the mean monthly air temperature across the sea is $24-26^{\circ}\text{C}$, while the maximum temperature on the eastern shore exceeds 40°C .

Atmospheric precipitation in different parts of the sea does not fall uniformly, ranging from 100 mm/annum on the arid eastern seashore to 1,700 mm/annum in the southwest (Lenkoran). On the open sea, precipitation averages 200 mm/annum.

The water balance (budget) is mainly determined by the river runoff, atmospheric precipitation (input), evaporation, and runoff into the Kara-Bogaz-Gol (output). The decisive factor concerning inputs is the river runoff, nearly 80% of which is provided by the Volga. The water input into the Caspian is almost 100% balanced by evaporation. The difference between the input and output components (the balance resultant) is reflected in the total volume of water in the sea and in the sea level variability. The mean long-term annual values of the Caspian water balance components for the period of 1900–1990 were as follows (km^3/cm of water layer): river runoff 300/77, atmospheric precipitation 77/20, groundwater discharge 4/1, evaporation 377/97, runoff into Kara-Bogaz-Gol 13/3.

Water balance variations determine the considerable year to year fluctuations of the sea level, which is particularly tangible in the shallow Northern Caspian.

According to historical information and paleo-geographical data, the value of Caspian level fluctuations from the first century B.C.E. until the present time has been no less than 7 m. From the early twentieth century to 1977, the sea level fell by 3 m. This was followed by a rapid rise, and by 1996 the sea level reached elevations close to -27 m. At present, it has been established reliably that the Caspian level fluctuations are determined by climatic factors, whereas geological and tectonic causes are immaterial at present. Long-term fluctuations of the Caspian level is a logical phenomenon reflecting the “breathing” of the water body, therefore the value of these (1–1.5 m over several decades) should be taken into account.

The seasonal march of the sea level depends on the distribution of river waters (mostly of the Volga) coming into the sea during a year. Therefore, the minimum height of the sea level is observed in winter. The most violent storms are generated in open water areas of the Middle Caspian, around Makhachkala, Apsheron, and the Mangyshlak Peninsulas. The mean wave heights of maximum recurrence on high seas are 1.5 m, while in the Apsheron area they are less than 2 m; maximum wave heights around the Neftyanje Kamni Shoalbank are just under 8–10 m during extremely rare violent storms.

Water circulation is produced by wind, especially in the upper layers, and the non-uniform density field within the water mass. The outlines of the seashores and seabed relief have a substantial impact on the currents. In the shallow Northern Caspian, weak, unstable currents are observed, which are produced by wind and river runoff. A fair portion of desalinated Volga waters is transferred to the south along the Middle Caspian western shore. In the deep-water sea basin, the circulation is of rather complex vortical nature. A system of 2 circulations is distinguished in the Middle Caspian: cyclonic in the northwestern part and anticyclonic in the southeastern part. There is also a “vortical dipole” observed in the Southern Caspian, but of a reverse character: an anticyclone in the northwest and a cyclone in the southeast. Depending on the season, the positions, velocities, and sizes of these circulation formations vary. Vertically, these may be distinguished within the layer of up to 100 m. The mean velocities of the circulations are 5–20 cm/s. Strong northerly and southerly winds are capable of inducing a transient acceleration of the currents to 50–60 cm/s.

The temperature of the water on the surface in winter (January–February) rises from 0–0.5°C in the north to 10–11°C in the south. The Northern Caspian is frozen from November until March. Fast ice and floating ice are formed here, even though the ice cover is unstable. The southern boundary of median ice spread passes over the slope in the form of a convex northward arch from Chechen Island to the Tyb-Karagan Peninsula. Depending on the severity of the winter, the time of ice formation and melting as well as ice surface area change substantially. The mean ice thickness ranges from 30 to 60 cm, yet hummocks as thick as 1.5 m are encountered.

During the summer, the water temperature throughout the sea grows uniform and in most of the water area equals 23–28°C; however, a negative water temperature anomaly (under 12–17°C) is taking shape in July–August on the eastern shelf of the Middle Caspian in a zone of seasonal coastal upwelling.

Vertical distribution of water temperature in winter is uniform thanks to intensive processes of density (convective) mixing. In summer, thermocline is located at 20–30 m depth, separating the upper heated layer from the rest of the water mass that is at a lower temperature. In autumn, as cooling commences, the thermocline is destroyed. In the near-to-bottom layer of the abyssal sea basins the temperature in the Middle Caspian equals 4.5–5.5°C, in the Southern Caspian it equals –5.8–6.5°C.

The abundant river flow into the enclosed CS results in its low salinity (12.8–12.9‰), which is almost 3 times as low as the mean salinity of the World Ocean (35‰). Salinity is most variable in the Northern Caspian, where it increases from 0.1 to 0.2‰ near the Volga and Ural deltas to 10–12‰ at the boundary with the Middle Caspian. At the same time, maximum horizontal gradients of salinity are observed in the frontal zone between the river and sea waters. In the Middle and Southern Caspian, the differences in salinity are low, and its values stay within 12.5–13.4‰, increasing from the northwest to the southeast. Salinity distribution in the water body is rather homogeneous, too: from the surface to the seabed it only increases by 0.1–0.3‰. Thanks to the homogeneous salinity, the entire water body of the CS is mixed well. In winter, vertical circulation in the Middle Caspian reaches a depth of 150–200 m, while in the Southern Caspian it is 80–100 m. During severe winters it is much lower. The deepest sea layers are ventilated thanks to the submersion of cold waters that form in the northern and eastern shelf areas. The content of oxygen in the upper layers in winter is 7–10 ml/l, while in summer it is 5–6 ml/l. In the near-bottom layers, it equals 2–3.5 ml/l in the middle part of the sea and 1.5–2.5 ml/l in its southern part.

Due to the high input of the suspended river load, the transparency of Caspian waters is low, especially in the estuarine segments of the rivers and in shallow-water zones (under 0.2 m). In the open parts of the sea, water transparency reaches 15–17 m. The Caspian waters are characterized by a relatively low content of sodium and chloride salts, but contain large amounts of magnesium carbonate and calcium as well as sulfates, which is due to the long history of insularity from the ocean and specificity of water alimentation.

More than 100 fish species live in the CS and its river deltas. The Caspian fauna proper include herrings, kilkas, gobies, and sturgeons; the fresh-water fauna

are carps and perches. Arctic species are salmon and inconnu. The following fish are distinguished in the Caspian ichthyofauna by lifestyle: anadromous, semi-anadromous, and sea fish. Anadromous fishes dwell in the sea and enter the rivers for propagation. These include sturgeons (except starlet), some herrings, salmon, and roach. Semi-anadromous fish keep to freshened parts of the sea, but for propagation also run up the rivers. These are starlet, sander, bream, and herrings. Among the fish that spend most of their lives in the sea, the commercial fish are sea perch (bersh), kilkas, and some herrings. Until recently, the sea provided up to 80% of the world yield of sturgeons, which comprise 5 species: sturgeon, beluga, stellate sturgeon, barbell sturgeon, and starlet. The bulk of the yield of valuable fish species, including sturgeons, is in the Northern Caspian. At present, the environmental situation in the Caspian Sea has declined considerably, which has had an adverse impact on its inhabitants: fish, birds, and seals.

The major Caspian ports are: in Turkmenistan – Turkmenbashi (formerly Krasnovodsk); in Russia – Astrakhan, Olya, and Makhachkala; in Kazakhstan – Aktau and Atyrau; in Azerbaijan – Baku; in Iran – Nowshahr, Bandar-Anzali, and Bandar-Torkaman.

The Caspian Region has a wealth of natural resources with substantial reserves of hydrocarbons (oil and gas), minerals, biologicals, agroclimatics, balneologicals, and recreational components. The Caspian shore has always been one of Eurasia's main areas of mass habitation of waterfowl and semi-aquatic birds. Five to six million waterfowl specimens, dwelling in many countries of Europe and Asia, migrate via the Caspian Region. Pursuant to the Ramsar Convention, 4 areas of the Caspian coast: the Volga delta, Kyzylagach, Turkmenbashi, and North-Cheleken Bays are recognized as wetlands of international significance. The Caspian with its delta river areas features a unique composition of plant species. Biological resources of the Caspian Sea are invaluable. They include 1,809 species and subspecies of animals, out of which are 1,069 free-living invertebrates, 325 parasitic species, and 415 vertebrates.

The CS and its surrounding areas are in a zone of increased seismic activity. One major event was the catastrophic Krasnovodsk earthquake of 1895 (magnitude – 8.2 on Richter scale, 11–12 points on the 12-point scale). Additionally, mud volcano eruptions often occur on the Caspian, mostly in the southern part of the sea. There are many such volcanoes on the seashore here and on the numerous islands and shoalbanks. The activity of mud volcanoes is the cause for new shoalbanks and islands emerging, though most of these are scoured subsequently. Some of these shoalbanks and small islands have emerged on the surface of the seas several times. The most mud volcanoes are found around the Baku Archipelago, where most of the shoalbanks and islands are of volcanic origin. There are mud volcanoes far away from the shores, too. These include the shoalbanks Gryazny Vulkan, Ulskogo, and Livanova.

Implementing a package of measures toward preventing further pollution of the aquatic environment and developing an effective nature-conservation strategy are currently the crucial problems of the CS.

Satellite image of the Caspian Sea (24 August 2005, MODIS-Aqua)



“Caspian Sea” – unified name of a series of monographs that were published from 1985 by the USSR Academy of Sciences, USSR State Committee for Science and Technology, the Water Problems Institute of the USSR Academy of Sciences. Since the publication got under way, the following monographs were released” **“Fauna and Biological Productivity”** (1985), **“Hydrology and Hydrochemistry”** (1986), **“Geology and Oil-and-Gas Presence”** (1987), **“Ichthyofaunas and Fishery Resources”** (1989), **“Problems of Sedimentogenesis”** (1989), **“Structure and Dynamics of the Waters”** (1990), **“Problems of Geology and Geomorphology”** (1990), **“Paleography and Geomorphology of the Caspian Sea in Pleistocene”** (1991), **“Hydrology of River Mouths: the Terek and Sulak”** (1993).

Caspian Sea – Aral Sea – Canal, (Casparal Project) – design of Caspian Sea level regulation and simultaneous replenishment of the Aral Sea with a view to stabilizing and restoring its level. The design proposal was made in 1987. The water is to be

abstracted from the Northern Caspian (Komsomolets Bay) and shall be supplied to the Aral Sea over a 540-km long canal passing along the northern border escarp of Ustyurt Plateau with the initial discharge of 1,700 m³/s. Up to 40 km³ water is to be pumped each year, which will make it possible to harness the Caspian level by 10–12 cm. The complex of structures originally included the construction of a thermal (nuclear) power plant to provide for the operation of 3 pumping stations required for raising the Caspian waters to the Aral Sea (122 m).

“Caspian Sea Bulletin” – digest of scientific information on problems of the oil-and-gas complex development, geopolitics, ecology, transport, analytic research, and regional and international cooperation of the countries of the Caspian Region. Published in Moscow since 1996. Founded by I.S. Zonn, Doctor of Geography, Academician of the Russian Academy of Natural Sciences. Published six times a year.

Caspian Sea Coasts – the length of the Caspian Sea coastline at the average water level 26.5 m below ocean level is 6,840 km and, in addition to the coastlines of islands (740 km), is 7,580 km. The coasts have very diverse natural conditions. The northern coasts are covered by scanty vegetation – largely shrubs and steppe grasses. The river deltas are overgrown with reed thickets. Forests are found only in some places of the southwestern coast and inside the Volga delta.

The coasts of the middle part of the Caspian Sea differ greatly. The western shore between the cities of Makhachkala and Baku is covered by the high Caucasus Mountains that in some places (near the cities of Derbent and Makhachkala and to the north of the Cape Kilyazinskaya Kosa) come very close to the coastline. In other places, they recede from the shore by 10–40 km. On this shore, the largest mountains are Bayanata, Djalgan, Tarki-Tau, and especially Besh-Barmak. The mountain slopes on the northern shore are overgrown with forests and shrubs, while moving southward the vegetation cover on the slopes loses its diversity. A narrow coastal strip between the eastern slopes of the Caucasus and the sea shore is occupied by a plain cut by numerous rivers, the biggest of which is the Samur River. Between Makhachkala and Derbent the plain is used for agricultural purposes.

On the Apsheron Peninsula, vegetation is found mainly on its northern and northeastern shores where there are many orchards and vines. The mountains that stretch over the peninsula are devoid of vegetation.

The appearance of the southern coast of the sea is most diverse. From Baku to the Alyat Cape along the western coast of the sea, the southeastern spurs of the Caucasus extend, among which the Baku Ushi Mountain are the highest and most remarkable. Further to the south, the mountains gradually go away from the coast to the west, giving place to the wide Kura-Araks Lowland. This lowland is covered by agricultural fields. The Kura River delta is overgrown with cane. Near the city of Lenkoran, the mountains again come close to the shore, forming the Talysh Mountain chain. The southern extension of the Talysh Mountains is the Bogrovdag ridge.

The southern coast of the Caspian Sea is fringed by the Elburz ridge. These mountains extend parallel to the shore, approaching the coastline in some areas from 2 to 5 km and going away from it by 30–50 km in other areas, where they give place to coastal lowlands. The average height of the mountains in the Elburz ridge is about 2,000 m. The highest of them is the conical snow-capped mountain Damavand, which top reaches 5,632 (5,604) m. Many rivers run down from the Iranian coast, the largest being Sefid Rud, Babol, and Gorgan. The southern coast of the sea is very picturesque. The coastal zone and mountain slopes from the cities of Lenkoran to Bandar-Torkaman are covered with forests, shrubs, fruit trees, tea plantations, and rice fields. The warm and humid subtropical climate here is conducive to the great diversity of tree species of which the most valuable are oak, boxwood, ironwood, and others. Of great value are also citrus trees, as well as pomegranate, persimmon, bamboo, rice, cotton, tobacco, and kenaf. The forests on the Elburz northern slopes in some places are like subtropical jungles. Many marshlands are found here.

The eastern coast of the southern part of the sea is covered with sandy deserts with isolated dunes and hummocks rising here and there, while in some places highlands are found. The height of sandy hummocks increases in the direction from the south to the north. The hummocks and dunes on this coast are rather monotonous. Due to the wind action, the hummocks and dunes drift, thus their appearance is constantly changing. The whole eastern coast of the southern part of the sea is practically devoid of vegetation.

The eastern coast of the middle part of the sea is mostly elevated, but its height is much less than that of the western shore. The Ustyurt Plateau extends between the Tyub-Karagan Cape and Kara-Bogaz-Gol Bay. It approaches most closely the sea shore in the northern part of the eastern coast; in the southern part only some sandy dunes are scattered. In some places, the coast plunges abruptly into the sea. To the south of the Kara-Bogaz-Gol Bay, low spurs of the Kubadag mountain range come to the sea. The eastern coast of the middle part of the sea practically has no vegetation.

The coastline of the Caspian Sea is subject to significant transformations as a result of periodical fluctuations of the sea level. Most affected is the coastline in the shallow and meandering northern part of the sea. Between the Makhachkala port and the Volga mouth, the Astrakhan and Kizlyar bays cut into the western coast of the sea. Near the eastern coast between Buzachi and Tyub-Karagan is the large Mangyshlak Bay; some shallow harbors, kultuks, and ilmens are found here, too. The shores of the Volga delta northward of the Buzachi Peninsula are so heavily cut and overgrown with reeds that in some places it is hardly possible to track the coastline.

In the middle part of the Caspian Sea, the eastern coast is most rugged. Here such large bays as Kazakhsky, Kara-Bogaz-Gol, Turkmenbashi, and Turkmeny are found. The western coast here as far as the Apsheron Peninsula is not so deeply cut, while the shores of the Apsheron Peninsula form several noticeable capes, the largest of which are the Amburansky and Kilyazinskaya Kosa.

The coastline in the Southern Caspian, except for the Iranian part, is incised still more than the middle part. In the south of the Apsheron Peninsula is the large Baku Harbor that is well protected from northern winds. The Kyzylagachsky Bay is found to the south of the Kura River mouth, and is separated from the sea by the Kura Spit. As far as capes, the largest here is the Sefid Rud.

In terms of diversity, the Caspian coasts are represented by three main forms: abrupt, abrupt-flat, and flat. These forms are closely connected with their geological structure. The coast forms are changing, affected by sea waves, winds, and currents causing sediment drift, and atmospheric precipitation and live organisms.

Caspian Sea Currents – the major factors that shape the currents of the Caspian Sea are the impacts of the wind, especially in the upper layers, and the non-uniform density fields in the water column. The topography of the seashore and seabed also exerts a substantial impact on the nature of the currents. Field studies of the Caspian currents are focused on the coastal area with depths largely under 50 m. Therefore, the special features of water circulation in deep-water areas are characterized by the results of hydrodynamic modelling.

In the shallow Northern Caspian, C. are determined by the wind as well as the abundant runoff coming from the Volga and are unstable. The prevalent water transfer occurs along the marine delta bar of the Volga in the direction of southwest and northeast, the mean velocities of the currents being 10–20 cm/s. The considerable desalinated Northern Caspian waters are transferred along the western sea shore as far as Apsheron Peninsula. This steady southeastern current persists despite the adverse southerly winds.

Synthesis of instrumental observations of the currents in the offshore zone of the Middle and Southern Caspian indicate that these currents are associated with regional winds over the vast expanses of the seas. This link increases with the growing wind force. During stormy winds 70% of currents flow downwind. The secondary effect of protracted and strong winds is manifest in the gradient currents directed against the wind. With the winds blowing at 5–10 m/s, which are more often than not observed over the Caspian water area, the mean velocities of the currents in the surface layer equal 20–30 cm/s. and with stronger winds they tend to increase to 50–60 cm/s (hardly ever higher). In calm and of slight winds, slow currents are dominant; these may be multidirectional and connected with previous winds and the inclination of the sea-level surface. According to long-term field studies, on the western shelf of the sea throughout the water column there dominate southerly directed currents except in the Kura River delta area, where the currents are largely directed northward. C. along the eastern sea shore are less stable. During the warm period of the year, southerly C. prevail in the surface layer, while during the cold period northerly C. are most common. In the near-bottom layer, water transfers are observed all year round.

The results of numerical simulations show that in deep-water Caspian basins, water circulation is distinctly complex and features substantial seasonal variability. Overall water circulation, however, has been established as being of a medium scale

vortical nature. In the Middle Caspian, the system of cyclonic gyre in its northwestern part and of anticyclonic one in the southeastern part is observed. In the Southern Caspian, too, a vortical dipole exists but of the opposite nature: here, the anticyclone is in the north-west of the basin, and the cyclone is in the southeast. Seasonal dynamics of these circulation systems consists of the interrelated variations in the position, size, and intensity of the gyres. Vertically, these may be traced down to 100 m depth. Mean velocities of *C.* in the centers of the gyres are 5–10 cm/s, while at the junctions of the gyres of opposite signs they are up to 20 cm/s.

Although appreciating the nature of the circulation in deeper layers of the sea requires further research, studying the circulation is a top priority because of the circulations' crucial role in forming the hydrological pattern of the sea as well as by the need for more detailed data on *C.* for practical purposes.

Caspian Sea Department – established at the Institute of Oceanology of the USSR Academy of Sciences. On more than one occasion, in association with the Academy of Sciences of Azerbaijan SSR and Azerbaijan State University, it held conferences on the Caspian: in Baku in 1951, 1953, and 1963; in Moscow in 1954 and 1960; and in Astrakhan in 1956.

Caspian Sea Level – the Caspian Sea being a landlocked water body is subject to considerable long-term level fluctuations that significantly affect the natural conditions of the water body proper and the economic activities in the coastal zone. Study of the Caspian level regime is one of the key issues. Among the basic factors causing long-term fluctuations of the Caspian sea level are geological processes (a changing capacity of the marine depression due to tectonic dislocations) and climatic changes (changes in the sea water budget), but their contribution to the level dynamics are not identical. Tectonic dislocations were the key factors at the initial stages of the Caspian depression formation, but already in the Holocene (no less than 10 thousand years ago) large-scale fluctuations of the Caspian Sea level were induced by the climatic conditions in the sea basin and in its water area. Historical, cartographic, and paleographic investigations have proven that deep transgressions and regressions of the sea accompanied by changes of its area could not be the result of weak tectonic dislocations fixed in those times, but had water-climatic origins. Frequent changes of the directions of tectonic dislocations in the Caspian Sea depression, their insignificance (several mm a year, i.e. 1–2 orders less than the real fluctuations of the sea level) have prevented adoption of the “tectonic” theory as the cause of C.S.L. variations in the modern geological epoch.

In the recent 2000 years, C.S.L. fluctuations reached 7 m. The minimum level was registered in the sixth to seventh centuries. Later on it varied within narrower ranges: from –30 to –25 m abs. (sea levels are presented in the Baltic System). Results of instrumental observations over the sea level initiated in 1830 have shown that from the early twentieth century up until 1929, C.S.L. was close to elevation –26.2 m abs., but after this it began to drop drastically and by 1956 its level was nearly 2 m lower. This was associated with severe draught in the Volga basin that

caused significant reduction of its flow. In the 1950s, the water availability of the basin increased, but in those years, major reservoirs were constructed on the Volga and considerable volumes of water were required to fill them. In addition, water consumption for economic needs have grown, too. Thus, between 1950 and 1960 C.S.L. did not rise, but became somewhat stabilized. In the 1970 s, a new water level drop was witnessed, caused by reduction of the Volga flow and increased evaporation. In 1977 the level dropped to -29.0 m abs., the lowest in the recent 400–500 years. The total drop of C.S.L. in the twentieth century was 3 m, out of which 1.5 m was due to anthropogenic withdrawals of the river flow. The water level drop led to shrinking of the water area by approximately 40 thou km², mostly due to desiccation of the shallow Northern Caspian.

Beginning in 1978, the water level started its quick rise, and in 1995, it reached -26.7 m abs. This process was also due to a changed water budget, the increment of which was about 50 km³ a year, which correlates rather well with the level rise in the same period. The resultant positive balance was largely due to the large Volga flow whose connection with C.S.L. was reliably proved. By 2000, C.S.L. again dropped to -27.0 m abs.

The forecasts of the level fluctuations in the future are of great scientific and practical interest, but this problem is very complicated because it requires elaboration of climatic forecasts for a vast region covering the whole watershed basin of the Caspian. Therefore, at present we can make only probabilistic estimations of the Caspian level fluctuation for the next decades based on paleogeographical analysis to compare the long-term data on the water budget. These estimates show that in the nearest future it is quite unlikely that C.S.L. will exceed elevations of -26 m abs. Under present physiographical conditions, the mean C.S.L. should fluctuate around -27 ± 1 m abs. elev. The likelihood of such level fluctuations should be taken into consideration in planning economic activities along the coastal zone.

The seasonal dynamics of the water level is also dependent on the river flow into the sea, mostly of the Volga. As a result, the minimum water levels are observed in winter, while the maximum are observed in summer. The seasonal water level fluctuations are equal to about 30 cm.

“Caspian Sea Lights, Signs, and Radio Aids” – manual containing navigation information published during the Soviet period by the Hydrographic Department of the USSR Ministry of Defense.

Caspian Sea Mapping – information on the Caspian Sea quoted in the works of geographers and writers of antiquity is rather scarce and contradictory. Homer (seventh century B.C.E.) says that the Manych River was a strait that could be used for travel from the Black Sea to the Caspian Sea. The Greek Hekatei of Miletus (circa 546–480 B.C.E.), in his map showing the earth east of the Pontos Euxeinos (Black Sea), depicted the Caucasus Mountains, and farther to the east, the Caspian Sea. It should be noted that in literature on history of geography different points of view are

voiced regarding the matter of land outline as Hekatei viewed it. Some, in particular A. Humboldt, are of the opinion that the ocean, surrounding the land, penetrates its interior, except the Mediterranean Sea, in the form of three other bays of which one is in the east – Hircanian (Caspian Sea). Others note that the Caspian Sea to Hekatei was an enclosed sea. Herodotus (circa 484–425 B.C.E.), just like Hekatei, regards the Hircanian Sea (Caspian) as an enclosed water body and deduces the ratio of its width to its length at 1:6, which is rather close to reality. The latter agrees well with geographical ideas of Eshil who, in his Prometheus tragedies, refers to the Caspian Sea as an enclosed water body.

Aristotle (384–322 B.C.E.) shows on a map that the Amu-Darya and the Syr-Darya flow into the Caspian Sea which he, like his predecessors, regarded as an enclosed basin.

In 323 B.C.E., the Commander Seleuk I Demetrius repeated the route of Alexander the Great from the Oxus River (Amu-Darya) to the Yaksart River (Syr-Darya). Between 285 and 282 B.C.E. another commander of Seleuk, Patroclus, made a voyage on the Caspian Sea. Patroclus reached Kara-Bogaz-Gol Bay and mistook it for the estuary of a river linking the Caspian with the ocean (i.e. proved that the sea was . . . a bay of the North Ocean). Additionally, he confirmed the guess that the Oxus and the Yaksart flowed into the sea. The latter hypotheses were alive throughout the entire period of antiquity. According to Strabo, Patroclus voiced the idea about the possibility of sailing from the Caspian Sea around the northeastern shores of Asia to India. But, for some reason, this utterance of Patroclus was associated with his stay in India and gave rise to the legend (quoted by Pliny) whereby Patroclus, allegedly, made that voyage himself.

The Alexandrian scholar Eratosthenes (circa 276–195 B.C.E.), concurring with Patroclus, indicated the Caspian Sea in his map, depicting it in the form of a bay of the Arctic Sea. Later, Posidonius referred to as “the best educated traveler of the ancient times,” like Eratosthenes regarded the Caspian Sea as a bay of the Arctic Ocean.

The famous geographer of antiquity Strabo (circa 63 B.C.E.) in his book “Geography” drew the Caspian Sea stretching along the parallel from the west to the east. In his map, the Kura and Araks rivers flow into the Caspian Sea separately. The Amu-Darya, too, flows into the Caspian Sea. Strabo thought that the Caspian Sea was a bay of the Arctic Ocean with which it was linked by the Volga. In the map of Pliny the Elder (23–79), the Caspian Sea is depicted as a bay of the World Ocean. Claudius Ptolemaeus (second century) was of the opinion that the Caspian Sea was an enclosed one, maintaining that it had no connection to other seas, yet he drew the Caspian Sea as a circle. In Ptolemaeus’s map, the Oxus River (old channel of the Uzboi) flows into the Caspian Sea. The map has no indication of the islands or bays. The Encyclopedia written by this geographer contains the description of the nature of the Caspian Sea, with an indication of the islands, where the locals feed on birds’ eggs and cereals, telling the reader about the “Caspian Sea mouth” that goes dry “during low tide” (i.e. at the time of negative surge, which applies to the Volga mouth).

The Arab geographers and writers used to depict the Caspian Sea as round or oblong. In the tenth century, the Arab traveler and geographer Istahri (951–1000), in “Book on the Routes of the State,” wrote about the Caspian Sea (he called it Bahru-Hazar) in the form of a circle; he also said that there are two islands in the middle of the sea, Chechen and Kulaly and from the north the Volga flows into the sea. Muhammad al-Idrisi (1099–1165) describes the Caspian Sea as oblong or close to circular in shape, with 4 islands. Mohammad al-Sharfi (1601), making use of Idrisi’s works, draws the Caspian Sea in his map, calling it Bahru-Hazar.

The West European scholars in the Middle Ages and even during the Renaissance had rather scarce ideas of the Caspian Sea. The maps of Marino Sanuto (1320), the brothers Pizzigani (1367), and Catalonian (1375) based on the voyages of Genoa seafarers provide a picture of the Caspian Sea and adjoining areas rather distant from reality. Fra-Mauro’s map (1459) was an exception at that time as it presented relatively plausibly both the general outline of the Caspian Sea and its specific areas.

A more detailed map of the Caspian Sea was made by the German scholar and traveler Adam Olearius (1636, though according to other sources – 1674), and even though his portrayal of the Caspian Sea is wrong, his map does show Chechen Island.

The Russians knew about the existence of the Caspian Sea as early as at the end of the ninth century; however, the sea was only indicated in the “Big Drawing of Moscow State and of all Adjacent States” in 1661. In 1692, the Dutch geographer Nicolas Witsen who stayed in Moscow in 1664–1665, in his book “The North and East of Tataria” (1692), writes that by order of the Tsar Alexey Mikhailovich “the Caspian Sea as well as the Volga and its mouth were indicated in the map.” Naturally, it was not a geodetic survey of the Caspian that was in question, but, rather, indication of the sea in a West-European map on the basis of “information obtained through interrogation of the merchants.” Such a map was available in Moscow in the mid-seventeenth century. The original of the map has failed to survive, though we do have a copy made by Witsen from 1665. The same Russian map was copied by the Swede E. Palmquist in 1674 and published by Nordenschild in his Atlas of 1879. In 1676, the description of a journey made by the Dutch Ian Streis, an expert sail-maker, was published in Amsterdam; the Dutchman, by order of Alexey Mikhailovich, went down the Volga as far as Astrakhan on board the “Orel” (“Eagle”) ship, entered the Caspian Sea, and was shipwrecked near Derbent. The book had an attachment – a map titled “Chart of the Caspian Sea with the islands and cities, drawn by Ian Streis in 1668” (the translation of the I.I. Streis’s book “Three Voyages” was published in Moscow in 1935). To his work “Caspian Sea Level over Historic Time,” L.S. Berg attached the Russian copy of Streis’s map from 1719.

Another map showing only the northern part of the Caspian Sea south of 40°N was made by Witsen in 1678. The picture here differs greatly from the map of 1665.

In 1704, Witsen's map, substantially amended by Jobrant Ides, was reissued. Here, the Caspian Sea was shown in full. For the first time, Tyulenii Island was indicated (the island could only be viewed when the sea level was low).

Later, in 1697 and 1699, the Russian cartographer Semen Remezov drew maps in which the Caspian Sea was also shown. In his map "The Drawing of the Land of the Entire Waterless and Difficult Stony Steppe" (1697) placed in the "Drawing Book of Siberia," there is a partial picture of the "Khvalyn Sea." This is the first Russian original picture of the Caspian (because the Russian map from which Witsen copied the Caspian Sea image in 1665 was drawn under a strong influence of Olearius). Although the Caspian Sea outline are far from perfect, here we see for the first time that the Amu-Darya "does not flow into the Caspian Sea; it flows in the Sea of Aral." It is also worthy of note that the Sagyz (Saksyz) and Emba (Gem) Rivers do not reach the Caspian Sea, being lost in lake-like floods. In Remezov's map (1699) also placed in the "Drawing Book of Siberia," the picture of the Caspian Sea is similar to the map of 1697.

True hydrographic and cartographic investigations began at the time of Peter I. Striving to lay the route, via the Caspian Sea, to Central Asia and India, Peter I's attention was pinned to Caspian Sea surveys. The first attempt to study and map the Caspian Sea was undertaken by the Dutchman Sheltrup in 1699, but he died. In 1703, the Captain Jeremy Meier submitted a map-description of the Caspian Sea to Peter I.

Peter I was guided by the goal of studying the Caspian Sea closely: to begin with, he wanted to override the areas east of the Caspian Sea, establish himself on the sea, and make the trade routes secure on the east. To attain this, he sent an expedition in 1714 headed by A.Bekovich-Cherkassky, who in 1715 as commander of the squadron made up of 20 brigantines put to sea and, having gone along the northern and eastern shores, described them. This resulted in the first ever more or less correct map of the Caspian Sea (for a long time, the map was thought to be lost, yet in 1952 it was discovered). In 1716, Bekovich went on a second expedition. In the Peter I directions, he wrote: "... make your way along that river and inspect carefully the flow of that river (Amu-Darya) as well as the dam ascertaining the possibility of making an old channel of this water; see if it is possible to lock all other mouths leading to the Aral Sea and estimate the workforce requirements."

Concurrent with this, in 1716–1718, on Peter I's order, hydrographic operations on the Caspian Sea were continued by Lieutenant A.I. Kozhin and Lieutenant Duke V.A. Urusov, who repeated the surveys of the northern and eastern shores. This is how Peter I formulated the purpose of the expedition: "Make a close inspection of the harbors and rivers and what kind of ships are capable of berthing; make sure whale boats can be used for sailing and as a shelter from storm. . . Also, watch for subsea spits and stone and suchlike, and map these accurately. Besides, cruise across the sea in search of any islands or shoals. Indicate in the map the wide stretches of the sea."

The western shore remained undescribed. A special expedition of Lieutenant-Commander K.P. Van-Verden and F.I. Soimonov was outfitted to survey it. The two

men described the western shore as far as the Kura River mouth, and in 1720 continued the operations on the southern shore, tying up this survey with the one carried out earlier by A. Bekovich-Cherkassky. As a result of this work, a paper was produced entitled “Flat Picture of the Caspian Sea from Yarkov Mouth to Astrabad Bay, rising along the meridian in degrees and minutes, and depth-wise in Russian fathoms and feet”; the picture reproduced the Caspian Sea outline fairly accurately. It was cut out from copper and sent by Peter I to Paris Academy of Sciences, where it was re-issued in French. It was later used as the basis for correct depicting of the Caspian Sea in Western European maps.

In 1723, after signing the Petersburg Treaty and annexing a greater part of the Caspian Shore to Russia, F.I. Soimonov again sailed around and described all shores of the sea in 1726. He made the first description of Baku harbor and its first map.

In 1728, I.G. Herber made a map of the Circum-Caspian areas along with their description. The map was published by the Academy of Sciences in 1736, and its description with amendments was made later and titled “Information about the Peoples and Lands to the West of the Caspian Sea between Astrakhan and the Kura River and about Their Condition in 1728,” published by Acad. G.F. Miller in 1760. In 1731, an atlas made up of 8 maps under the title “Description of the Caspian Sea with its General Map and Atlases of Specific Maps” was released.

A British trading company was established on the Caspian Sea in 1740. Its head was Captain Elton, its seafarer was Captain Woodruff, and its historiographer was Jonas Hanway. The company did not exist for long, but during its existence its ships on more than one occasion crossed the Caspian Sea sailing from Russia to Persia and back. The result of these active missions was sailing directions and a map made by Captain Woodruff. The map was called: “Flat Map of the Caspian Sea as Observed by Captain John Elton, inventor of Elton’s Clinometer, and Thomas Woodruff, navigator of the British ship “Russian Empress” plying this sea for 3 years, and is submitted to Jonas Hanway in St. Petersburg in 1745.” Printing of the map was approved by the British Parliament in 1754 at a scale of 2 inches/degree. Hanway’s notes, “An Historical Account of the British Trade over the Caspian Sea,” were published for the first time in 1762.

In 1745, Lieutenant Bezobrazov described the Volga’s main arm and sailed along the shore from Yarkov Mouth to Karagua Bay (Tyub-Karasu) in Dead Kultuk. The log of his description has been preserved, but the map has been lost.

In 1760, at the insistence of the Senate, Admiral A.I. Nagaev (1704–1781) made a general map of the Caspian Sea using the maps of Soimonov, Woodruff, and various other geographical maps.

In 1762, the navigator I. Panin made a survey of the southern seashore. In 1764–1765, the eastern Caspian seashore was once again surveyed by the former Astrakhan Port Captain I.V. Tokmachev in association with the navigators I. Panin and Matveev. Based on the descriptions of Tokmachev and Panin, a general map of the Caspian Sea was made by Lieutenant Commander Nagatkin (1764) and presented to the Empress Catherine II.

In 1796, another general map of the Caspian Sea made by Admiral Nagaev was released after he had completed a description of the Caspian shores between 1730 and 1734.

In 1781, an expedition led by M.I. Voinovich was sent to the Caspian Sea. The expedition was essentially of a political and economic nature even though it was commissioned to describe locations and make observations “to increase practical knowledge of the Caspian Sea.” The expedition provided a good description of Astrabad and Krasnovodsk bays, Dervish, and Cheleken Islands. The findings of the expedition were used in making the map by A.I. Nagaev and L.I. Golenishchev-Kutuzov.

By early in the nineteenth century, all aforesaid maps were outdated. Due to the variability of the Caspian Sea level, partial surveys were unable to adjust the existing maps. Therefore, in 1807, a map of the Caspian Sea made by Kutuzov was published. In 1826, a new Atlas of the Caspian Sea made on the basis of surveys done by A.E. Kolodkin in 1813–1817 was released. The Atlas included 17 maps.

The study of the eastern Caspian seashore, where observations had been minimal, was continued in 1819–1821 by the expedition led by N.N. Muravyov that introduced corrections and amended this part of the Caspian map.

From 1832 to 1836, the expedition led by G.S. Karelin, while addressing the study of physiography of the eastern shore, made a number of surveys on the strength of which 10 maps were traced. G.S. Karelin was the first to enter Kara-Bogaz-Gol Bay and map it.

From the second half of the nineteenth century, interest toward comprehensive study of the Caspian Sea has increased substantially because the development of mail and passenger steamship traffic as well as the sailing of military ships, which called for accurate maps and geographical descriptions. In 1847, Lieutenant I.M. Zherebtsov made a first complete hydrographic description of Kara-Bogaz-Gol Bay (subsequently, it was made part of the 1878 General Map of the Caspian Sea). In 1858, investigations of the Caspian Sea commenced by the expedition of the Marine Department lead by Rear-Admiral N.A. Ivashintsev, investigations of which ended 10 years later, and in 1871–1874 were continued by Lieutenant-Commander N.L. Pushchin. On the strength of these works published in 1877 and 1878, a General Map of the Caspian Sea was drawn coupled with 25 detailed maps of various segments of the Caspian Sea, 24 accurate plans, and 2 atlases.

Caspian Sea, Names – the number of historically verified names for the Caspian Sea is 50–60, at minimum, and, including various versions, up to 70. The names of the Caspian largely originate from the names of peoples, regions, and cities of the Circum-Caspian areas. The current name of the sea has to do with the name of the Caspians people who inhabited the area in the 1st millennium B.C.E. and is first encountered in Homer (1100–1000 B.C.E.), who writes about the “Pond of the Sun . . . where the Orb of day goes to rest every day so as to make its circular path once

again on Helios's fast horses." According to Homer, "The Pond of the Sun" is a bay of a deep and smooth-flowing world river Ocean." Just a bit earlier, in Avesta's holy books (1100–1200 B.C.E.), CS was designated in the Middle-Pahlavi Language of Avesta *Vouru-Kisha* ("extensive water body," "extensive basin"). In Assyrian cuneiform inscriptions (eighth–seventh centuries B.C.E.), it was referred to as the Great Eastern Sea. In the Greek historian and geographer Hekatei of Miletus (six century B.C.E.), the sea is referred to as *Caspian* or *Hircanian*. (The former one is based on the ethnonym "Caspians", while the latter one stems from the name of the country Hircania. Both of these names are used by Herodot (fifth century B.C.E.), and some believe he was the first to call the sea Caspian.). Reference to the *Hircanian Sea* is found in Aristotle's ancient communications (fourth century B.C.E.), as well as in writings of Strabon, Eratosthenes, Pomponius Mela (second century B.C.E.), and Curcius Ruth; *Persian Sea* and *Ircan Sea* are referenced in Ptolemy's chronicles.

More recent classical have variably referred to the sea as: *Albanian Sea* (from the ethnonym "Albans") by Pliny the Second and *Rough* by Horace Flank; the Arabs used to call the sea *Hircanian*, *Abescun*, *Dailem*, *Jurjan* (Arabic form of Hircanian, Hurcanian); medieval geographers and writers Ibn-Hordadbeh (circa 847), Ibn-Jacub (Ija-cut), Al-Farghani, and Ibn-Ruste (between 903 and 913) – *Kulzum*, *Hazar* (Massoudi, circa 950); Istahri; Cazvini, Hafiz-Abu – Bahru-Hazar; *Jilan* (Cazvini), *Gurgan* (Ibn-Jacub), *Gilan* (Firousi), *Tabaristan* (from the name of Circum-Caspian Region), *Salyan* (from Salyan Khanate), *Dailem* (from Dailem Mountains), *Derbent* (from Derbent City), *Rough*, *Mucan* (from Massoudi's Mucan City), *Horosan* (from a region in the south-eastern part of the Caspian Sea – by Ibn-al-Fakikh), *Bab* (Ibn-Ruste).

In ancient Russian written monuments, the Caspian Sea is mentioned under the following names: *Blue Sea* (some researchers believe this refers to the Aral Sea and suggest that in the Golden Horde the sea was referred to as White Sea), *Khvalis* (by the name of the people "Khvalis people" who dwelled near the Northern Caspian), *Khvalyn* (dist. Khvalis), *Khoresm* (from the ancient state on the lower reaches of the Amu-Darya that was partly situated on the Caspian shores).

Marco Polo (thirteenth century) for the first time ever refers to the *Abakku Sea* or *Sea of Abako* (i.e. the Baku Sea).

The oriental writers of the thirteenth century referred to the Caspian as *Tailesan*, *Iberia*, and *Guz Sea*. The Franciscan monk Odorico da Pordenone (1318–1330) referred to it as the *Bakuk* (Baku).

Idrisi (Arab geographer of the sixteenth century) called the sea the *Georgian*; in Marino Sanuto's map of 1320, it is referred to as the *Sara Sea*; in the maps of A. Olearius (1647) it is the *Gulzum Sea*, and in maps of J. Ottens (1722), the *Bohar-Corsun*, which is the name given by the Moors.

A.Contarini, the Ambassador of the Venetian Republic to Persia (1474–1477) called the Caspian the *Baku Sea*. The Russian merchant of Tver A.Nikitin wrote of "the first sea – that of *Derbent*, *Darya* (Pers. – sea) of *Khvalis* (from Khvalises – ancient Russian name of the Horesm population)". In the notes of Don Juan Persian

(1560–1604) it is the *Gulsum*. At the end of the fifteenth century, the Venetians Anjollelo and Donato da Leze refer to the Caspian as the *Bakuk Sea* or the *Bakkara Sea*.

By the name of contiguous countries, provinces and cities, the sea was called *Mazandaran* and *Pahlavi*, Russian, *Astrakhan*, *Saraiin* (by the name of Sarai, the capital city of the Golden Horde), *Saransk* (to quote oriental authors and more recently the Dutchman Dapper, 1672), *Shirvan*, *Muhan*, *Salyan*, *Kamrud*, *Tailesan*. Besides, the various peoples that inhabited the Caspian seashores called the city their own way: *Avar*, (Avar Language), *Shizir*, *Hurzam*, *Dorca* (Pers.), *Kukkuz*, *Hazar derya* (Turkm.), *Kutsgun-Deniz*, *Kuchuk-Denis* (Turkish), *Ag-Deniz* (Tatar).

Caspian Sea – Persian Gulf – Canal – the idea of building a navigable canal linking the Caspian Sea with the Persian Gulf was first voiced in the 1970s. The design of the canal was prepared by Iranian hydrological engineers. The canal would be nearly 600 km long, of which 350 km would run along the fairways of the rivers of West and Southwest Iran. The canal would link the Kyzyluzen and Karkheh Rivers. The estimated cost of canal construction is around USD 6.5–7 bn. If the canal project is implemented, a water transport system would be established that unifies Russia, the Baltic States, North European countries, and the Persian Gulf.

Caspian Sea Pilot – prepared by the British Captain-Cartographer Thomas Woodruff (1740–1743), has lived to these days. Its full translation is published in the “Caspian Sea Pilots. Eighteenth Century Lists.” The first Russian CSP was prepared by N.L. Pushchin based on the materials of hydrographic operations performed from 1854 to 1874, and was released in 1877. In 1897 and 1908, the Pilot was reprinted with minor changes and addenda. In the USSR, the Pilot was reprinted many times.

Caspian Sea Pollution – adverse changes of marine environment parameters caused by harmful substances flowing into the sea as a result of anthropogenic impacts: physical pollution (radioactive, thermal), chemical (oil, heavy metals, oxides, etc.), biological (microbial), mechanical (littering). The level of pollution is controlled by various standards, above all being the maximum permissible concentrations (MPC) and total pollutant index (TPI). Subject to these criteria, appraisal of the sea water quality ranges from clean to heavily polluted. The quantity of pollutants (P) arriving and existing in the sea may vary significantly, which makes it difficult to give a generalized appraisal.

The Caspian Sea is Eurasia’s largest area of inland runoff, encompassing major industrial regions of Russia and the Caucasus: it is constantly inundated with growing human-induced impacts. Crucial to the Caspian is chemical pollution. All major kinds of this pollution can be found in the sea, yet oil and oil products (OP) and phenols are of primary importance; as far as the North Caspian is concerned, this applies to synthetic surfactants, too. The available data indicate that by the early 1990s, the

annual input of pollutants in the Caspian Sea averaged (in thou t): OP – over 100, phenols – under 1, synthetic surfactants – over 3, copper and zinc – 9. This list is definitely not inclusive, as other heavy metals, pesticides, and many other pollutants are found in the sea. The heaviest P input arrives in the Caspian with the flow of the rivers. Above all, the Volga contributes around 85% of OP and phenols; and around 80% of synthetic surfactants, most heavy metals, and insecticides (DDT). MPC of P in the lower reaches of the Volga are constantly noted to be several times as much. During the last several decades, eutrophication processes in the Volga delta have developed, which has been conditioned by intensive arrival (a doubling) of organic substances (nitrogen, phosphorus).

In the Northern Caspian, the water area adjoining the Volga delta is the most polluted. Of great hazard is the input of oil in the sea near the Mangyshlak Peninsula, where rich fields are being developed (Tengiz and others). Secondary pollution of sea water occurs on shoals as the sea level rises and P is leached out of the bottom sediments. The transformed Volga runoff, coupled with Terek and Sulak runoffs, pollute the Daghestani sea coast.

The most heavily polluted areas of the Caspian Sea also include the water area near Apsheron Peninsula, which receives industrial effluents and domestic water of the major industrial centers Baku and Sumgait; subsea oil recovery is also carried out there (Neftyaney Kamni and other locations). Much of the offshore and coastal field oil is wasted in the course of oil prospecting, recovery, transportation, and in emergencies when vast fields of drifting oil film are formed. Maximum area of oil spills may be as large as 800–1,000 km². OP content in the sea surface layer, according to mean long-term data, equals 0.2–0.3 mg/l in the coastal zone. By and large, the Caspian is among the dirty seas of the world. The Northern Caspian waters as well as coastal waters of the Middle Caspian are largely regarded as dirty, while the rest of the sea water area is polluted.

CSP suppresses the activity of hydrobionts, causes diseases in fish, and spoils their gustatory properties. Pollution leads to decreasing primary production, reduction of fish feeding and spawning areas, and disturbance of fish migration routes. There have been cases of mass waterfowl mortality due to oil spills in the sea. The quality of the marine environment also determines the conditions for recreation in the sea coastal zone (Daghestan, Azerbaijan).

The actions taken to combat CSP have made it possible to reduce pollution growth, yet this has been inadequate thus far for a decisive improvement of the situation to have been seen. At present, there have emerged new difficulties in handling the problem associated with overall assessment of marine environment because since the early 1990s regular observations of marine pollution have nearly ceased altogether. The situation is further compounded by the growing rate of developing new coastal and offshore oil fields. A unified, coordinated service to monitor the Caspian natural environment based on scientific-and-technical cooperation among the Caspian states must be revived. The pressing problem is the development of an international Caspian Sea monitoring program and adoption of a convention for rational use and protection of its natural resources.



Potential environmental hazards in the Caspian Sea Region (2007). In *UNEP/GRID-Arendal Maps and Graphics Library*. Retrieved 21:02, May 22, 2009 from <http://maps.grida.no/go/graphic/potential-environmental-hazards-in-the-caspian-sea-region>

Caspian Sea Shipping Company – established in 1859 in Baku as the joint-stock company “Kavkaz i Merkurii” (“Caucasus and Mercury”), in 1902 as a subsidiary of the Baku Merchant Fleet. It operated 5 ports: Baku, Krasnovodsk, Makhachkala, Bautino, and Bekdash; the sea railway ferry Baku-Krasnovodsk; the Ship-building Industrial Association “Caspvorsudoremont”; the Astrakhan Maritime Fleet; 2 nautical schools (at Baku and Astrakhan); a computer center; and 3 maintenance depots. Its fleet included 80 ships of about 350 thou t combined dwt.

Caspian Seal (*Phoca caspica*) – one of the 19 species of a true seal family. CS is an aquatic mammal (Pinnipedia order). This species is of Arctic origin and penetrated from the north during the post-glacial period. The body is slim, 125–150 cm long with a mass of 70 kg on average. Despite being short, the body is relatively thick. The neck is not long, and the head is small. The color is variable, depending on the age. The back exhibits a darkish background, while the belly tends to be a light-gray. Dark-gray, brown, sometimes almost black spots are scattered all over the body. The spotty pattern on the back is pronounced more than on the belly. CS represents the Arctic faunal complex. While omnipresent in the sea, it occurs in large numbers in the Northern Caspian only. In winter, it congregates within the ice zone of the Northern Caspian, and after ice-melt, it spreads all over the Middle and Southern Caspian. The seals propagate and mates on the ice of the Northern Caspian. Females reach sexual mature at the age of 5–6 years and give birth to a large calf of up to 75 cm in length and weighing 3–4 kg. After that, she breeds each year. In summer, the seals tend to keep to the open water of the Middle and Southern Caspian, while in autumn they bunch up in the north-eastern part of the sea, where they lie down in compact groups. They feed on fish, Cephalopoda mollusks, and crustaceans (gobies, kilkas, sand smelts, shrimp, and fresh-water shrimp). Sometimes, they feed on herring and roach. Kilka accounts for 86% in the seals’ annual ration, and during summer fattening up to 90%. For this reason, during the fattening period, seals assemble where there are large schools of kilka.

Ambrosio Contarini in 1475 gave this description of seals in the Caspian Sea: “They also catch one other fish species there, 1.5 elbows in length, thick and almost round, so one is unable to see either the head or any other limbs. They prepare some special liquid from these animals, which is burned for lighting or used as an ointment for camels. It is traded all over the country.”

In the past, the stock of CS equaled 1 million heads, but lately it has dropped to 500–600 thou, of which roughly 100 thou are females involved in reproduction. From 1867 to 1915, the annual yield of CS used to average 115 thou heads, from 1930 to 1940 it was 160 thou, while in 1941–1950 it was only 45–60 thou heads. After enforcement of restrictions on seal hunting on islands and afloat, the level of seals hunting remained low. In 1967, the hunting of adult seals was banned, and in 1970, the hunting of pups (newborn harp seal) was limited to the maximum of 40 thou specimens, which was conducive to growth of the seal population. Since 1998 there has not been seal hunting due to economic reasons.



Caspian seal (http://mammals.ru/animal/lastonogie/semeystvo_143930.htm)

Caspian Sigmoid – expression often used in geological literature when referring to the peculiar shape of the Caspian Sea, which is attributed to tectonic causes that were responsible for uplifts and subsidence of various areas of the sea.

Caspian Summit – the first meeting of presidents of all 5 Caspian countries held in Ashkhabad on April 23–24, 2002. The main goal was to come to terms on the international legal status of the Caspian Sea. The parties exchanged opinions on various matters: rationalization of transport links, development of regional economic cooperation, transportation and purchase/sale of natural gas, the environmental situation, and the improvement of mutual understanding in foreign-policy matters. Prior to the summit, Russia, Azerbaijan and Kazakhstan had already brought closer their stands on the subject of Caspian delimitation. The RF President proposed to establish an intergovernmental center for environmental monitoring, but no joint declaration on the summit was signed. It was agreed to continue summits in the same format on a regular basis.

“Caspian Today” – monthly economic journal, established by the monthly newspaper “Economy of Asia.” Published in Mashad in Iran. The journal publishes articles dealing with the state of the economies and economic developments in the countries of Central Asia and the Caspian Region.

Caspian Trout – see *Caspian Salmon*.

Caspiana – ancient name of an area within the city of Bailakan at the point of confluence of the Araks and Kura Rivers, Azerbaijan. Strabon used to regard C. as part of the Albanian land.

Caspians – Name given by the Greeks to ancient Caucasus tribes of nomad stock-breeders (horse-breeders) that lived at the southwestern part of the Caspian Sea in East Azerbaijan (1st Millennium B.C.E.). C. is believed to be the true origin of the name of the Caspian Sea. According to Hellenic writers, it was the name of “Scythian” people, and name C. was used as early as at the time of the Persian

king Darius I (522–460, B.C.E.). Speaking of C., Strabon says that “Albanian lands also include Caspiana, thus called after the name of the Caspian people from which the name of the Caspian Sea originated and whose people no longer exists”. C. included the tribes of Scythian and settled seaside northern people who used to inhabit the Circum-Caspian area. From the mouth of the Araks River to the mouth of the Oks (Uzboi) River, these people were also called Hircanians; therefore, in Hellenic geography the name of the Caspian Sea was invariably accompanied by the word “or Hircanian.”

“**Caspii**” – jack-up drilling rig manufactured by Astrakhan-based association of manufacturers “LOTOS” (derrick gantry), “Krasnye Barrikady” (pillar strings and pontoons), “Elling” (helicopter pads), and “Sea Ship-building” (pontoon).

Caspiisk (until 1947, Dvigatelstroi Settlement) – city subordinate to the republic that was established in 1932. Situated on the shore of the Caspian Sea in the Circum-Caspian Lowland, 14 km south of Makhachkala, its industrial satellite, in the Daghestan Republic. Population 83.4 thou people (2009). Industrial enterprises include fine mechanics, fish-canning, a number of building works, light industry and food-processing. In the coastal “urban” strip, there are shops of “Dag-diesel” plants, which are combined heat and power plants. Twice Hero of the Soviet Union Test Pilot S. Akhmet-Khan Museum and Regional History Museum is also here. The city shore zone is 4.5 km wide with a harbor in the center.

Caspiisky – settlement on the shore of the Caspian Sea, Republic of Kalmykia, Russia (called Lagan before 1944).

Catchment – see *Catchment Area*.

Catchment Area (of a river, lake) – part of the earth surface from which all surface runoff water (rain water, snow-melt, etc.) flows into water bodies. CA of a river into which tributaries flow is made up of the CA of each of these tributaries; the CA of each such tributary, in turn, is determined as a sum total of the CA of balkas, streams, ravines, etc. flowing into it. The CA of any water course or water body is also referred to as its basin. The CA of the Caspian Sea is enormous, over 3.1 million square kilometer; however, the river runoff is not shaped up on the whole of this area since a significant part of it is under desert plains, from which no moisture contributes to the sea (Buzachi, Mangyshlak, Ustyurt, Cheleken, and others). Therefore, the actual CA of the Caspian Sea is around 2 million square kilometer.

Caucasia, Caucasian Isthmus – territory between the Black, Azov, and Caspian seas stretching 720 km from 47° to 39°N, from the Kumo-Manych Depression in the north till the border of Georgia, Armenia with Turkey, and Armenia, and of Azerbaijan with Iran in the south. The area is 440 thou km². C. is often divided into North C. and Transcaucasia. The mountain system of the Greater Caucasus is divided, lengthwise into West C. (as far as Elbrus Mt.), Central C. (between Elbrus Mt. and Kazbek Mt.), and East C. (east of Kazbek Mt.). The C. is dominated by a mountain relief.

Centrally located is the mountain system are the Greater C. (GC), whose axial zone includes the Main or Water Divide Range, the Lateral Range (the highest points – Elbrus Mt., 5,642 m), and (Kazbek Mt., 5,033 m). The GC ranges are distinguished by Alpine relief forms and resemble cuervas with karst phenomena (Vorontsov Cave, New-Afon Cave, Sataplia, and others). Circum-Caucasia stretches from the northern slope of GC to the Kumo-Manych Depression and separates the Stavropol Upland (height up to 831 m) from Kuban-Circum-Azov and Terek-Kuma Lowlands. To the south of the GC lie the Kolkhida (in the west) and Kura-Araks (in the east) accumulated Lowlands, and separating the GC from the Transcaucasian Upland, which consists of wrinkled ranges of the Minor Caucasus (Gamysht Mt., 3,724 m) and the volcanic Armenian Uplands (the highest point – Aragaz Mt., 4,090 m), in the southeast are the Talysh Mountains (height up to 2,492 m) and the Lenkoran Lowland.

C. is endowed with oil and gas fields, deposits of coal, iron ore, manganese, copper, molybdenum, lead, zinc, and other minerals and mineral springs.

C. is situated within the borders of the temperate and subtropical climatic belts. The mean temperature in January in Circum-Caucasia is from -2 to -5°C and in Transcaucasia it is from 6 to 3°C in the Lenkoran Lowland. In summer, the difference in temperatures between the western and eastern parts of C. is more pronounced. The mean temperature of July in the west is 23 – 24°C , in the east 25 – 29°C . In the mountains at the height of 2,000 m in January, the temperature averages -8°C and in August (the warmest month), 13°C . Still higher, the cool Alpine climate is superseded by a nival climate of high ridges. The amount of atmospheric precipitation on the plains is from 200 mm (Kolkhida Lowland) to 180 mm (Kura-Araks Lowland), in the mountains is 2,500 mm, and on the windward western and southwestern slopes is up to 4,000 mm/annum. There is considerable glacierization (nearly 2,000 glaciers, the largest being Dyh-Su, Bezengi, Karaugom, and Zanner, of 1,428 km² combined area). The rivers of C. are of the Caspian (Kura and Araks, Sulak, Terek, Kuma), Black (Rioni, Inguri) and Azov (Kuban) Seas. As far as lakes are concerned, the largest one is Sevan (Armenia).

The typical feature is a great diversity of landscapes conditioned by the height of climate belts. The southern slope of the GC, the northern slopes of the Minor C., and the Talysh Mountains are dominated by subtropical forest landscapes featured by broad-leaved and coniferous forests. The high mountains of the Greater and Minor C. as well as of the Armenian Upland exhibit Alpine short-grass meadows, while more continental areas have meadow steppes. On the highest ranges, glacial-nival landscapes prevail. Of the plain landscapes of Circum-Caucasia, steppes are most prominent, whereas Transcaucasia is dominated by semi-deserts. Mountain areas of the Greater and Minor C. are inhabited by forest and high-mountain fauna that includes endemic species (west-Caucasian and Daghestan turs, Caucasian black grouse, Caucasian snowcock) and even genera (Prometheus' mouse) as well as species also common in Western Europe (chamois, *Cervus elaphus*) and those that are generally widespread (bear, lynx, fox). Mountain fauna of the Armenian upland is associated with Asia Minor (Asia Minor souslik, Asia Minor mountain jerboa and

others). There are numerous protected areas within the C.: Caucasian, Teberdian, Kabardino-Balkarian, and other reserves.

C. is one of the major health resort areas: Caucasian Mineralnye Vody as well as groups of health resorts on the Black Sea coast. C. is also a major tourism and mountain climbing center.

Caucasus Province – established in 1785 as Caucasus vice-regency and including the Caucasus Region (Aleksandrovsky, Yekaterinogradsky, Georgievsky, Kizlarsky, Mozdoksky, and Stavropolsky Counties) and the Astrakhan Region (Astrakhansky, Yenotaevsky, Chernoyarsky, and Krasnoyarsky Counties). The center was Yekaterinograd until 1790, then Astrakhan. Its population was 48.3 thou people, with 400 families. At the end of 1796, CP was renamed Astrakhan County. In 1802, CP was again separated from Astrakhan Province (5 counties, center-Georgievsk). In 1822, CP was renamed the Caucasus Region.

Caviar – foodstuff obtained by means of treatment (mainly, salting) of the eggs of sturgeons (great sturgeon, sturgeon, stellate sturgeon, barbel sturgeon), salmons (chum salmon, humpback salmon, blue backed salmon, black salmon, coho salmon, salmon), and scale fish (pike perch, common carp, pike, roach and others).

Black caviar (BC) – caviar of sturgeon species. BC is made from unprocessed caviar of beluga, great Siberian sturgeon, sturgeon, stellate sturgeon, and starlet. BC is obtained from the reproductive organs (hard roe) of female fishes. A most nutritious, valuable, and tasty food product. It contains a considerable amount of complete proteins, fat, and vitamins. By caloric value, it is superior to meat, milk, and other products. 100 g of caviar supply 280 kilo-calories to the organism. One ounce (28.35 g) is regarded as a normal serving of caviar.

Common in the making of all granular caviar items, except hard roe, are the following operations: splitting of hard-roe fish, removal and grading of hard roe, and screening (separation) of caviar, making up a granule batch.

Caviar quality is determined by the size of granules, their color (Russian caviar is graded as light-gray, dark-gray, and black) and by fat content: the larger and lighter the caviar, the higher its quality. The color and size of granules depend on the age of the female fish and its alimentation.

They distinguish between the following types of caviar:

- *Beluga caviar* – its color varies from light- to dark-gray, when packed, is closed with a blue cover;
- *Stellate sturgeon caviar* – usually is referred to as “black,” and when packed it is closed with a red cover;
- *Sturgeon caviar* – blackish, brown-golden, amber-yellow. When packed, it is closed with a yellow cover.

Subject to processing procedure, the caviar is subdivided into granular, light-salted, canned, and heavy-salted barrel-packed, pasteurized, processed pressed and

hard-roed. Subject to the caviar-making process, caviar can be light-salted fresh, light-salted pasteurized, or processed pressed.

To preserve BC, it is subjected to immediate canning. The following canning techniques are used: salting with dry salt, brining in a saturated salt solution (without heating); brining in a heated saturated salt solution with subsequent caviar pressing; brining with subsequent pasteurization; and salting with subsequent sun-drying.

Caviar is served with vodka and wine as well as with butter and eggs. As a matter of tradition, caviar is served laid with ice. The world market price of stellate sturgeon caviar varies up to USD 1,500/kg. One kilogram of beluga caviar may cost upward of USD 10,000. The main countries producing BC are Russia, Iran, and Azerbaijan. The top quality BC is fabricated by companies registered with the EU Commission on Quality.

Caviar in bags – pressed caviar of premium quality.

Caviar man – an expert at sorting raw caviar of sturgeons and other fish species, and making granular, processed pressed, hard-roed caviar; hard-roed fish; browned caviar rounded cake.

Caviar of fishermen's making – caviar made by fishermen.

Caviar-throw – pressed, hard-salted caviar with no aroma, made by fishermen of hypermature eggs of "soft grains" that get burst when hard roe is passed through a caviar sieve.

Fishery-processed caviar – caviar made at a fishery.

Granular caviar (GC) – caviar obtained from the recently killed great sturgeon or sturgeon (hardly ever from stellate sturgeon), and passed through a caviar-sieve and slightly salted with dry salt. The best GC is that of great sturgeon, followed by sturgeon caviar, with the stellate sturgeon caviar coming third. Only full roe is used for making GC, when eggs are separated easily from conjunctive tissue and from one another. The grain must be hard enough, elastic, and uniform in size and color. In no case should caviar be moist. Caviar must be stored at a temperature from 0 to -3°C before being pasteurized and packed in various ways: in Russia, normally in 56 or 113-gr glass cans or in 90-gr tins; and in Iran, in 100, 200 and 300-gr glass cans. Caviar can be stored for 12–15 months, provided the storage conditions are complied with. Nearly all caviar sold in Europe is slightly salted. The salt content in it varies from 2.4% (common to Iranian caviar) to 4.4% (common to Russian caviar); a low salt content improves gustatory properties of the caviar, but shortens the storage period. Boric acid, urotropine, or borax is used as a preservation agent or antiseptic; borax is added to caviar in this proportion: 4 gr of borax/1 kg of caviar.

Hard-roed caviar (HRC) – caviar made from the immature fat hard roe or roe with a very soft grain, without the grain being separated from the connecting tissue. The hard roes of sturgeon fishes are pre-cut into pieces of 10–20 cm in length. This done, they are brined in a saturated brine and heated to $45\text{--}50^{\circ}\text{C}$. The caviar is not cleaned from the film (i.e. it is in a kind of a "small bag"). The brining lasts 5–10 min, sometimes longer, depending on the size of hard roes. Sometimes. HRC is brined in a cold brine, then the duration of brining lengthens to 35–40 min. The

brining over, hard roes are kept on grilles for 2–3 h for the brine to drip down. HRC is not subdivided by sturgeon species.

Head caviar – the best choice caviar of beluga (great sturgeon).

Muddy caviar – pressed caviar with a natural muddy odor.

Pasteurized caviar – made of 1st or 2nd grade pressed caviar with or without antiseptics added. The grain may be hard and with a soft capsule of any size and color. The caviar is packed in 28.56 and 112-gr glass cans that are hermetically sealed with lithographed tin covers under vacuum and are pasteurized. The cans are heated in water baths or high-pressure sterilizers up to a temperature of 60–65°C (at the can center), then the cans are cooled, checked, and packed. Pasteurized caviar is not subdivided into grades. The requirements to its quality are the same as to pressed caviar 1st grade with an allowance of slight muddy flavor and piquancy. Given these gustatory properties, the pasteurized caviar is regarded as standard. The off-the-shelf product is suitable for storage at 0°C for a year.

Processed pressed caviar (PPC) – unprocessed caviar (mainly of sturgeon and stellate sturgeon) is brine salted. The brine is pre-boiled; after caviar is placed in it, its temperature must be within 40–42°C. Salt curing lasts 1.5–2.5 min. The caviar thus salted is then pressed in fabrics. 3.5–4.0 kg of fresh granular caviar yield 1 kg of processed pressed caviar. The best processed pressed caviar is that of stellate sturgeon. Good processed pressed caviar contains mainly eggs of stellate sturgeon. PPC looks like a homogeneous mass. Such caviar is obtained from fatty grains of stellate sturgeon, but it is also made of a mix of stellate sturgeon and sturgeon caviar. A good PPC has a uniform and mild but not watery texture, a tender low-salt taste, and as peculiar aroma. Such caviar cannot be stored longer than 8 months. During the Soviet period, Achuev PPC (processed at Achuev Fish Processing Factory) became particularly popular with connoisseurs thanks to its gustatory qualities. In old times, hypermature caviar or caviar that stayed in the caught fish for a long time and could not be separated from the films, used to be salted in paüses (i.e. hard roe). Presumably, the name stems from the Russian word “*pai*” – share (i.e. the caviar obtained earlier by several fishermen together was divided among them according to their respective shares). It is produced, for the most part, in Azerbaijan and Russia.

Screened caviar – caviar of roach, carp, Azov roach, herring, bream, “red salmon” passed through caviar sieve, salted, and sealed in barrels: caviar cleared of hard roe films and salted with an addition of potassium nitrate (for color).

Watery caviar – granular caviar of fish that failed to spawn in due course.

Center for Study of Central Asia and the Caucasus – established in 1992 at the Division for Education & Research Affairs of the Ministry of Foreign Affairs of Iran. The Center collects information and creates appropriate research base for studies of these regions and coordinates the efforts and promotes the utilization of achievements in culture, arts, and intellectual spheres as well as wider application of the world experience. Beginning in 1999, C. published the quarterly journal “Amudarya” that carries articles about the Caspian problems in both Russian and English.

Central Asia – on the Eurasian continent, C.A. is understood as the territory of the former Soviet Republics of Turkmenistan, Uzbekistan, Tajikistan, Kirghizia, and Kazakhstan. Its area is 3994.4 thou km², and its population is 61.5 million (2009). On January 3, 1993, in Tashkent at the Summit of leaders of 5 Central Asian Republics, the commonwealth of these states was named “Central Asia.” The members of this commonwealth are closely linked by dozens of regional bilateral and multilateral international treaties in various fields, including important political treaties on friendship and cooperation.

“Central Asia and Caucasus Review” – a quarterly magazine published since 1992 by the Center for the Study of Central Asia and the Caucasus of the Ministry of Foreign Affairs of Iran. The Journal deals essentially with political, economic, cultural, historic, and social issues of the region.

Central Research Institute of Sturgeon Fishery (CNIORKh) – separated in 1964 from CaspNIRKh. In 1989 CaspNIRKh and CNIORKh merged once more.

“CentroCaspıi” (Central Committee of the Caspian Navy) – the highest elective body set up in the first half of 1917 in Baku. The first membership of “C.” was dominated by socialist-revolutionaries and Mensheviks, while the second membership was led by the Bolshevik A.R. Kuzminsky. After the fall of the Soviet power in Baku on August 1, 1918, “C.” established the anti-Bolshevist government, the so-called “CentroCaspıi Dictatorship”, which survived until September 14, 1918 when it fled at the approach of Turkish troops to Baku.

Chagalosor – a depression located near the northern tip of Kara-Bogaz-Gol Bay, Balkansky velajat, Turkmenistan. The bottom of the depression is 45 m below the Caspian Sea level and represents the lowest point on the Caspian Lowland in Turkmenistan.

Chala – a flat depression, a flat closed trough, hollow and invisible in relief; ephemeral lake; marsh (Azeri). Ch. is distinguished by rich and variegated vegetation. Ch. is also used for so-called “chala” irrigation – the lowland is flushed with water from a river or irrigation canal (Kura-Araks Lowland in Azerbaijan).

Chaloos – a river on the Iranian coast of the Caspian Sea that flows into the sea 2.5 km to the southeast of Cape Chaloos known for its shallow depth. It flows west of Nowshahr. Its length is 85 km, with a width of 60–80 m. This is a quick and full-flowing river with cliffy banks and a stony bed. At inflow into the sea it spreads into several arms. The mouth is crossed by a bar 0.3–0.4 m deep. A fishery is developed on the right bank.

Chaloos – a small resort town 5 km westward of Nowshahr on the Caspian coast, Mazandaran, Iran. Ch. is a suburb of Nowshahr.

Channel – a small river connecting two lakes or two basins; a river arm or delta branch; old channel and also a new channel, recent scour. On the Caspian there are

the following channels: Tishkovksy Yama, Karalatsky Borozdina, Kanyginsky and others (Atyrau Region, Kazakhstan Republic).

Chastik Fish – a fishery term describing fish that is caught with the chastik (small-mesh) net. Among large C.f. are common carp, bream, pike perch, pike; and among smaller fish are sabrefish, crucian carp, and some others (except sprat and anchovy).

Chechen Island – located in the northwestern part of the Caspian Sea, 120 km northward of Makhachkala and the Agrakhan Peninsula, RF. It is separated from the Yaichny Island by the shallow Chechen passage. Its length is 12 km, its width is up to 5 km, and its perimeter is 35 km. The surface is flat. Sandy bars overgrown with canes stretch from the coast into the sea. It has been known since the seventeenth century. In A. Schekatov’s dictionary (1808) it is said that the island is located “opposite the mountain the Chechens inhabit.” This was a place of exile in Tsarist Russia. In 1918, the English placed a naval airfield here to attack Astrakhan and bombard the Volga fleet based there.

Chechen Islands – a group of islands located near the northern tip of the Agrakhan Peninsula, Daghestan. It includes Yaichny, Chechen, Bazar, Pichugin, Pichuzhonok, Prygunok, and some smaller islands. They are separated by shallow passages from each other and from the Agrakhan Peninsula. All islands are composed of sandy formations.

Chechens (self-name – *nokhchyi*) – people living in the Chechen Republic of the Russian Federation (1.2 mln people in 2009), in Ingoushetia (95.4 thou people in 2002), Daghestan (87.9 thou people in 2002), etc. They speak the Chechen language of the Nekht group of the Iberian-Caucasian languages and are Sunni Moslems.

Chechensky Lighthouse – located on the western tip of the Chechen, Daghestan. It was constructed in 1863. It is a round stone tower rising 41.1 m above the sea level.

Chekishlyar (Chekichler) – an urban-type settlement located 11.5 km northward of Esenguli settlement on the eastern coast of the Caspian sea, Balkansky velajat, Turkmenistan. It has a fishery.

Cheleken (Turk “*chel*” meaning desert) – presently called Khazar. In the past it was an island and now (2010) a peninsula on the eastern shore of the Caspian Sea to the west of the Kelkor Depression and its two arms are linked with the Caspian and the oilfield Nebitdag in the Balkansky velajat (formerly Krasnovodsky Region), Turkmenistan. The Persian name is *Chearkan*, meaning “island of four riches.” G.S. Karelin noted that four kinds of oil were produced here: naftagyl – solidified sticky tar of black color used for blacking ships and for making torches; ordinary black oil; pyrdyum – the purest colorless oil; yangi-tyufya – lower-grade ordinary oil. Analysis of ancient data reveals that Herodotus meant, in fact, Ch. when he mentioned an island on the Araks River (Uzboy). For the first time it was marked on a map in 1715 by A. Bekovich-Cherkassky as Chereken Island. On some maps of the

eighteenth to nineteenth centuries it was marked as Neftyanyoy. It was formed of an island of the same name that was linked after 1937 to the mainland due to the water level drop in the Caspian Sea and drying of a shallow-water area between the island and the mainland. Looking at the island from the top, it may be likened to a flying bird heading to the Caucasus ridge towards the Apsheron Peninsula. Its right wing is directed meridionally from south to north, which is the Northern Cheleken Spit or the Kafaldja Peninsula. The left wing is directed from north to south and is the Southern Cheleken bar; this is the Dervish Peninsula.

The area is about 500 km², with a length of about 40 km and a width of 22 km. The relief is mostly flat. The Ch. western shore in its central part is rather cliffy (heights here up to 25 m). To the north and south it tends to lower and passes into slightly hilly long sandy bars. The eastern shore is low and sandy. The central part of Ch. is covered by highlands (up to 100 m high) of the fault origin that are called as a whole Chokrak. They are composed of limestones and sandstones. Vast areas are occupied by hummocky sands, crescent bakhans, and solonchaks – takyrs. In the southwestern part of the peninsula are found small lakes, some of which have a rose coloring due to a high content of purple bacteria. Precipitations here are up to 150 mm a year. About 370 mineral sources (ferrous, saline) are found on Ch. Deposits of oil, rock salt, mica, and natural gas are also located here. A fishery has been developed. Cheleken ozokerite became known from the second half of the nineteenth century; paraffin and mineral wax were produced from it. From time to time, Ch. becomes an island due to the water level rise in the Caspian. Active surge waves in July 1995 turned Cheleken Peninsula into an island.

Cheleken, City – see *Khazar*.

Cheleken Northern – the inner bay of the Krasnovodsk Bay of the Caspian Sea near the northern coast of Cheleken Peninsular, Turkmenistan. It is separated from the sea by the Northern Cheleken Spit. Its length is 20 km, and its width is about 25 km. The Northern Ch. is shallow, and its coast is low and mostly sandy.

Cheleken-Ogurchinsky Strait – connects the Caspian Sea with Turkmen Bay lying between the Southern Cheleken Spit and the Ogurchinsky Island in Turkmenistan. The strait is wide and shallow. The depths in it are permanently varying due to the wave effects, currents, and Caspian Sea level variations.

Cheleken Shouthern – the inner bay of the Turkmen Bay of the Caspian Sea near the southern coast of the Cheleken Peninsula. It is separated from the sea by the low-lying Dervish Peninsula and the Southern Cheleken bar. Its length is about 20 km, with a width of 35 km and a depth of 5–7 m. The coast is low.

Cherni – low coasts of the Caspian Sea. From the sea these coasts seem black against the generally light water and clear sky. “Go over cherni” means closer to the coast; low coasts overgrown with cane, cattail, and water nut.

“Chertovo Gorodische” (Devil’s city) – a Baer’s hillock located not far from Ikryanoye settlement. In 1979, it was given the status of a monument of nature

of federal significance. Such measure was needed to stop its further devastation due to human activities. Ch.G. is not only a landscape but a historical monument. It has been known from the times of Boris Godunov and was mentioned in the “Book of Great Drawing” in its explanatory note to a map of Russian lands. In the fourteenth century, the hillock was an island with a military settlement of the Golden Horde. In 1395, the fortress was captured and burnt by Timur’s troops. The settlement was destroyed and its ruins received the somber name “Ch.G.”

Chikhachev Pyotr Aleksandrovich (1808–1890) – Russian naturalist and geologist who was an Honorary Member of the Petersburg Academy of Sciences (from 1876), Honorary Member of the Russian Geographical Society (from 1890), and of many other academies and societies. From 1834 to 1836, he worked in the Russian Embassy in Constantinople, Turkey.

Ch. is one of the first Russian naturalists who studied orography, geology, paleontology, and plants of West Europe (Italy and France). He prepared a geological map of the Apennine Peninsula. By the results of his trips over the Altai and northwestern Caspian (1842), he published in 1845 geographical and geological descriptions of these regions and Kuznetsk coal basin. From 1846 to 1863, he took part in several expeditions to Asia Minor as a result of which comprehensive descriptions were published. In 1877–1878, he traveled over Spain, Algeria, and Tunisia.

In 1890, he published the article “Aral-Caspian Depression” in “Revue Britannique”.

Chilim (*Trapa natans*) – a water chestnut that grows in the Volga delta and is entered in the Red Book. These are “horned” black nuts up to 50 cm in diameter. Their white, sweetish kernels are eaten by wild geese and boars. They are edible for humans, too. Fishermen gather up to 5 thou kg of these nuts from one hectare of the water surface.



Chilim (*Trapa natans*) (<http://content.foto.mail.ru/bk/mc.34/454/i-942.jpg>)

Chilmamedkum Sands – a sandy terrain located in the depression between the Krasnovodskoye and Ustyurt plateaus in the west of Turkmenistan. It fills the synclinal trough with Apsheron marine material. The greater part of Ch.S. is covered by slightly overgrown sublatitudinal steep-sloping large ridges (20–25 m). In the western third of Ch.S., deep sands (up to 60 m) with barkhan spots are found over the western margins of the basin.

Chink, Ching is a deep, often vertically dipping cliff of a plateau in Western Turkmenistan and Kazakhstan. Chinks mostly occur near Southern Mangyshlak, Ustyurt, and the eastern shores of the Krasnovodsk plateaus. In the north of Turkmenistan, the coasts of the Caspian Sea have chinks 50–80 m high that pass near the sea into a beach zone from 20 to 100 m wide (by the late 1990 s). Such coasts are found in the north of the Kara-Bogaz-Gol Bay, extending from Sartak to Ch. of the Kendyrli-Kayansasky Plateau near Chagaly at a maximum elevation of 138 m.

Chirag – one of the major oilfields in the Azeri section of the Caspian Sea included into the “Contract of the Century”. It was discovered in 1985. It is located 135 km east of Baku. The sea depth here varies from 200 to 400 m. The oil reserves are estimated at 300 million tons.

Chistaya Banka Island – located 25 km to the southeast of Iskusstvennyi Island. In 1935, at a distance of 60 km southward of the Volga mouth, the underwater sandy bar was found that was called Chistaya Banka. In 1938, this bar turned into an island and fishermen started settling there. In 1951, the island area reached 20 km². During strong and prolonged surge winds, the greater part of the island is inundated.

Chubaraya Steppe – a semi-desert in the Caspian Depression with the specific development of soils and vegetation by spots formed by cereal grasses and thistles depending on the relief, composition of parent rocks, and moisture and salinity level.

Chvanov – an artificial island 7 thou ha in area created around Neftyanye Kamni. It was given the name of a tanker that sank here on its way to Astrakhan.

Chzhan Cyan (unknown – about 103 B.C.E.) – Chinese diplomat. In 138 B.C.E., he was sent by the Emperor of the Khan U Di dynasty to seek allies among far koechzhi living beyond the Hun lands. The envoys started to the west from Lunsu (to the north of present-day Lanchzhou) but were captured as soon as they stepped on the Hun lands. For 10 years, Ch.C. was in captivity. Only in 128 B.C.E. did the envoy manage to escape; he crossed the Central Tien-Shan by mountain passes and reached Central Asia. Then he visited the Pamir, Altai valley, Takla-Makan desert, and Lobnor Lake. He was again captured by Huns and was kept in captivity for a year. He escaped once again and returned to China. By his estimates he covered about 25 thou *li* (14.2 thou km). After returning home, Ch.C. prepared a report about his traveling that reached us in presentation of Sym Cyan. It follows from this

report that the traveling of Ch.C. was very important for extension of geographical knowledge in China and beyond its borders. Ch.C. discovered and told the Chinese people about the existence of the Caspian (Northern) and Aral (Western) seas and defined accurately where the most important rivers of Central Asia are flowing. The report contained information about the western part of the Asian continent up to the Persian Gulf and Mediterranean Sea and about India. Ch.C. correctly marked the route from China to India via Burma and Assam and over seas of Southeastern Asia. At the turn of the 2nd and first centuries B.C.E., the southern branch of the Great Silk Road went along this route. In 123–119 B.C.E., Ch.C. took part in successful campaigns against the Huns. Later on in the period from 118 to 115 B.C.E., Ch.C. went on a second mission to the western countries. Chinese historians connect his name with the appearance in China of alfalfa, grapes, pomegranate, cucumber, walnuts, and fig trees.

Cleina – inner-film in pneumatocyst of beluga, sturgeon, stellate sturgeon, and barbel sturgeon from which film fish glue is prepared.

Coastal Water Protection Zone – a territory adjoining water with a special regime is established for prevention of pollution, clogging, and depletion of waters.

Coastal Zone – the coasts together with the underwater shoreface. This is the zone of modern permanent land-sea interaction. Quite often in scientific works, the term “coast,” meaning the coastal zone, is preferred. Sometimes C.Z. is defined as a 3D space comprising the sea surface, water column, and seabed. This space is limited, on the one side, by the coastline, and on the side by the lower border of the zone of the active wave effect on the seabed. Recently, scientific papers have tended to replace the term “coastal zone” with such terms as “top part of the shelf,” “coastal-shelf zone,” and others.

Coastline – where a sea or lake meets the land surface. At the same time, it is the border of a water body. Due to water level fluctuations even over short time-frames, C. becomes, to some extent, a conventional term that is usually applicable to denote some average many-year water level of a water body. Quite often in a coastal zone, ancient coastlines that had been established by development of various ancient forms of the coastal relief can be found. Their study provides materials for reconstructing the development of the coastal zone and the water body in general and also for making judgments concerning the nature and rate of vertical dislocations.

Cochak – a bay at the top of Mangyshlak Bay in Kazakhstan. The northern shore of the bay is low-lying, shallow, and flat. Along the southern coast stretches a mountain chain crossed in places by small ravines and an extensive valley positioned in between the Sarashva and Bulluktau Hills.

Colonizers (introduced species) of the Caspian Sea – new food items introduced in the marine fauna capable of surviving in the changing hydrological conditions of the Caspian Sea. Since the early 1930 s, it has been proposed to make provisions for the acclimatization in the Caspian of valuable food organisms of Mediterranean

origin. The choice of Mediterranean fauna as a source of replacement of the Caspian fodder resources was justified by the anticipated enhancement of Caspian salinity in view of the planned construction of hydraulic works on the rivers of the basin and use of the river waters for irrigation. The acclimatized species include both specifically imported and casual tramp species. The list of CCS:

- 50,000 B.C.E.: *Zostera nana*, *Cardium edule*, *Fabricia sabella*, *Atherina mochon pontica*, *Sygnatus nigrolineatus*, *Pomatoschistus caucasicus*, *Bowerbankia imbracata*;
- Early twentieth century: *Rhizolenia calcar-avis*, *Mytilaster lineatus*, *Leander squilla*, *L. adpersus*, *R. calcar-avis*, *Mugil auratus*, *M. sallies*, *Pleuronectes Flesus lus-cus*, *nereis diversicolor*, *Abra ovata*;
- Mid-twentieth century: (after the construction of the Volgo-Don Shipping Canal): *Pleopis polyphemoides*, *Balanus improvises*, *B. Ebumeus*, *Menmbranipora crustulenta*, *Ceramium diaphanum*, *C. Tenuissimum*, *Ectopocarpus confervoides*, *Polysiphonia variegata*, *Blackfordia virginica*, *Rhithropanopeus harrisi*;
- End of the twentieth century: *Penilla avirostris*, *Calanipeda aquaedulcis*, *Acartia clause*, *Mnemiopsis leidy* (not valuable), *Aurelia aurita*;
- Possible colonizers of the twenty-first century: *Pseuoevadne ter-gistina*

Commercial Fish of the Caspian Sea – about 40 species of fish of the Caspian and downstream reaches of rivers, though fishing of some of them is restricted and, in fact, only 25 fish species are of commercial significance:

- sturgeon (*Acipensendae*) – great sturgeon, Kura bastard sturgeon, starlet, Russian sturgeon, Kura sturgeon, North-Caspian stellate sturgeon, Kura stellate sturgeon;
- herring (*Clupeidae*) – Caspian ordinary sprat, anchovy sprat, big-eyed sprat, big-eyed shad, Agrakhan shad, Caspian shad, Sarinsky shad, Astrabad shad, Dolginsky herring, Agrakhan herring, Sarinsky herring, Pacific herring, big-eyed herring, Gasan-Kuli herring, Krasnovodsk herring, Astarabad herring, black-backed herring;
- salmon (*Salmonidae*) – Caspian salmon, white salmon, humpback salmon, dog salmon, silver salmon;
- pike (*Ecocidae*) – ordinary pike;
- catfish (*Siluridae*) – European catfish;
- pipefish (*Syngnathidae*) – Caspian pipefish;
- carp (*Cyponidae*) – North-Caspian roach, Kura roach, Black Sea roach, asp, Caspian asp, Caspian barbel, shemaya, eastern bream, white-eye, South Caspian white-eye, blue bream, Caspian vimba, sabrefish, common carp;
- mullet (*Mugilidae*) – golden mullet, gray mullet;
- aterina (*Atherinidae*) – Caspian aterina;
- perch (*Percidae*) – pike perch, Volga zander, sea zander;
- bullhead (*Gobiidae*) – marble goby, monkey goby, syrman goby, deep-water goby, Khvalyn goby, Caspian goby, stellate goby.

Commission for Integrated Study of the Caspian Sea – Caspian Commission – a special commission established at the USSR Academy of Sciences in 1934. Commission's head was N.M. Knipovich. Its terms of reference included multifarious study of special features of the Caspian Sea as well as unification of all operations carried out by the academic institutions dealing with the study of the Caspian and consulting other organizations on these matters.

Commission on Aquatic Bioresources of the Caspian Sea – established in 1992 at the meeting of fishery organizations of Azerbaijan, Kazakhstan, Turkmenistan, and Russia. The commission is an interdepartmental body, and its decisions are implemented on a strictly voluntary basis. Its terms of reference include formulation of a common policy of making use of bio-resources; examination of fishing regulations; distribution of scientifically-based quotas among the states, republics, and regions; and discussion of recommendations on improvement of the environmental conditions of the sea basin, on reproduction, and on conservation of bio-resources. In 2002, the K. admitted “Shilat”, Iran. Negotiations are being held to upgrade the Commission to the level of an intergovernmental organization and enlarge its powers.

Commonwealth of Independent States (CIS) – An interstate association formed by Belorussia, Russia, and Ukraine. In the Agreement on the establishment of CIS (signed on 08.12.1991 in Minsk), these states acknowledged that the USSR in the conditions of the grave crisis and collapse ceases to exist and declared their willingness to promote cooperation in political, economic, humanitarian, cultural, and other spheres. On 21.12.1991, Azerbaijan, Armenia, Kazakhstan, Kyrgyzstan, Moldavia, Tajikistan, Turkmenistan, and Uzbekistan acceded to the Agreement. Previously, these countries in association with Belorussia, Russia, and Ukraine, had signed the Alma-Ata Declaration on the goals and principles of CIS. Georgia acceded to CIS later and withdrew from CIS in 2008. In 1993, the CIS Charter was adopted, which determined the main spheres and lines of cooperation. The CIS operates through the following organs: Council of the Heads of States, Council of the Heads of Governments, Council of Foreign Ministers, Intertstate Economic Council, Interparliamentary Assembly with the Center in St. Petersburg, and other agencies. The CIS permanent body is the Coordinating-and-Advisory Board in Minsk.

Condominium (Lat. *con* – prefix meaning “together” and *dominium* – *ownership*, *co-ownership*) – in international law, simultaneous domination of two states over a single territory. Used by the Caspian states in determining legal status of the Caspian.

Consortium – provisional agreement among several banks or companies for joint activity in a particular sphere or region. The Caspian Pipeline Consortium (CPC) is a good example.

Continental Shelf – in international legal meaning suggests the seafloor including its subsoil stretching from the outer boundary of the territorial sea of a coastal state to the limits established by international law. Geologically, it means the subsea

continuation of the mainland (continent) seaward up to an abrupt precipice or transition to the continental slope.

“Contract of the Century” – the name given to the first oil contract signed on September 20, 1994 in Baku at the “Gulistan” Palace by Azerbaijan and an international consortium of the following oil companies: AMOCO, UNOCAL, and EXXON (USA); “British Petroleum” and “Ramco” (Britain); LUKOil (Russia) (withdrew from the Consortium in 2002, having sold its share to the Japanese INPEX); SOCAR (Azerbaijan); “Statoil” (Norway); “Itochu” (Japan); “Delta” (Saudi Arabia); “Turkish Petroleum” (Turkey); and “Pennzoil” (USA). It stipulates the development of 3 fields in the Caspian Sea: Chirag, Azeri, and Guneshli. Sometimes this contract is referred to as “Gulistan Contract” (after “Gulistan” Palace). The term of the Contract is 30 years. Estimated reserves are 511 million tons of oil. Azerbaijan’s profit (without inflation) is estimated at USD 34 bn, while the profit of the companies is estimated at USD 8 bn. On December 12, 1994, the Contract was ratified, and after the President of Azerbaijan signed it, it became Azerbaijani law.

Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) – drafted in 1973 in Washington DC, U.S.A., and Russia (as successor to the USSR) has been a Party to the Convention since 1976. In 1997, in Harare (Zimbabwe) at a Conference of the CITES signatories, sturgeons and sturgeon caviar, which are subject to strict control of the world community, were included in Appendix 2 of the Convention.

Convention on Wetlands of International Importance, Especially Waterfowl Habitat, Ramsar Convention – known as the Ramsar Convention, it was adopted on February 2, 1971 in Ramsar City, Iran and became effective in 1975.

Pursuant to the Convention, each contracting party shall determine suitable wetlands on their territory to be included in the list of wetlands of international importance.

Under the Convention, 4 areas of the Caspian seashore: the Volga delta, Kirova (Kyzylagach) Bay, Krasnovodsk Bay, and North-Cheleken Bay are recognized.

On December 3, 1982, the Protocol on Modification of the Convention was signed, and on May 28, 1997 amendments to the Convention were approved.

The USSR acceded to C. in 1975. After the collapse of the Soviet Union, only 3 officially-recognized wetlands were left, including the “Volga Delta” (Astrakhan Region), whose international status was confirmed by the RF Government. Besides, the government issued a decree whereby the list of wetlands of international importance was enlarged considerably. As of the beginning of 1999, the list included 35 wetlands of 10.7 million hectare total area. Experts’ estimates indicate that in Russia the total area of wetlands complying with the Ramsar criteria is likely to amount to hundreds thou of square kilometers. Every year, World Wetlands Day is celebrated on February 2. By 2001, 124 countries had joined the Convention. The Secretariat of the Convention is in Gland City, Switzerland.

Coordinating Committee on Hydrometeorology and Monitoring of Caspian Sea Pollution (CASPCOM) – established in 1994 with the backing of the WMO. The committee includes the heads of hydrometeorological services of the Caspian countries as well as representatives of international organizations and economic agents. One of CASPCOM’s priority objectives is the setting up of a single system of data base organization and management to make data available on the actual and forecasted state of and pollution of natural the environment of the Caspian Sea. CASPCOM’s sessions are held each year.

Coschagyl – township, Atyrau Region, Kazakhstan. Established in 1933, it is situated in the Circum-Caspian Lowland 147 km from the Railway Station Dosor. Its population is 50 thou people. One of the oil-producing centers in the Emba Oil area.

Count I.I.Vorontsov-Dashkov’s Wine Cellars – situated 21 km north of Derbent, 3 km away from the federal highway Makhachkala-Baku in Gejukh Village, Derbent Dist., Daghestan Republic. Built in 1855, after Imam Shamil was captured. Used to be owned by Count I.I. Vorontsov-Dashkov. The first wine products were delivered to St. Petersburg in 1905 (red wines “Cabernet”, “Mytsvani” and in small quantities – white wines – “Riesling”, “Sauvignon”, “Muskat”). At present, the area under vineyards is 460 ha. The amount of grapes harvested during a single season is 15,000 t. Four types of wine are produced: port wine, Cahors wine, “Rkatsiteli”, “Count Vorontsov”. The wine-cellars are designed to store 25,000 decaliters (250 t) of wine stock.

Crude Oil – any liquid mix of hydrocarbons encountered in a natural state under the surface of the ground, no matter whether or not it was subjected to treatment to make it suitable for transportation. The mix includes: C.O., from which some distillates could be removed; C.O., into which some distillates could be added; oil from a stratum (after removal of associated gas). It is often simply called “crude.”

Cutoff – (1) scouring through of a shore or sandy sea bar; (2) an arm connecting two channels of one river.

D

Daghestan, Daghestan Republic (from Turk *dag* – “mountain” and *stan* – “country” – “Country of mountains”) – part of the RF. Situated on the northeastern slope of the Greater Caucasus and in the southwest of the Circum-Caspian Lowland. D. area equals 50.3 thou km². This is the largest of all North Caucasus republics of RF. By area, it is larger than such countries as Albania, Belgium, the Netherlands, and Switzerland. In the east, D. has a shoreline with the Caspian Sea; in the south, it borders on the Azerbaijan Republic; and in the southwest with the Republic of Georgia. Its RF neighbors are the Chechen Republic in the west, the Stavropol Territory in the northwest, and the Kalmykia Republic in the north.

The Caspian shoreline is slightly-dissected and is 530 km long within the Republic, from the Kuma River mouth in the north to the Samur River mouth in the south. The extent of Daghestan territory from the north to the south is 420 km, while from the west to the east it is 216 km; its average elevation relative to mean sea level is 1,000 m; the highest point is Bazarduzu Mt. (4,466 m). Its lowest location (–26.0 m) is within the Terek-Kuma Lowland. The total length of D.’s land frontiers reaches 1,181 km. In the northeast of D., prominent are Agrakhan and Kizlar Bays; Agrakhan Peninsula; and Chechen, Tyulenii, and other islands. Russia’s southernmost point is in D. – Kurush Aul in the Dokuzparin Mountain District at an altitude of 3,500 m.

D.’s population is 2,740 thou people (2009), or 1.9% of the RF population. Of these, 58% live in rural areas. The population density is 54.4 persons/1 km². D. features exceptional diversity of nationalities, with 30 ethnic groups and 80 different nationalities live there. The most numerous peoples are: Avars – 29.4% of the population; Dargins – 16.5%, Kumyks – 14.2%, Lezgins – 13.1%, Lak people – 5.4%, Russians – 4.7%, Azerbaijanis – 4.3%, Tabasaran people – 4.3%, Chechens – 3.4%, Nogai people – 1.4%, and other people (Tatars, Aguls, Rutuls, etc.). D. is also home for such ethnic groups as Andian people, Didoi people, Bezhtin people, Akvakh people, Kubachin people, Tindian people, Chokh people, and others. High–mountain D. exhibits a particularly mosaic pattern of ethnic groups, including one–aul (Archi, Ginukhin) or two–aul (Botlikh, Godoberin) peoples. Most of D.’s population lives in compact settlements on separate administratively subdivided territories of the Republic. According to the first Soviet census of 1926, there were 28 native local languages and over 70 dialects spoken by several hundred to 3 thou people; 7 major

languages had their own writings. The Arabic alphabet that existed in D. at that time was replaced by the Latin alphabet in 1928, and in 1938 a new alphabet based on Russian Cyrillic was introduced. The Daghestan diaspora in the RF is 628 thousand people.

D. is subdivided into 41 administrative districts, with 10 major cities (thousand people in 2009): Makhachkala (466), Khasavyurt (135), Derbent (110), Kaspiisk (83), Buinaksk (61), Kizilyurt (60), Kizlar (51), Izberbash (51), Daghestanskie Ogni (26), Yuzhno-Sukhokumsk (11) and 14 semi-urban centers, including the capital, Makhachkala.

Nearly $\frac{3}{4}$ of the republic lies within the Greater Caucasus. As far as the arrangement of its surface system is concerned, D. is characterized by a vertical zonality subdivided into 4 major physiographic areas: Lowland, Piedmont, Intermontane, and High-mountain. The latter two are united under a general name, Mountainous D. Lowland D. is represented by the southwestern termination of the Circum-Caspian Lowland, most of which is below the ocean level and is comprised of the Terek-Kuma and Terek-Sulak Lowlands.

Piedmont D. (otherwise, Low-mountain) comprises separate ranges (from 150 to 700–1,200 m) of northwestern and southeastern extension, separated by wide valleys and depressions. Intermontane (otherwise, Mid-mountain) D. (altitude from 1,200–2,000 to 2,500 m) is known in geological literature as Limestone Daghestan because it is structured essentially by carbonaceous rocks. It is characterized by a combination of wide plateaux (Khunzakh, Gunib and others) and narrow ridges (ridges: Gimrin, Salatau, Les, Kara-Syrt and others) cut by deep valleys, gorges, and canyons.

High mountain D. comprises two main mountain chains: the Main (or Water-divide Ridge) of the Greater Caucasus (D. is on the northern slope) and the Side Ridge at absolute elevations from 2,500 to 3,000–4,000 m and higher.

The climate on the plains is dry and continental. In winter, there is little snow, and the summer is hot and dry. Mean temperature in January ranges from -5°C in the north to 1°C in the Circum-Caspian Lowland, while mean temperature in July is 25°C . The amount of precipitation is 200–400 mm/annum. In the piedmont area, the climate is more moderate and humid. Mean temperatures are: January -2.5°C , July 23°C . The amount of precipitation is 350–450 mm/annum. In the mountains, the climate is moderately cool. There are nearly 6,250 rivers in D., and the major ones are the Terek, Sulak, Samur along with their tributaries. Geographically, D. is in a semi-desert zone. There is a clear vertical tier pattern in the distribution of soil and plant cover in submontane areas and the mountains. The soils on the plains are light-chestnut, brown sandy loams, significantly salinized, meadow-solonchak soils, and in river flood plains alluvial. In submontane areas, chestnut and mountain forest soils are common. Vegetation is represented largely by sagebrush and saltworts as well as by sagebrush and ephemeral herbs. At heights of 500–1,600 m, broad-leaved forests (brown-hornbeam woods) are found, and higher are shrubs, mountain steppes, and grasslands. The woods and shrubs occupy 9% of D. territory.

As for wildlife, typical representatives of Asian steppes and of European fauna are found; there are also endemic species: East Caucasian tur, Caucasian snowcock,

Radde hamster, North-Caucasian weasel, and others. In the flood plain forests and flooded areas of the Terek and Sulak deltas, one still finds *Cervus elaphus*, as well as roe deers, jungle cat, and wild boar; birds found here are Caucasian pheasant, hazel grouse, Caucasian blackcock, and a lot of water fowl. Numerous lakes abound in fish (carp, bream, trout, pike, zander, and catfish). Until recently, the Caspian Sea featured an unusual abundance of fish resources (sturgeons, herring, bream, zander, roach and others). In the territory of the Republic is the Daghestan Nature reserve.

Oil, gas, and condensate constitute D.'s main wealth. For over 100 years, the oil and gas industry was the backbone of the country's economy. At present, $\frac{1}{4}$ of the fields (Izberbash, Yuzhno-Sukhokumsk, Achisu) have been depleted and recovery from these has stopped. Actual reserves of hydrocarbons in discovered fields amount to 30 million tons of oil and condensate and 100 bn m³ of gas. The forecast reserves on the Caspian seabed in the Daghestan segment are put at 340 million tons of oil with condensate and 540 bn m³ of gas. Besides, there are reserves of glass-making sand, building materials, combustible shales, coal, iron and complex ores, mineral springs. The basic industries are machine-building and metal treatment (separators, electrical equipment, instruments, machine tools, excavators, ship repair, and others), food and flavoring industries (grapes processing for large wineries: Makhachkala, Derbent, Kizlar, Buinaksk; a canned food industry; and a fish industry), chemical (glass fiber, varnishes, paints), oil and gas production, building material fabrication, Hydroelectric Power at the Chirkei dam (height: 230 m), Chirjurt, Gergebil, Miatlin, Irganai. Folk crafts are calking (Kubachi), carpet weaving, wood incrustation (Uncu-kul), a potter trade (Bolkhary), and others.

Around 40% of lands in D. are rangeland. Sheep raising, including transhumant grazing, plays the leading role here. Agriculture is irrigation-based. In rain-fed plantations, winter wheat and corn play the primary role. Irrigation is used for vegetable growing and fruit cultivation (apricots, sweet cherry, peaches, plums, and apples), and vineyards are significant.

Existing overland communications via short Primorsk Lowland (160 km) and exiting over a long distance to the Caspian Sea (530 km) enable close economic relations between the Republic and states of Transcaucasia, Central Asia, and Far Abroad. Through D. runs the main railway line Moscow-Baku, with the bypass line to Buinaksk and the off-lines of Makhachkala-Karlanjurt and Astrakhan-Gudermes. The major seaport Makhachkala is here, from which the ferry service Makhachkala-Anzali (Iran) operates.

In the second half of the first millennium B.C.E. emerged the first written records of the tribes that used to inhabit D.: Caspians, Albans, Legias, and others. From the mid-first millennium B.C.E. there began to take shape a union of East Caucasian tribes. The unifying agent was the tribe of Albans which subsequently established a vast state of Caucasian Albania, of which a considerable area of the contemporary D. was a constituent part. In the third century C.E., the Sassanids dynasty came to power in neighboring Persia. The Sassanids began successful campaigns of conquest, including those against Albania. In order to retain the ground here, they inculcated Zoroastrianism and built huge fortifications not only along the

circum-Caspian route (“Naryn-Kala” at Derbent, Great Caucasian Wall “Dagbary” – from Derbent to Tabasaran), but also in mountain passes. Eventually, the Sassanids attained their goal: in the fifth century, Albania fell and its territory was made part of Persia. New state unions on the debris of Albania were formed: Derbent, Lakz, Tabasaran, Sesir, Zirekhgiran, Kaitag, Gumik and others. These unions were the basis for molding the ethnic groups of D. In the mid-seventh century, there emerged a Khazar State in the steppes of the Northeast Caucasus, which included part of D.’s territory as far as Derbent. In 1556, Russia reached the Caspian Sea and 2 years later the first Daghestan envoys of the local ruler-shamkhal arrived in Moscow.

The people of D. sought to unite with Russia in order to get rid of the Iranian-Turkish oppressors. On September 12, 1723, a treaty under which D. became part of Russia was signed with Persia in Petersburg, but in 1735, the Circum-Caspian lands were regained by Persia again. Between 1734 and 1742, D. was all up in anti-Persian popular uprisings. In 1776, Tarkov shamkhalate took out the citizenship of the Russian Empire. Accession of D. and Azerbaijan to Russia was finally processed under the 1813 Gulistan Treaty with Persia; however, Turkey, unwilling to accept the loss of the Caucasus and D., gained support from Muridism, the most militant branch of Islam. The Caucasus war of 1817–1864 between Murids headed by Imam Shamil and backed by Turkey and Britain against Russia was waged under the slogan of *Gazavat* (i.e. “holy war”) against non-Muslims. As a result of the Caucasus war, D. became part of the Russian Empire. In 1860, the Dagestan Region was instituted and popular military management was introduced. People’s courts were established to look into the cases on the basis of Shariah and *adat* (customary laws). In 1877, D. was again up in new uprisings, but these were suppressed brutally. Throughout its history, D. had never been a unitary state entity; a multitude of states always existed on its territory. These were only united by force, following the annexation to the Russian Empire; at that time, for more convenient management, the tsar administration divided in 1884 the territory of Daghestani peoples’ settlement between the Daghestan and Tersky Regions, the Transcaucasian District, partly Baku and Elizavetinskaya gubernias (counties – provinces). In the late nineteenth to early twentieth centuries, small industries began to emerge in D. whose promotion was assisted by the construction of railways and the sea port. The February and October revolutions of 1917 and the following Civil War had crucial political and social impacts.

The inconsiderable in number proletariat and urban poor by the early twentieth century had been increasingly drawn in the revolutionary pro-socialist struggle. Conducive to this was that many mountain people had arrived in Baku and other industrial cities in search of better paid jobs, where they readily adopted the socialist revolution ideas. In the spring of 1918, the Red Guard moving from Baku and Red Army moving from Astrakhan captured Petrovsk-Port, while U. Buinaksky (Communist) and M. Dakhadaev (Socialist), who arrived together with the troops, organized a military-revolutionary committee and established the Soviet Power here. Late in 1918-early in 1919, D. was first occupied by the Turks together with the so-called Government of the Union of the Caucasian Mountain Peoples, then by the British. It was only on April 1, 1920 that D. regained its Soviet status. In

November of 1920, the First All-Daghestan Congress of D. Peoples proclaimed the Soviet Autonomous Republic, and on January 20, 1921 the Autonomous Soviet Socialist Republic (DASSR) emerged, succeeding the former tsarist Daghestan. Kумыk District of Tersky Region, later subdivided into Kazbek, Novo-Lak and Khasavyurt Districts, became part of the RSFSR. In 1922, the territory of D. stretched to the west of the former Tersk-Cossack lands of Stavropol Territory and Astrakhan Region, currently referred to as Kizlar, Tatumov and Nogai Districts. In 1923, the lands to the west of Kizlar District that used to belong to Greben Cossacks were merged to D. Nearly until 1927, districts, boroughs and precincts (the latter were abolished in 1925) existed in D. This done, the Daghestan Republic was subdivided into 26 districts and 2 subcantons. All of these were instituted on a nationality-and-territory principle, which did not break the unity of D. They were abolished when they began to be regarded as an obstacle to shaping up a “consolidated Daghestani people”. In 1928–1929, a different administrative division of D. was introduced: the 10 former districts gave way to 28 new ones. In 1938, all lands to the north of the Terek R. were returned to Astrakhan Region. In 1957, the lands on the left bank of the Terek R. were handed over to Chechnya. Since 1991, Daghestan has been a Republic, part of the South Federal District.



Daghestan Division of CaspNIRKh – deals with studying the state of the fish stock and forecasting the yield on the basis of existing environmental conditions on the Daghestan shore of the Caspian Sea; investigates the extent of marine pollution and its impact on the ecosystem; and determines the state of the food base for commercial fishes of the Daghestan shore and the dynamics of hydrochemical and hydrobiological state of the sea. Located in Makhachkala City, Daghestan. CaspNIRKh proper (Caspian Scientific Research Institute for Fisheries) is located in Astrakhan.

Daghestan Nature Reserve – multi-purpose reserve situated on the plain in the northeast of Daghestan. Est. in 1987 as a State Nature Reserve comprising 2 segments: Kizlar Bay (area 189 km²) and the Caspian Sea area, Sarikhum Barchan. Total area of the Reserve is around 20 thou ha, out of which flooded areas comprise 9,185 ha, sands comprise 376 ha, and rangelands comprise 200 ha. The reserve was established to conserve the natural state of Kizlar Bay, the Caspian Sea, and Sarikhum Barchan, including the animals and plants entered in the Red Data Book of Russia and Daghestan, both valuable hunted and commercial species. A second reason for its formation is to study and protect the crucial migration routes of birds, including their nesting and wintering places along the western shore of the Caspian Sea between Kyzylagach and the Astrakhan reserves. In order to protect the territory of the reserve against the adverse man-induced impacts, the land and water areas adjoining it are declared a protected (buffer) zone with a regulated (and controlled by the reserve) regime of human activity. The total area of the buffer zone equals 21,065 ha, out of which in the Kizlar Bay area are 19.89 thou ha and in the Sarikhum Barchan area are 1,175 thou ha.

Daghestanskie Ogni (“Daghestan Lights”) – a city in Daghestan 11 km north of Derbent and 118 km south of Makhachkala. Population is 26 thou people (2009). Established on the basis of the Mechanical Glass-Making Plant “Dagogni,” commissioned in 1926. At one point, regarded one of the USSR’s silicate industry giants. The plant is located at a point where combustible gases release (hence, the name of the plant and the settlement), there is recovery of local quartz sand, limestone, and Glauber’s salt (from Kara-Bogaz-Gol). Brick works, winery, and carpet making.

Daghestan Region – formed in 1846 as Derbent Gubernia (Province), from 1860 it has been the Daghestan Region (center – City of Derbent, from 1866 – Temir-Khan-Shura City). D. was under popular military management, the territory having been divided into 4 military divisions (Northern, Southern, Middle, and Upper Daghestan) that included boroughs and domains (khanates). As a result of the administrative reform of the 1860s, the khanates were abolished, and the territory of D. was divided into districts: Avarsky, Andiisky, Gunibsky, Darginsky, Kaitago-Tabasaransky, Kazikumukhsky, Kurinsky, Samursky, Temir-Khan-Shurinsky, which, in turn, were subdivided into naibates. DR’s land area in 1897 was 26.1 thou verst sq (1 versta = 1,067 km). Its population was 586.5 thou people, out of which only 19 thou people were urban dwellers.

The principal occupation was agriculture and animal husbandry (mainly, sheep-raising). 95% of the population was engaged in agriculture. The main crops were wheat, barley, rice, and corn. In the second half of the nineteenth century, Russian immigrant peasants began growing potatoes, tomatoes, beets, and other crops. Vine-growing and wine-making played a significant role (wine was exported to Moscow, Kazan, Rostov, and Nizhni Novgorod). The development of textile industry in Russia gave rise to madder cultivation (in mid-1860 s over 300 thou poods of madder was exported from Derbent (1 pood = 16 kg)), but when chemical dyes were invented, madder cultivation ceased. In the second half of the nineteenth century, there were over 300 cottage industries in DR (metal working, wood-working, currying, pottery, carpet-weaving, felt-making, felt-boot fabrication, needlework, and others). Industry of DR at the end of the nineteenth century was in the form of small manufacturing shops (wineries, canned-food plants, sulfur factories, tobacco, rope factories, and others), and extraction of minerals was insignificant (oil, sulfur, salt, and other minerals).

DR growth was accelerated after the construction in the 1890s of the Vladikavkaz Railway, which linked DR with the Center of Russia, Baku, and Grozny. Early in the twentieth century, the first specialized schools were established: an horticulture (1904, Derbent) and an electrical engineering secondary technical school (1905, Petrovsk-Port). By 1915, there were 93 Russian schools, Muslim madrassa and maktab schools were active along with mountain-Jewish schools at the synagogues, and 1,700 mosques. Newspapers were published: “Daghestan” (1906, Petrovsk-port), “Daghestan Bulletin” (1907, Derbent), and “Daghestan Regional Vedomosti (News)” (1909, Temir-Khan-Shura).

In July of 1914, a state of emergency security was declared in DR, and then martial law was imposed.

Daikhan Farm – a farm in Turkmenistan. The Law on “Daikhan Farm” has been passed.

Dailem Sea – see *Caspian Sea, Names*

Dakhistan – name of the southeastern shore of the Caspian Sea, named after one of the best-pronounced branches of population, referred to by Persian authors as *Sak-Tigrakhauts (Masagets)* and *Saks-Khaumavargs (Dokhs)*.

Damavand – mountain, 5,632 (5,604) m high. An extinct volcano, it is one of the highest mountain tops of the Elburz Mountain Range, Iran. Its cone-shaped summit has a cap of eternal snow. It serves a good reference point when navigating along the southern shore of the Caspian Sea.

Danilevsky Nikolai Yakovlevich (1822–1885) – philosopher, political writer, natural scientist. A hereditary nobleman. A graduate of Tsarskoselsky Lyceum (1842), he worked at the Office of the Military Ministry and concurrently was a lecturer of the Natural Science Department, Petersburg University (1843–1847). He studied botany, and in 1847 was conferred the degree of a Candidate of Science. In 1848–1849, he passed MS exams, and during the spring-summer of 1849, while getting

ready for defending a thesis, studied the flora of the European Russia's Black-Soil zone. From May of 1850, he worked at the Provincial Office in Vologda, and in 1852, he was transferred to work in Samara. Between 1853 and 1857, he participated in expeditions aimed at examining the state of fishing industries on the Volga and the Caspian Sea, led by K.M. Baer. In 1857, he was attached to the Department of Agriculture of the Ministry of State Property. In 1858, he was Chief of the Expedition intended to examine fishing in the White Sea and the Arctic Sea, and in 1861, he was a member of the Commission on Fishing Industry and Seal Hunting in Astrakhan. In 1862, he was appointed member of the scientific committee of the Ministry of State Property, and was posted to study the state of fishing on Pskovskoe and Chudskoe Lakes. Between 1863 and 1867, he was Chief of the Expedition to study the state of fishing on the Black and Azov Seas, and in 1868, he was posted to Astrakhan again. In 1869, he was a member of the Committee on Caspian Fishing Industry and Seal Hunting in Astrakhan, and in 1870–1871, he was the chief of the expedition to examine fisheries on Russia's northwestern lakes.

Materials collected by D. were published in a digest titled "Studies on the State of Fishing in Russia" (publ. by the Ministry of State Property) and were used as the basis for Russian legislation on fish farming. From 1872, D. was Chairman of the Commission for Developing Rules on the Use of Water Flow in the Crimea, and in 1879–1880 he was the Acting Director of Nikitsky Botanic Garden.

A most energetic scientist of the Russian Geographical Society, D. published in his "Bulletin" a number of works on climatology, geology, and ethnography of Russia. D.'s works in the field of natural science were theoretically based on his book, "Darwinism," in which D., while denying Darwin's theory of evolution, explained the origin of organisms by the activity of the supreme Mind.

Dargins (self-titled *dargan*) – a people in the RF (510 thou in 2002) and indigenous population of Daghestan (426 thou, including Katagai and Kubachi peoples). Also live in Stavropol Territory, Kalmykia. Language is Dargin of the Daghestan branch of Iberian-Caucasian languages. Dialects: Akushin, Tsudakhar, Urakhin, Sirkhin, Mekegin, Khaidak, Muerin, Gubden, Kadar, Kubachi, Cherag, Megeb. They are Sunni Muslims.

Day of the Caspian – the idea of introducing such a day was first voiced in 1999 at the conference "The Broadening of Partnership among the Public Organizations for Dealing with Environmental Problems of the Caspian" held in Azerbaijan. The purpose of this public holiday is to draw the attention of the public to ecological and socioeconomic problems of the Caspian, promote and maintain nature-conservation initiatives and traditions among the peoples of the Circum-Caspian states, and broaden the cooperation and interchange of experience among the region's environmental institutions. The annual DC has been celebrated since the year 2000 on the second Sunday of September.

Dead Kultuk, Bay – former name of Tsesarevich Bay, then Komsomolets Bay, which outlines the Buzachi Peninsula from the east on the Kazakhstan shore of the Northern Caspian. It was described for the first time by G.S. Karelin in 1832. The

bottom of the bay was an extensive, slightly concave sor-solonchak plain (when sea level was low and the bay was dry). It had distinctly outlined shores, which were drawn when the sea level was high. When the Caspian Sea level is high (since 1990s) and during wind surges, the water penetrates through the neck of the bay, producing water-logged marshes. Today, DK and its southernmost extension, Kaidak Bay, are now filled by the Caspian Sea water.

Dead Zone – name given to segments of the water area where, as a result of pollution, vital activity of organisms is impossible. On the Caspian Sea, two D.Z.s are Baku Bay (Azerbaijan) and Soimonov Bay (Kazakhstan). The emergence of such zones is due to protracted discharge of oil during its recovery, oil products wastes contaminating the water in the course of bunkering and transportation, and release of sewage and sewerage waters.

Debarcader – (Fr *debarquer* – “unload on the shore”) floating landing stage (rack-mounted motorless boat) designed for mooring and servicing passenger and freight ships. Erected at stations of insignificant passenger and cargo turnover. Passenger D. have relaxation rooms, refreshment rooms, medical stations, and other rooms to accommodate passengers. Freight D. are equipped with machines for cargo transshipment, and they also have store-rooms for short-term storage of cargo.

Declaration Between the Russian Federation and Kazakhstan Republic on Cooperation in the Caspian Sea – signed by President of the RF V. Putin and President of Kazakhstan N. Nazarbaev on October 9, 2000 in Astana, Kazakhstan. The parties “confirmed that they are convinced that it is expedient that the consensus decision regarding the new legal status of the Caspian Sea should be based on a compromise proposal to delineate the seabed between contiguous and alternate states along the median line, modified as agreed between the parties with a view to exercising their sovereign rights to using the subsoil, while leaving the water space for common use, providing for freedom of navigation and agreed to standards of fishing and environmental protection. At the same time, the use of the fields through which the agreed dividing line will pass may be subject to separate arrangements between the respective Circum-Caspian countries.” The parties, realizing that “the attainment of a pentilateral consensus on the new legal status of the Caspian Sea will call for additional efforts and time and in view of the aggravating environmental situation in the Caspian Sea, critical state of its unique sturgeon population, have urged the other Circum-Caspian states to conclude, as a matter of priority, prior to signing the Convention on the legal status of the Caspian Sea, multilateral intergovernmental agreements, whereby it will be possible to take urgent collective measures toward protection of the Caspian Sea’s natural environment, conservation, renewal, and rational use of its biological resources.” Furthermore, “the parties spoke in favor of establishing on a permanent basis of a pentilateral Strategic Caspian center to monitor the state of natural environment of the Caspian Sea.”

Deepwater Bullhead (*Neogobius bathybius*) – fish up to 25 cm long. Its weight is 165 g. It reaches maturity at the age of 2 years. It lives mostly in the Middle and Southern Caspian. The lifespan of male species is 4 years.

Deflation – destruction and blowing over of rocks and soils impacted by the wind.

Deilem Sea – see *Caspian Sea, Names*

“Delo” (“Cause”) – the first Russian steamship. Built in 1908 at the Kolomensk Works as a tanker for navigation in the Caspian Sea. Displacement was 6,000 t, and tonnage was around 5,000 t, with a speed up to 9.5 knots. It was equipped with a shipboard-type diesel power plant. In 1937, it was renamed “Valery Chkalov” in honor of the famous Soviet aircraft pilot.

“Delovoi Kaspii”, International Council “Business Caspian”, ICBC – International Council for the Cooperation of Trade-and-Industry Chambers of the Circum-Caspian Countries. Established September 20, 1996 in Astrakhan. Council goals – consideration of current and prospective issues of multilateral cooperation, development and implementation of specific programs and measures, promoting direct contacts among enterprises and organizations of the Circum-Caspian countries. The council is made up of committees for: transport and logistics, economic security, information. The Council meets once a year.

Delta – the most common type the mouth area of a river as it flows into the sea, characterized by a large number of arms, gradually bifurcating on either side of the main channel, intertwining and forming a multitude of islands.

Department for Kalmykian Affairs – central state institution in charge of negotiations with Kalmyk Taishes (governors of uluses – tribal associations) regarding extension of Russian citizenship to them (1661).

Department for Navigation Security on the Caspian Sea (UBEKOKASP) – In 1918, an order for the marine fleet and the Naval Department was issued that enacted the Regulations on the Departments for Navigation Security (UBEKO). These Regulations outlined procedures for operation of hydrographic services in the Navy. In the fall of 1919, in connection with the unfolding military actions in the Caspian Sea and on demand of the Commander of the Volga-Caspian Navy, the formation of UBEKOKASP was started with its deployment in Astrakhan, a process that was completed in 1920 in Baku. In 1920, UBEKOKASP comprised: transport vessel “Araks”; lightships “Sredne-Zhemchuzhny,” “Krasnovodsky,” “Shakhova kosa,” “Zapadny,” and “Ashuradessky”; onshore lighthouses, such as Verkhny Tyub-Karagansky, Kuulinsky, Zhiloy, Svinoy, Chechensky, Apsheronky, Amburansky, Shoulansky, Derbentsky, Nargensky, Petrovsky, Lenkoransky, Sarinsky, Astarinsky, Bekovicha, and Nizhny Tyub-Karagansky; and navigation lights at such points as Plita, Lebyazhiy Kamen, and Kurinskaya Kosa.

On July 9, 1920, pursuant to the order of the Commander of the Volga-Caspian Navy, UBEKOKASP was re-subordinated to the Navy Headquarters with deployment in Baku. This date should be considered the birthday of the Hydrographic Service within the Caspian Navy.

In 1921, UBEKOKASP comprised the following divisions: Hydrographic and Sailing Directions Directorate, Lighthouse-Engineering Directorate, Hydro-meteorological Division, First Southern Hydrographic Team and Sailing Directions Stations in Baku, Krasnovodsk, and Astrakhan-Petrovsk (northern).

Department of Caspian Fishery and Seal Hunting (1856–1904) – established in Astrakhan as a state authority at the Ministry of the State Property of the Russian Empire for supervising the compliance with the Regulations on the Caspian Fishery and Seal Hunting and the fishing and collection of state duties.

Department of the Caspian-Volga Fishery and Seal Hunting (1904–1917) – established in Astrakhan as a state authority first at the Ministry of the State Property and later at the Ministry of Farming and State Property, Chief Department for Land Management and Farming of the Russian Empire. It had a function similar to those of the Department of the Caspian Fishery and Seal Hunting and also for supervising the compliance with the Regulations on the Caspian-Volga Fishery and Seal Hunting.

Derbent – center of Derbent District, Daghestan, and third largest city after Makhachkala, it is the southernmost, most ancient, and most multinational city of the RF (over 60 nationalities and ethnic groups). It is situated 121 km south of Makhachkala on the shore of the Caspian Sea in the offshoots of the Tabasaran Mountains of the Greater Caucasus. The territory of D. closes the narrow coastal strip known as the Derbent Gate, of the Caspian Gate. The city territory (70 km²) and adjoining areas in the east are limited by the Caspian seashore in the west and southwest, by the precipices of the Sabnov and Jalagan Highlands and their continuations in the Sar-Dogdar Range in the south, and by the slopes of the same highlands in the north. Population – 110 thou people (2009).

The history of the city is lost in the fog of time. Numerous ancient sources, while narrating about this famous Caucasian city, fail to provide any specific data as to when it was founded. Analysis of indirect data of ancient sources, local chronicles, folk legends and tales, and archeological finds have enabled researchers to conclude that human settlements in this area existed as far back as at the dawn of the Bronze Age, in the late 4th – early 3rd millennium B.C.E. People used to settle here not only because the geographical position of the place was very convenient, but also because it was extremely lucrative strategically. Additionally, climatic conditions were favorable. Records of the city were left by famous ancient historians, geographers, and travelers: Hekatei of Miletus, Haris Metilensky, Herodot, Strabon, Cornelius Tacitus, Plinius Secundus, Ptolomeus, Joseph Flavius, Aelius Aristides, Cassius Dionis and others. Its name is mentioned on more than one occasion in the communications of such authoritative medieval authors as Ibn Khordadbekh, Masudi, El-Garnathi, Al-Istakhri, Al-Muqaddasi, and many others. In numerous

sources, D. is mentioned under different names. In Ptolomeus's maps (Second century B.C.E.) the city of Gelda (Jelda) is indicated in the area in question.

The Byzantian sources refer to it as the Tzor (Tzur, Tsur) fortification, Albanian Gate, Choga Gate, and Great City of Choga; the Syrians, as the Caspian Gate, Toraye Gate; Arab – Bab Al-Abwab (Main Gate, Gate of the Gates), Bab Al-Khadid (Albanian Gate), Sed Alban (Albanian Walls), and sometimes, simply Al-Bab (gate); the Turkish authors refer to it as Temir Kapysy or Temir Kapy (Iron Gate); the Georgians, as Dagvis Kari (Sea Gate), Daru-Band; the Armenians, as Jora, Jora Gate, Pakhak (Guard), Pakhak Walls, Border Fortress Chora, Gunn Gate, Zuar Gate, Hon Gate, Hon Fortress; and the Russians, as Iron Gate and Derben'. The city is mentioned in the historic chronicles and folklore of the local peoples under the name of Chulli (Darg.) or Churul (Lag.). Besides, in some sources the city is referred to as as-Sul, Tamur-Kagolga, Chor Pass, Great Stronghold, Jol, Sed Yadjuffi-Madjudj, Chor Fortress, Chor Gate City, Northern Gate, Derbent Gate, etc.

The economic and political significance of the city was the subject of special attention paid to it by such mighty powers as the Roman and Parthian Empires, Midia, the Kingdom of the Hunns, Greece, Iran of the Sassanids, the Arab Caliphates, Byzantium, and Khazar Kaganate. In the middle ages, the city was claimed by the State of Sefevids and the Seljuq State, the Golden Horde and Sultanate Turkey, the State of Timurides, and others. The major commanders of the Arab Caliphate Maslam and Mervan used to lead their warriors to storm the ancient walls of Derbent, as did the fellow-fighters of Gheng-Khan; Suburdai-Bakhadur; and Jebe-Noyon; the stern conqueror Timurleng (Tamerlan); the famous ruler of the Golden Horde Tokhtamysh; the founder of the State of Sefevids, Shah Ismail; and "the terror of the Universe," Nadir-Shah.

The existing name of D. (Darband) is encountered in written sources as from the seventh century and, when translated from Persian, means "Locked gate" (Pers. *Dar-band* – "gate node", *der* – "door" and *bent* – "lock, obstruction". D. was established by order of the Tzar Yezdigerd II of the Sassanids Dynasty (ruled during 435–457 years) as a fortified city on the northern border of the Persian possessions with a view to protecting these from the incursions of northern nomads (Hunns and Khazars). Initially, Derbent was surrounded with mud-walls. In the year 567, during the rule of the Sassanid tzar Khosrov I Anushirvan (531–579), they began to build protective walls of stone, part of which that strung from the north to the south still serving as the city limit. The construction work was completed in phases: at first, the citadel and northern city wall were erected; this was followed by the construction of the southern wall (both the walls were arranged parallel to each other. In the west, they joined at the citadel, and in the east they ended in the sea at a considerable distance from the shore, forming a harbor). Later, the Mountain wall was built ("Dag bary," west of the citadel, which was more than 40 km long). This was a complex system of fortifications designed to prevent possible evasive actions around the fortress using mountain valleys and passes.

In the sixth century, the first transverse wall was set up, separating the inhabited part of D. near the citadel from the desolate maritime part. The ancient city was enclosed in a space limited in the west by the Naryn-Kala citadel and in the east by

the sea; the settled city area was around 150 ha. A comparison of this with the area of the famous medieval cities of Central Asia, the Middle East, and Europe indicates that D. was larger than any of them: Samarkand (65 ha), Bukhara (35 ha), Termez (20 ha), Damascus (105 ha), Jerusalem (100 ha), Khaleb (112 ha), Piza (114 ha), Ghent (80 ha), Brugge (80 ha). During the sixth to seventh centuries, D. was not only an important base station for struggling against the nomads, but a large cultural center in the Caucasus. Nesewi the historian wrote that D. was so unassailable that it was generally believed absolutely impossible to capture by force; it could only be seized through treason.

In the 630s, when the Sassanid Persia was weakened by the war with Byzanty, D. was seized by Khazars. In 652, Arabs reached the city walls. After D. became part of the Arab Caliphate, mosques were increasingly built in the city (including the Jami-Mosque), and most city dwellers became neophytes of Islam. In the eighth century, under the commander Maslam ben Abd-al-Melik, D. became a major military-and-political center in the Caucasus and included the residence of the Caliphate exarch. From the eighth to tenth centuries, D. was the center of marine trade and the main port on the Caspian Sea. In the tenth century, following the collapse of the Arab Caliphate, D. became the center of an independent emirate. In 1071, the city was seized by Turks – Seljuqs. In the thirteenth century (1239), D. was conquered by the Mongols and saw a period of decline. The towers and pinions of the fortress walls were destroyed. In the sixteenth to early eighteenth centuries, D. becomes part of Persia, and early in the seventeenth century, the Sefevid ruler Shah Abbas did his best to restore and fortify the port, making the city a stronghold of the Sefevids in the East and North Caucasus. Russian made their first incursion on Derbent, led by Stepan Razin in 1668. In 1722, D. was annexed to Russia as a result of Peter I's Persian campaign. In 1735, under the Gandzha Treaty, D. was again annexed by Persia. From 1743, D. was the center of Derbent Khanate, residence of Nadir-Shah. In 1796, D. was captured by Russian troops, and in 1813, under the Gulistan Peace Treaty, D. was finally annexed to Russia. From 1840, D. was a district before becoming a provincial city in 1846.

After 1840, D. underwent booming economic growth associated with, among other things, the development of the cultivation of madder, a plant from which they used to obtain a cheap dye for carpet-weaving industry. A monument was even erected to D. inhabitant Kerbalai Guseinov, who revived madder cultivation early in the nineteenth century, in Avignon, France. That monument stands side by side with a monument to Alten, a pioneer of madder growing in France. Besides madder and poppy growing and processing, the dwellers of D. in the nineteenth century were also engaged in horticulture, grape-growing, and fishing. In 1898, a railway was laid through D. linking Petrovsk-Port (currently, Makhachkala) with Baku.

The legendary city with the mysterious history and famous architectural monuments inspired poets and writers. It was mentioned in the works of the great oriental poets Nizami Gandzevi, Saadi, Shirazi, Mujir Bailakani, Abdul-Kasim Firdousi and others.

Exceptional interest in D. brought celebrated travelers, including the Arab scholar and pilgrim Al-Masudi (tenth century), the caliph's envoys Al-Vasik Billah

and Saddamaat-Tarjuman (845), the famous Venetian traveler Marco Polo (1295), special envoy of the French King Louis IX Guillome de Rubruk to the Mongol Khan Mang (1225), the Russian merchant Afanasy Nikitin (1638), the Venetian diplomat Ambrosio Contarini (1474), the Moscow merchant Fedot Kotov (1623), and many others. This is how Fedot Afanasyevich Kotov described D.: “And the city of Derbent is made of white stone, it used to be strong, albeit sparsely populated. One end of the city stands in the mountains and the other one juts out into the sea. It stretches into the mountains by more than 3 verst, while cross-wise the city is partitioned off in 2 places making up 3 cities; they also say that nearly 30 towers have been claimed by the sea, and now the tower that has been submerged has become great and strong.”

The names of famous figures are associated with D.: the Decembrist-writer A.A.Bestuzhev-Marlinsky (was reduced to the ranks and served here in 1830–1834), the Surgeon N.I.Pirogov, the French writer Dumas, Sr. (he narrated his impressions of D. in travel notes “The Caucasus from Prometheus to Shamil”).

D. is a crucial transport nodal point: a sea-port, a railway station on the Makhachkala-Baku line. It is also the Rostov-on-Don–Baku highway.

Industrial enterprises include a grinding machines manufacturing plant, “Elektrosignal”.

D. is an ancient carpet-weaving center and has a canning factory (canned fruits, vegetables, fish, and meat). D. is a well-known center of making top-grade grape wines. A brandy distillery and food industry enterprises, a plant for the fabrication of building materials, and a carpet-weaving training center are also located here. The S. Stalsky Lezgin drama theater has performances, and a history and architecture and fine arts museum reserve also function here. Near the museum are museums for archeology, culture, and way of life of ancient D.; for carpet-weaving and Daghestani folk handicrafts; and for ethnography and way of life of the circum-Caspian peoples. D. is a major educational center of Daghestan. It has 18 branches of Russian Federation’s institutions of higher education. D. is also a major tourist center.

At Naryn-Kala citadel are the remains of palace complexes dating to different periods: near the eastern wall to Albanian time (classical), Sassanid, and Arab time (Sassanids Palace of the sixth to seventh centuries); the northwestern part is pre-Mongolian period in the lower part, while the upper part is from the fourteenth to seventeenth centuries. One can still see the ruins of Derbent Khan’s palace structures (second half of the eighteenth century), an underground structure “Stone Bag” (cellar or prison for Khan’s captives, water cisterns, the bath-houses (built in the seventeenth century), guardroom (1828), fortress walls of D. with towers and the gates, including the Kyrkklar-Kapy Gate in the northern wall (sixth to thirteenth centuries) and the Orta-Kapy in the lower wall (initially thought to date back to the sixth century.) All of these structures were frequently remodeled. In the upper, old part of D., adjoining the citadel is a typically Muslim medieval city with a network of narrow, crooked streets walled by the blind facades of 1–2 storeyed buildings with mosques, water fountains, and bath-houses. This part of the city features: the Juma-Mosque complex (eighth century), madrasah (fifteenth to nineteenth centuries), and

three arch-type gates (seventeenth to nineteenth centuries). The Kyrkklar-Mosque (seventeenth century), the Minaret-Mosque (eighteenth century, partly remodeled in the nineteenth century), with the only half-ruined minaret (fourteenth century), and Chertebe-Mosque (eighteenth to nineteenth centuries). Near Kyrkklar Cemetery (part of the D. northern cemetery) is the former Khan's Mausoleum (1787–1788) and bath-houses buried nearly 2/3 into the ground with arches and domes (seventeenth to eighteenth centuries); underground cisterns (seventeenth to eighteenth centuries); remains of the caravanserai (seventeenth to eighteenth centuries). In the lower, new part, which is regularly planned, there still exist buildings dating to the nineteenth to early twentieth centuries, a railway terminal (end of the nineteenth century), the passage covered market, and an Armenian temple (eighteenth century).

In 2002, the Bank of Russia minted a Rbls. 10 coin displaying D. in the series "Russia's ancient cities."

Derbent County – formed in 1846 in part of the territory of the Caspian Region. Its center is Derbent. In 1860, the country was abolished, the territory becoming part of the Dagestan Region.

Derbent Defense Complex, Derbent Fortress – located on the eastern outskirts of Derbent City, on the Makhachkala-Baku highway. According to experts, as early as ancient times (seventh to sixth centuries B.C.E.) there existed a well-fortified settlement here. Archeological excavations confirmed these hypotheses. The first settlers chose Derbent Hill (340 m above mean sea level) as a site for their future residence, the current location of Naryn-Kala citadel. This ancient settlement, protected in the south, west, and north by deep canyons and inaccessible steep rocks of the Jalgan Ridge, had its eastern side overlooking the pass protected by a 5 m wide bulk crushed stone. Towering over the pass, this base station was in a position not only to control the narrow coastal strip, but to withstand a rather powerful assault of steppe people's striking force, the cavalry. This ancient settlement was rather large and was 14–15 ha in area (the area of the famous Troy was 10 ha, maximum); however, despite its defense power, the settlement was not inaccessible to the persistent waves of steppe people who traveled along the Circum-Caspian route to the Transcaucasia and Asia Minor. The peculiarity of the pass' geographical position and its strategic importance necessitated permanent improvement of the fortifications, adapting it to the requirements of the increasingly elaborate military strategy and tactics. This explains why it took centuries to establish DDC and enlarge its size, making use of the achievements of military engineering and construction. DDC is most grandiose and striking in terms of scale and its monumentality in the system of Sassanid fortifications on the western shore of the Caspian Sea. The complex comprises two parallel thick stone walls, each more than 3.5 km long, from the top of Derbent Hill to the sea. The distance between the walls at the sea is 450 m, at the hill top, where these culminate in the Naryn-Kala citadel, at 350 m. At present, the walls do not reach the sea, but according to numerous records left by medieval authors, the walls used to stretch far into the sea. From the southwestern corner of Naryn-Kala citadel up in the mountains, strictly following the relief of the Jalgan Ridge, one other thick

stone wall, known as Mountain Wall, also exists. Today, its remains are traced for a distance of over 40 km along a straight line. The thickness of the walls made of large blocks of locally available shell reach 4 m, their height still being 10–18 m. Two rows of stone slabs form the outer wall and the space in between them is filled with rubblework on limestone mortar. The outer facing blocks (the size of the blocks is standard and averages 1 m in length, 0.7–0.8 m in width, and 0.25–0.3 m in thickness) are very well fitted to one another and are laid without mortar. Not only do they look festive and monumental, but they appear unshakeable and inaccessible.

DDC preserved to this day is by far superior to all other “long walls” set up by the Sassanids in the Caucasus in terms of thickness and grandiosity and may be regarded as the masterpiece of the Sassanid art of fortification. The numerous data of written sources and one of the 28 still existing Pahlavi inscriptions on the outer side of the northern wall and on Naryn-Kala citadel indicate that DDC construction involved 4 million cubic meter of stone masonry at the time of rule of Khosrov I Anushirvan (531–579), one of the most outstanding Sassanid Tzars of Iran; however, numerous ancient sources and archeological data indicate that the thick stone walls of DDC were erected on the foundations of walls that had been made of raw brick earlier. The construction of the walls is attributed to the father of Khosrov I Anushirvan Cobad-Shah (488–531), Grandfather Firuz (457–488), and even to Great Grandfather Iezdigerd II (438–457).

DDC may arbitrarily be divided into Naryn-Kala citadel, city walls, and Dag-Bary (Mountain Wall). Each of these component parts was capable of functioning independently; at the same time, they are parts of one defense system, whose nucleus was Naryn-Kala citadel. This is a unique example of an organic combination of a frontier wall, a powerful citadel, a city, and a port.

Derbent Hollow – a deep-water stand-alone hollow in the Middle Caspian, stretching from the northwest to the southeast. DD is separated from the deeper southern part of the sea by the subsea ridge (Apsheron Sill) crossing the sea along the line from the Apsheron Peninsula to the Kuuli Cape. This ridge is the continuation of the Greater Caucasus Mountain Range. The DD mainland slope is narrow and steep. Maximum depth of DD is 788 m, running parallel to Khudat Village in the western half of the sea.

Derbent Khanate – feudal state on the western shore of the Caspian Sea in South Daghestan established in 1747, following the death of the Persian Nadir-Shah and the collapse of his state. In 1806, it was annexed to Russia. Under the Gulistan Peace Treaty of 1813, Persia recognized Russia’s power over the former DKh.

Derbent Plain – see *Lower Samur Plain*

Derbent Sea – the name of the Caspian Sea stemming from the name of Derbent Port. See *Caspian Sea, names*.

Derbent Wall – see *Caspian Gate*

Dervish – peninsula, western shore of Turkmen Bay, Turkmenistan. Juts out into the sea from the tip of Cheleken Peninsula, 16 km to the south. Its narrow, sandy terminus is called South Cheleken Spit. As the Caspian Sea level drops, the spit stretches southward, and when the sea level rises, the spit becomes submerged. The eastern tip of the peninsula is Alaja Cape.

Desertification – a complex process of degradation occurring in arid ecosystems as a result of natural exodynamic processes and irrational human activity resulting in aridization of plant and soil cover and reduction of bioproductivity short of full destruction resulting in an area turning to desert. According to the definition elaborated at the United Nations Desertification Conference (1977), “desertification is long-term decline of biological productivity of an area.” The explanatory Note to the FAO/UNESCO/WMO map of desertification (1977) says that “desertification is a process leading to a reduction of biological productivity with subsequent diminution of plant biomass in respect of potential capacity of a given area for livestock, crop harvesting, and material well-being of the people.” In 1990, the D. concept was reconsidered, and the following definition was adopted: “Desertification is degradation of lands in arid, semi-arid, and dry and sub-humid areas, mainly as a result of the adverse impact of human activity.” Under this definition, land includes soils and local water resources and relief as well as plant cover or cropland. Degradation suggests diminution of the resource potential by one or several processes combined impacting the land: water erosion, deflation, and sedimentation produced by these processes. In some cases, long-term reduction of the volume or diversity of natural vegetation as well as salinization or solonetzification of soils is observed. The text of the United Nations Convention on Combating Desertification in the countries subjected to severe drought and/or desertification, especially in Africa (1994), D. is defined as “degradation of lands in arid, semi-arid, and dry sub-humid areas as a result of various factors, including climate change and human activity.” In Russia, D. processes affect around 100 million hectare (46.8%) of cropland. Hazardous and potentially-hazardous areas from the standpoint of D. are the territories around the Caspian Sea: Astrakhan Region, Republic of Kalmykia, Daghestan Republic. The situation is particularly disastrous in the Republic of Kalmykia, where a human-induced desert of an area of 1 million hectare has formed over the last 70 years. In order to combat D., the following plans have been drawn up: Master Scheme of Combating Desertification of Black Lands and Kizlar Ranges (1986); Action Program to Combat Desertification in the Republic of Kalmykia (1994–1995); and Sub-Regional Program of Action to Combat Desertification for the Southeast of European Russia (includes Astrakhan Region and Daghestan Republic) (1999).

Dike – hydrotechnical structure in the form of banked earth arranged in the channels and flood plains of the rivers, on the shores of seas and storage reservoirs for the purpose of flood protection and changing the direction of the water flow.

Divichi, Devichi – city (from 1961), district center, Azerbaijan. Located in Samur-Divichi Lowland. Contains a railway station and a carpet-weaving factory.

Divide – boundary of basins running over the highest points of relief, from which runoff is directed to either side.

Division of the Seabed – determining or establishing the general direction of division of the seabed among the states for them to be able to exercise their jurisdiction over the respective seabed areas, including the subsoil and deposits of mineral raw materials there.

In 1998, the Russian Federation and Republic of Kazakhstan signed the Agreement on Delimiting the Seabed in the Northern Part of the Caspian Sea for Exercising Their Sovereign Rights to the Use of Subsoil. In 2000, the RF and Kazakhstan Presidents signed the “Declaration on Cooperation in the Caspian Sea,” and in 2001, the Joint Statement of the Russian Federation and Azerbaijan Republic on Principles of Cooperation in the Caspian Sea was released. That same year, the Agreement on dividing the Caspian Seabed between the Republic of Kazakhstan and Azerbaijan Republic was signed. In September of 2002, the Agreement on Delimiting the Contiguous Areas of the Caspian Seabed between the Russian Federation and Azerbaijan Republic was signed. In May of 2002, the Protocol to the 1988 Bilateral Agreement between the Russian Federation and Republic of Kazakhstan on delimiting the Caspian Seabed in the Northern Part of the Sea for Exercising Sovereign Rights to the Use of Subsoil was signed.

Dolgi – a peninsula that juts out on the eastern shore of Mangyshlak Bay, Kazakhstan.

Dolginskaya Herring (*Alosa brashnikovi brashnikovi*) – large predatory fish feeding on small fry (Caspian kilka, gobies, etc.) and small crustaceans. Lives up to 7–8 years and reaches 49 cm in length. Average weight is 250 g. Becomes sexually-mature at the age of 3–4 years and spawns up to 4 times a year. Winters in the Middle and Southern Caspian. In spring, migrates to the Northern Caspian. DH’s spawning grounds are in the eastern part of the Northern Caspian from Sarytash Bay to Circum-Ural waters, largely at a depth of 1–3 m with salinity between 8 and 13‰. Spawning lasts from late April to mid-May at water temperature from 14 to 18°C. DH is one of the most cryophilous Caspian herrings. Its fat content equals 5–8%, dropping to 2.6% at spawning grounds. Young herrings and those that finish spawning head for the south. DH is a valuable commercial fish.

Dorn (Berngard) Boris Andreevich (1805–1881) – academician of Petersburg Academy of Sciences and Director of the Asian Museum (1842–1881), a scientific research institution for stocking and studying the cultural monuments of the East (in 1930, the Institute of Oriental Studies of the USSR Academy of Sciences was founded on its basis) and Russia’s main ethno-archeological museum in the nineteenth century. D had command of many oriental languages, both ancient and contemporary, studied written monuments, ethnographics, examined the results of archeological expeditions. He prepared a guide on the Asian Museum (1864). Wrote a 4-volume History of the Circum-Caspian Area, a study on the advent of Islam on the shores of the Caspian Sea (in 1850–1858) that was never translated into Russian.

One of the pioneers of studying written monuments associated with the history of Khazaria.

Dossor – township in Atyrau Region, Kazakhstan that has a railway station and is located in the Circum-Caspian Lowland. Its population is 15 thou. One of the first centers of oil recovery in the Emba oil area, where oil was discovered in 1911. Official records of that time read: “The oil jet at D. rose 25 m, and the fountain lasted for 30 h, the yield of oil recording 16.7 t. The second oil field Makat was discovered 30 km from D. in 1915. Also contains repair plants.

Downstream – one of three segments of power-generation business dealing with processing and wholesale and retail trade of end products. In the oil-and-gas sector, includes oil refineries and petrochemical plants as well as the network of filling stations, storage areas, etc.

Downstream Migrant Fish – fish after spawn running downstream into the sea.

Drainage (from Eng. *drain* – “remove water”) – lowering down the ground water table by building ditches (open D.) or buried ditches with pipes and porous materials inside them (closed D.). Used for draining bogs, aeration of heavy soils, preventing landslides, protecting foundations, etc. To combat salinity, a drainage-and-collector system is built in an irrigated area. Developed particularly in Circum-Caspian territories of Azerbaijan.

Drainless Lakes – lakes having no natural outflow that lose water by evaporation and underground seepage. They may or may not have surface inflow. D.L. are very diverse by their origin. Their number is greatest in drainless areas of the steppe and semidesert zones. Under arid and semiarid conditions they are usually highly saline. Notable D.L. are the Caspian Sea, Aral Sea, Balkhash Lake, Lobnor Lake (China), Dead Sea (Israel), Great Salt Lake and Mono Lake (USA), and Chad Lake (Africa), to mention but a few.

Dredging – one of the main and most common types of work on navigable rivers, sea channels, and in ports to excavate the bottom of the water course or water body where the depths do not permit navigation, removing the excavated ground from the shipping lane. Dredging is carried out by means of dredgers. They distinguish between transit D. performed to maintain the lane’s overall dimensions on rivers and canals over which transit navigation of ships is carried out and other-than-transit D., which facilitates the approach of ships to particular locations, like ship-repair yards, and broadens the water areas of broadlands for the purpose of removal of dredged ground when setting up dikes and for other purposes. D. is underway on the Volga-Caspian Canal all the time.

Dredging Slot – a cut in the seabed, bottom of a river, lake or canal made by dredging. DS, when dredging is performed on the rivers, is, for the most part, made in shallow segments, and on the seas they are made when sea channels are built or port water areas are deepened. DS are arranged or laid out in compliance with the

requirements of navigation (making the lane convenient in terms of its direction and required overall dimensions). At the same time, correct layout is very important as it helps to avoid drifting up with soil because DS produces new hydraulic conditions, affecting the redistribution of directions and variability of streamflow velocity values. Examples are the Volga-Caspian Canal and the Lagan Shoalbank Canal.

Drift Fishing – fishing from trawlers furnished with drift nets that retain fish caught in them.

Drift Net – (1) one-sided net for catching fish moving downstream. Several such nets are connected to form a floating (drifting) net line. (2) Double-sided net for fishing in a river (during fishing it is lowered down the stream).

Drilling Machine – a machine for drilling holes in the earth's crust. By types of bits are distinguished percussion-cable, coil, sonic-percussion, rotary, and flame-jet D.M.

Drilling Platform – a large structure for drilling holes in the seabed for oil and gas prospecting and extraction. By their design are distinguished stationary (fixed) drilling platforms (on legs or gravitational) and floating drilling rigs (submersible, semi-submersible, and self-hoisting). A type of a drilling platform is chosen with regard to the sea depths and concrete operating conditions. Sometimes drillships are also included into D.P.

Drilling Rig – a complex of equipment for drilling wells. By drilling method there are distinguished rotary (most widespread), percussion, sonic (vibratory), flame-jet, and other rigs. D.R. comprises a drilling machine, a drilling tower, a power supply unit, and mechanical equipment for lowering-hoisting operations. For rotary drilling, D.R. is provided with mud pumps and equipment to wash solution preparation, treatment, recovery, and others. D.R. may be configured for drilling oil, gas, and deep geological prospecting wells; to be mobile for geological surveys and drilling for water and in construction works; self-propelled crawler- or wheel-mounted rigs that are installed on a vehicle, tractor, boat, etc. and are designed largely for blasting drilling; and portable for prospecting drilling in not easily accessible regions.

Drilling Trestle – an overwater bridge-like structure on piles designed for location of drilling facilities and auxiliary equipment and also for connection of offshore platforms with the mainland. Since the early 1950 s, D.T. has been widely applied in development of offshore oilfields in the Caspian Sea. At depths up to 15 m, more than 350 km of trestles have been constructed that accommodate drilling towers, drilling technological equipment, accommodations and warehouses, roads, and landing pads for helicopters.

Drought – a protracted period of weather condition with a considerably reduced amount of precipitation, often against the backdrop of an unusually high temperature. Leads to depletion of air humidity. As a result of D., unfavorable conditions

are produced for the development of plants and water bodies, including watering spots for wildlife and domestic animals, dry up. As a rule, D. leads to a catastrophically poor harvests of agricultural crops, degradation of rangelands, mass loss of livestock, etc. D. is a catalyst and “motivating force” for desertification. “Drought is a natural phenomenon that emerges when the amount of precipitation is much lower than the normal fixed levels, which causes grave disturbances of hydrological equilibrium that has an adverse impact on the productivity of land resources” (Convention on Combating Desertification, 1994). D. is characterized by long durations, high intensities, and recurrences. The following types of D. are distinguished: soil, air (atmospheric), climate-related (meteorological), agricultural (agroclimatic), hydrological, physiological, and socioeconomic.

Dry Fish – fish after spawning; fish without eggs.

Dubendy, Oil Terminal – the largest bulk-oil terminal on Apsheron Peninsula, Azerbaijan Republic. Oil from Kazakhstan, Turkmenistan, and Azerbaijan is unloaded at this terminal and then exported to the Black Sea ports and on to the world markets. The terminal has 2 piers accommodating four 5,000–12,000 t oil tankers at a time. The terminal is capable of processing up to 10 million tons of cargoes per annum. When 2 more piers are commissioned the terminal turnover will reach 20 million tons. The terminal operates a ship traffic control service ensuring the safety of navigation within the water area. Two tug-boats of 600 and 1,600 HP capacity provide for safe moorage of ships.

Duvannyi – the northernmost island of the Baku Archipelago, located on the coastal shoal 11 km southeast of Sangachal Cape and 9 km northeast of Alyat Cape in Azerbaijan. The island is small with a 42 m high hill in its middle part and a few mud volcanoes. The length of the island is 2 km. The island is surrounded by oil-derricks. The Turk name of the island is *Zembil'* – “tin-plate basket” (from afar the island resembles an overturned basket). The present name of the island apparently stems from the word *duvan*, which in the Volga Region means “an open elevated place.” It had long been thought that the name of the island stemmed from the Turk word *divan*, meaning “meeting, council, custody of deeds, financial estimates,” and that the island is called D. because during the seventeenth century it where the Cossacks allegedly used to share the booty amongst themselves.

“Dvigatel Stroi” – see *Kaspiisk*

E

Early Oil – relates to relatively small quantities of oil recovered at the early stage of oil field development.

Earthquake – underground shocks and oscillations of the earth caused mainly by tectonic processes. E.'s energy is appraised by magnitude or energy class scales, and the surface effect is expressed in points on an intensity scale. The number of E. registered on the Earth each year runs into hundreds of thousands. There have been major earthquakes noted in the Caspian region: Krasnovodsk (1895), Daghestan (1970).

Eastern Sea – see *Great Eastern Sea*

Eggs in Sac – ovaries of female fish with eggs before spawning; eggs of the sturgeons and chastik fish in film and also the film itself.

Eihwald Eduard Ivanovich (1795–1876) – a well-known naturalist and doctor and one of the oldest members of the Russian Geographical Society who worked for a long time in its ethnographic division. Being professor at Kazan University (later he also worked in Vilno and Saint Petersburg and received the academic degree of Doctor of Surgery from the Medical Surgical Academy and Doctor of Philosophy from Breslavsky University), he visited the Mangyshlak Peninsula, Cheleken Island, and Krasnovodsky and Balkhansky Bays of the Caspian Sea in 1825–1826 where he gathered botanical and zoological collections and studied the geological structure of the territory. He observed the life of the coastal Turkmen and published interesting notes about their ethnography. In the same period, he visited many places in the Caucasus, including Daghestan, some regions of the Trans-Caucasus, and the Northern Caucasus.

Eihwald E.I. (http://upload.wikimedia.org/wikipedia/commons/0/07/Karl_Eduard_von_Eichwald.gif)



Elburz – the mountains in north of Iran that run nearly parallel along the southern coast of the Caspian Sea. Etymologically, it is connected with the name Elbrus (in the nineteenth century – Elborus) and the Indo-European base “*elb*,” meaning mountains. It runs as far as the Talysh Mountains, merging with them in the west, and as far as the Nishapur Mountains in the east. Their length is



Elburz mountains (http://www.dusharm.com/images/stories/damavand/mt_damavand_iran_large.jpg)

about 900 km, and their width is up to 120 km. They consist of several parallel ridges composed largely of limestone and sandstones and have steep slopes and more or less flattened tops. Their maximum height is 5,604 km at the dead volcano Damavand, the conical top of which is covered by permanent snows. E. creates a specific subtropical climate on the Caspian coast. The mountains are cut through by the Sefid Rud River gorge, and deposits of oil and copper ores are found here. Thorn pillow-like bushes prevail here, while the northern slopes are overgrown with thick broad-leaved forests covering an area of 1.9 million hectare, or 53% of the forests of Iran. The Trans-Iranian railroad cuts through the mountains.

Elista (in Kalmyk “*elista gazar*,” meaning sand-abounding terrain or sandy terrain) – the capital of the Republic of Kalmykia, Russia. It is located in the southeastern part of the Ergeni Upland. The Elista area is a deep flat-bottomed valley with a water stream belonging to a basin of external waterways flowing into the Yashkul River. In the Middle Ages, the road from the Lower Volga to the Crimea, the so-called Crimean Tract, flowed along the E. area. In the 1870s, the “Salsky Road,” running to the west of E., was first exploited and was where the Tsaritzyn-Stavropol tract started. In 1852, the first trees were planted here (Elista Forest Area), which was the basis for the future city park “Druzhba” (Friendship). In 1856, K.M. Bayer visited this place, which at that time was the summer headquarters of the Erketenevsky ulus, and in his notes he called it “Ilistovo.” In 1865, a permanent settlement appeared on the Elista River (presently Elistinka) of the Chernoyarsk ouezd of the Astrakhan Province. From 1918, it became the center of the Elista ouezd, and from 1930 it was the city of E. From 1935, it was the capital of Kalmykia. In 1944, after deportation of the Kalmyks and liquidation of the Kalmyk



Elista (http://www.ruvr.ru/files/Image/RiaNovosti_foto/GORODA/elista.jpg)

ASSR, it was renamed Stepnoy (entering into the Stavropol Area), but in 1957 the original name was restored. Its population was 103 thou. (2009). It contains plants for manufacturing of refrigerators, furniture, building materials, etc.; has light and food industries; and processes wool and sheepskin coats. Kalmyk State University, a regional historical museum, a drama theatre, a philharmonic hall, and a picture gallery are all here. For transport, there is a railway station, a road junction, and an airport.

The monument of Buddha and Kazan Cathedral are constructed in E. The Chess City, also called “New Vasyuki,” was built in E. and near its entrance is the monument to the literary hero Ostap Bender surrounded by 12 chairs. The Chess City was opened in 1998 and hosts the World Chess Olympiad. It also became an administrative district, with the special status and the place for holding public, scientific, cultural, and sports events and residences for their participants.

The architecture of E. is Oriental in style which makes it quite unique.

Emba – river in the northwestern part of the Kazakhstan Republic. Its length is 647 km, with a basin area of 45.8 thou km². It takes its origin on the western slopes of Mugodzhar and then runs over dry steppes and in its lower reaches over the deserts and semi-deserts of the Caspian Lowland. In its upper reaches before inflow of the Temir River the width of its valley varies from 200 to 2,000 m. More downstream, the valley widens, reaching 7 km; its slopes are steep. The river flows here in one channel, breaking into arms further on. In its downstream part, approximately 100 km before the Caspian Sea, it turns into a chain of lakes that become connected with each other via channels only during floods. The waters of E. reach the Caspian Sea only in water abundant years, forming a delta with the main arms Karauzyak, Kiyani, and Kulak. One of the first pilot books of the Caspian Sea (1884) mentioned that 170 years prior large vessels could enter the E. Delta. River is fed mostly by snowmelt. During spring floods, about 95% of the annual flow passes through the upper reaches and up to 100% pass into the lower reaches. The river is covered with ice in November, and the ice cover is broken in late March in the lower reaches, and in the upper reaches somewhat later, in April. The main tributary is Temir. The E. waters are withdrawn for irrigation. Oilfields are developed in the E. basin.

Emba Oil Basin – extends from the Mugodzhar Hills in the east to the Volga lower reaches in the west and from the southern offspurs of the Ural to the north as far as the northern coast of the Caspian Sea and Ustyurt Plateau in the south, Republic of Kazakhstan. From ancient times, this region was known as “*maily kiyani*,” meaning the lands permeated with miracle oil. In the mid-seventeenth century, British merchant Gok on his way to Abulkhair-Khan came upon a spring near the Emba River that spouted not water but oil. The first oil in E.O.B. was produced in small quantity in 1899 by A. Nobel, the famous inventor and industrialist, who drilled a well in the Karachungul area. This event became a starting point for Kazakhstan on its long way to the status of an oil state. The development of oil producing industry was started in 1911 when an oil gusher blew out on the Dossor oilfield. Soon other

oilfields were discovered: first, Makat, followed by Sagiz, Karatov, Baichunas, Iskine, Kychagyl, Kulsary, Komsomolsky, and Zhetybai. Bottom-hole oil pumping was the main method of oil production. The greater part (70%) of recoverable oil resources is characterized by high viscosity, and their development is not efficient without an impact on the horizon. The main way for increasing oil yield is pumping of accompanying stratum water into formation. An oil refining plant was constructed in Guriev (Atyrau), and some oil pipelines were built, such as Guriev (Atyrau)–Orsk and others.

Emergency Oil Spill – a type of marine environmental pollution that causes considerable damage to flora and fauna as well as to the economics of coastal countries in the zone of pollution. By nature and scale, there are two distinguishable types of (EOS). The first includes spills related to leaks of oil and oil products from tankers, both on-land and on-sea oil and gas storage facilities, due to accidents (running aground, collisions, explosion, fire, etc.) from which the total volume of spilled oil may reach up to 400 thou t. Emergency oil blowouts during drilling works on the continental shelf also fall into this category. The second type of EOS includes leaks that occur due to failure of or damage to technological equipment, underwater or over-water pipelines and connecting hoses on tankers, marine oil storages and drilling platforms, or mistakes in operation of cargo systems.

Environmental Disaster – a devastating change to the natural environment across a vast territory caused by destructive natural or anthropogenic forces. The destruction may be irreversible.

Environmental Impact Assessment – activity aimed at the discovery and forecasting of anticipated impact of various activities and projects on the environment, human health and well-being, and subsequent interpretation and transfer of the obtained data; a study of the adverse effects of the impact of planned projects on natural environment, health, living conditions, and economic activity of the population and the state of cultural values. EIA is a special examination of ecological expertise, the purpose of which is to make a project environmentally-sound; improve its ecological characteristics; prevent, soften, or recompense possible ecological damage; and prevent project-related expenses and costs conditioned by environmental contingencies.

There are three major types of assessment: (1) EIA of designs of specific technical or economic projects (dams of waterworks facilities, irrigation systems, etc.). (2) EIA of regional designs relating to the construction of a complex of major facilities or technical systems capable of exerting a cumulative impact on the environment within rather extensive areas. (3) EIA of designs relating to development within the scope of particular industries and involving the establishment of a number of relatively small similar economic facilities, the impact of each of which may be insignificant but their combined effect may be subject to assessment.

Environmental Monitoring – a system of observations enabling identification of a condition and changes occurring in the biosphere affected by the natural and anthropogenic activities. The analog of E.M. is monitoring of the natural environment. One of the elements of the E.M. system is the automatic early warning system and monitoring of emergency oil spills.

Environmental Parliament of the Volga Basin and Northern Caspian (Ecoparliament) – Created in December 1990, it is the first inter-regional ecological association of deputies. The main task of E.P. was to facilitate in practice the exercise of ecological rights by the population in Povolzhie, revival of people's traditions of rational nature management and culture, and, in general, formation of an integral system of environmental security. The founders of E.P. were 4 republican, 11 regional, and 1 city Councils of People's Deputies. By early 1993, E.P. comprised deputies from 29 RF subjects of the Volga Basin. The total membership of E.P. was 60 people. The scientific-technical council of E.P. was controlled by the deputies of preparation of the Program "Volga Revival". For the first time the legislative, executive authorities, and the public were interacting in the elaboration of state programs. In January 1994, E.P. was transformed into the Interregional Environmental Association of the Volga Basin.

Environmental Safety – the status of international relations ensuring preservation, rational management, reproduction, and quality improvement of the natural environment for sustainable and secure development of all states as well as the creation of favorable conditions for the life of people. It can also be considered a part of a comprehensive approach to international security.

Esenguli (formerly Gasan-Kuli) – an urban-type settlement in Turkmenistan, it is located 8 km from the Caspian Sea and 320 km to the southeast of Turkmenbashi. A fishery and carpet-making are developed here. The ornithological nature preserve is found in the area. The state border between Turkmenistan and Iran goes out to the sea southward of E.

Esenguli Branch – is a part of the Khazar nature reserve, Turkmenistan. It was established in 1933 as the All-Union Gasan-Kuli ornithological nature reserve and extends over the southeastern coast of the Caspian Sea. Its area is 69,700 ha. This nature reserve was organized for protection and study of the Caspian Sea's largest hibernation areas for water fowl and near-water birds. E.B. is divided into 2 parts: one part covers all marine shallow areas in the Southeastern Caspian extending for 40 km, nearly the half of the Adjiyabsky spawning grounds and the Karaburunsky floodplains; and the second part, which includes the Lesser Delili Reservoir and the Greater Delili Lake. In 1968, it was included into the Krasnovodsk (Khazar) Ornithological Nature Reserve.

The climate in E.B. is rather mild. Precipitations are up to 200 mm. The summer is dry and hot, while the winter is warm. The sea is not covered with ice. The typical feature of the flat relief here are mud volcanoes and residual mounds of the

Ancient Caspian terrace. E.B. is confined to the sandy-silty deltaic plain. Its prevailing landscape is low-lying coast with small, waterlogged lagoons and the Atrek floodplain with a system of small pools. The area of the water bodies in E.B. suitable for habitation of wetland birds is 1,100–3,500 ha depending on water availability in temporary water bodies.

The nature reserve has intra-zonal vegetation in the floodplain and Atrek dry delta. The Atrek floodplain and some coastal areas are overgrown with sedge, cane, and cattail thickets. The cane thickets are a 3–4-m high wall surrounding the water bodies. In these places, boars and jackals are quite usual, as are jungle cats and foxes. Rats are also frequently found here. The unique feature of these places is the black francolin, a very valuable bird of the gallinaceous.

Warm winters, non-freezing sea, and abundant food attract a great number of birds, first of all, ciconiiformes and water fowl. About 240 species of migratory and hibernating birds are numbered here. Among them there are flamingo, mute, whooper, and Bewick's swans. Of large birds are gray geese. There are thousands of smaller water fowl of which most numerous is coot. About 8 species of river ducks hibernate here, including mallard, gadwall, wigeon, pintail, common shoveler; while teal include common teal, garganey teal, and marbled teal. Diving ducks are also here, including crimson-headed, red-crested, and white-eyed, as are scaup and tufted ducks, goldeneye and long-tailed ducks and others. In winter, around 60 thou birds may be found here.

The vegetation in the Caspian shallows is represented by the thickets of sea-grass, eelgrass, spiral widgeon grass, fennel-leaved weeds, and seamaid. Many algae are found here, such as green algae (stonewort, entomorphs and cladophores), and red algae and brown algae (entocarpus). Many mollusks, ostracods, and fish live around the algae.

Among the birds of prey is the white-tailed eagle, which winter here. The birds permanently nesting here are numerous sea swallows, seagulls (silver, black-headed, common), sea loverbirds, and various species of sandpipers.

Esenguli Etrap – one of the etraps of the Balkansky velajat, Turkmenistan. Its center is Esenguli.

Esenguli Nature Reserve – see *Esenguli Branch*

Esenguli (formerly Gasan-Kuli) Plain – the recent surface of the deltaic plain of the Atrek River, it stretches as a wide strip in the southernmost part of Southwestern Turkmenistan along the Iranian border at absolute elevations lower than –10 m. The distinctive features of its flat surface are the mounds with steep slopes and arched tops that are reminiscent of Baer knolls. These mounds have a sub-latitudinal extension: east–northeast–west–southwest. Their height is 10–12 m and a maximum length of 2–3 km. Their surface is composed of sands. The elevations of the western part of the delta vary from –15 to –20 m abs. elev. Solonchak depressions are often found here. Their bottom elevations range from –24 to –25 m in the southwestern part. The primitive takyr-like solonchaks and typical solonchaks are also found in

the plain. The drainless depressions are composed of meadow saline soils that are partially cultivated for growing cotton, vegetables, and orchards.

“Estakadny” – a monument of nature located within the wetlands of the Volga Delta. It is used for protection of the spawning grounds of the valuable fish species.

Etrap (Former Region) – an administrative-territorial unit in Turkmenistan. It is a part of velajat.

Eurasia – The largest continent in the Northern Hemisphere (a number of the islands are located in the Southern Hemisphere) of the Earth. The name of the continent is the result of putting together the names of two parts of the world: “Europe” and “Asia” that are within its limits. The generalized name of the continent was first used in the first half of the nineteenth century by the well-known geographer A. Humboldt. The area is about 53 million square kilometer. Population – about 4.6 bn people (2008). E. is united due to land continuity, the existing tectonic consolidation of the mainland, and the similarity of many climatic processes. Territorial divisions of Europe and Asia have changed on more than one occasion over the course of historic development and at present the two parts are divided by arbitrarily adopted boundaries (more often than not those boundaries are: the eastern foothills of the Urals, the Emba River, the Caspian Sea, and the Manych River).

Eurasia (Azov-Caspian) Canal – project on navigation canal between Azov and Caspian Seas pathing from Sea of Azov via Western and Eastern Manych and Kuma River.

“Eurasian Balkans” – term introduced by Z. Brzezinski, former National Security Adviser to US President (1977–1981), in his book *The Grand Chessboard: American Primacy And Its Geostrategic Imperatives* (1997). EB covers a vast territory, delimiting a central zone of global instability and include the areas of Southeastern Europe, Central Asia, and parts of South Asia as well as areas of the Persian Gulf and Middle East. EB constitutes an internal nucleus of this enormous territory representing a power vacuum. An unstable situation is observed not only in the political constituent entities, but also in the temptation for interference by more powerful neighbors, each of which is full of resolve to resist the dominant role of other neighbors in the region. It is this combination of power vacuum and proxy force that justifies the term “EB.”

EB include 9 countries: Georgia, Armenia, Azerbaijan, Uzbekistan, Kazakhstan, Turkmenistan, Kyrgyzstan, Tajikistan, and Afghanistan. Turkey and Iran are potential candidates for being included in this list. According to Brzezinski, this is a “melting pot of ethnic contradictions,” while 3 states that border one another (i.e. Russia, Turkey, and Iran) are competing for EB. Albeit not immediately, Ukraine, Pakistan, India, China, and the US may be involved in the rivalry, too. Exploration and use of new sources of hydrocarbon materials and, in particular, those in the Caspian Sea basin have given rise to economic development here. In view of

the access to these resources and participation in the distribution of the region’s potential wealth, goals emerge that spur national ambitions, motivate corporate interests, fuel historic claims, revive imperial aspirations, and stir up international cooperation.

Eustatic Variations (from Greece *eustathes* – “calm, constant”) – are slow (“age-long”) variations of the level of the World Ocean. This term is often used for description of long-term variations of the Caspian Sea level.

F

Fairway (Dutch “*sale, move*” plus “*water*”) – a waterway for safe passage of ships.

Fan (*Germ.*) – the warm and dry wind blowing from the mountains most often in the cold season of a year in the upland western and southern coasts of the Caspian Sea. It causes a quick rise of air temperature (near Derbent the air temperature may rise by 10–12°C for a few minutes, while near Lenkoran it may rise by 15°C and even 20°C; the same phenomenon is observed near port Anzali). Fan wind velocity may reach 15–20 m/s. F. is often accompanied by lowering of relative humidity. Fans are most prominent in the surroundings of Lenkoran (Azerbaijan) and Anzali (Iran), where they are called “Girmich”.

Fauna and Flora of the Caspian Sea – the life of the Caspian Sea is highly varied by its origin. Prevailing are specifically Caspian species (about 65%), descendents of marine Tertiary fauna that was altered during the evolution of the water body and its separation from the ocean. The most typical fish are herring, sprat, and bullhead; as well as mollusks (cardium and zebra mussel); and many crustaceans. Many of them are endemics not found anywhere else except in the Caspian. The second group (about 25%) is represented by freshwater species that settled in the Caspian during the periods of its freshening and adapted to the lower salinity level as, for example, such fish as carp and the perch. At the end of the glaciation period, the Caspian was invaded by some Arctic invertebrates and fish (salmon and sheefish) as well as seals that remain in the Northern Caspian. The final complex is Mediterranean species. Most of them intruded into the Caspian quite by accident (attached to ship bottoms or in ballast waters), in particular after the 1950s when a waterway between the Caspian and the Azov seas along the Volga-Don canal was opened. In addition, in 1930–1940 gray millets and two invertebrate species – clam worm and abra – were intentionally resettled here. They adapted well and became the main food for the sturgeons; however, not all intrusions of new species were positive. Thus, in the late 1990s the comb jellyfish *mnemiopsis* intruded from the Black Sea into the Caspian and began propagating extensively. Eating plankton, it deteriorated the forage base of sprat, the main commercial fish species in the Caspian. As a result, the sprat population declined quickly. At present, actions aimed at arresting further spread of the jellyfish *mnemiopsis*, are being developed.

The basis of the primary organic substance is made by phytoplankton that numbers 450 species, of which diatom, blue-green, green, and peridinea algae are prevalent. The phytobenthos contains more than 350 species, including, apart from the algae, flowering plants (eel grass, pond grass). Zooplankton species number more than 300. In terms of biomass, the Northern Caspian is dominated by copepoda and cladocerae, and the Middle and Southern Caspian is dominated by copepods (limnocalanus and eurythemora). Zoobenthos numbers include approximately 400 species of free-living invertebrates of which mollusks, crustaceans, and worms prevail. The Mediterranean intruders (rhizoalgae, mitiliastrum mollusks, abra and others) have become dominant in terms of biomass in the plankton and benthos communities, having replaced local forms.

The total number of species and subspecies of fish living in the Caspian and in river deltas exceeds 120. By ecological features they may be divided into 4 groups: marine fish whose full life cycle is connected with the sea (sprat, some herring, gray millet); migratory – living in the sea until attaining maturity and then running for many hundred of kilometers upstream in rivers for spawning (sturgeon, great sturgeon, starred sturgeon, bastard sturgeon, white salmon, some herring); anadromous – feeding in low-saline seas and propagating in water bodies formed during floods in river deltas (sea roach, bream, common carp, pike perch); river – living permanently in freshwater lower reaches and mouths of rivers (catfish, pike, and others).

The Caspian is a traditional fishing area. In the past, herring and anadromous fish made the basis of catches. Of great significance was fishing of the sturgeons (in the early twentieth century their catches reached nearly 40 thou t) and production of balyk and black caviar. Historically, the Caspian had the greatest population of sturgeons, until recently providing up to 80% of the world catch. At present, the sturgeon population is shrunk significantly due to the sea pollution and unauthorized fishing (large-scale illegal fishing). Restoration of the sturgeon population is one of the most burning issues of the Caspian Sea.

The Caspian is famous for abundant waterfowl. Some species fly here from the north for hibernation, while others come from the south for nesting. In the first group are geese, swans, ducks, brants, swallows, loons, and stints, while the second group is comprised of sea eagles and others. Many birds are especially found in the mouths of the Volga and Ural Rivers, in Kyzylagach Bay, and at Turkmenbashi. Fish-eating birds on the Caspian Sea number over 600 thou; every year they eat great quantities of fish.

Ferry – a form of transport used to carry passengers and their vehicles as well as freight across a body of water. By their purpose are distinguished railway, passenger-vehicle, and universal ferries. F. may be self-propelled or barge, and sea or river.

Ferry Line – a common carrier of vehicles, railway cars and passengers over water between designated places. There are several ferry lines on the Caspian Sea, such as Baku–Turkmenbashi (Krasnovodsk), Baku–Atyrau. In 2005 new ferry lines between Olya (Astrakhan Region) and Baku, Turkmenbashi, Aktau, and Anzali were open.

Ferry Line Baku–Krasnovodsk (Turkmenbashi) – was opened on the Caspian Sea in 1962 to connect the Central Asian railroad with the Caucasus railroad. The length of the line is 306 km, and the sailing time is 12 h. The following ferries have operated on this line: “Azerbaijan,” “Turkmenistan,” “Professor Gyul,” “Uzbekistan”, “Khamid Sultanov, and “Kazakhstan,” Each of these ferries could carry dozens of railway cars and at least 350 passengers. This line was restored to service in 1998.

Fish Breeding – (1) Branch of economy oriented to increasing and improving the fish stock in natural water bodies (sturgeons, salmon, whitefish, carp, pike perch, pike) or in man-made analogs thereof (ponds, reserved parts of water bodies and water courses and suchlike places); (2) discipline of applied science dealing with principles and methods of fish breeding in man-made and natural water bodies.

Fish Bypass Canal – man-made canals that allow sire sturgeons and semi-anadromous fish to pass into the Volga and young fishes to run seaward into the North Caspian. The construction has been under way since 1949. Twenty five canals have been built of a combined length of 880 km, of which there are 9 main canals (555 km) and 16 auxiliary ones (325 km).

The eastern part of the delta features the following main canals: Genyushkinsky, Igolkinsky, Obzhorovsky, Karaisky, Belinsky (navigable), and Tishkovsky; and auxiliary canals: Telyachinsky, Kanychinsky, Mokrinsky, Staro-Igolkinsky, Vassilievsky, Rychinsky, Sukhonsky, and Poldnevsky.

The western part of the delta has the main canal Gandurinsky; and auxiliary canals Trekhizbensky, Karalatsky, Kulginsky, Nikitinsky, Pravyi Gornyi, Zyudevsky, and Tsaplinsky. The last two gravitate toward the Volga-Caspian Navigation Canal.

Fish Carving – cutting fish into parts before salting according to special rules. For example, mature great sturgeon would be cut as follows: first the head was separated, then the belly, followed by the sides (soft-flesh parts) and, finally, the back which is cut lengthwise in pieces (round pieces), starting with the tail fin (wagger). The tongue (tumak) would be cut out of the head. Each part would be salted separately.

Fish Glue – made of strippings (outer film) of the float of great sturgeon, sturgeon and stellate sturgeon (to lesser extent, of barbells): great sturgeon, sturgeon and stellate sturgeon glue.

Fish Measure – standard fish length. The length of fish body, when the fish is alive and fresh, is determined by a straight line from the end of snout to the beginning of middle somactids of the tail fin (ignoring the length beyond those points).

Fish Nursery – establishment where fish are impregnated, roe are incubated, and young fish are grown for subsequent raising to a commercial size in fish-breeding ponds or for releasing fishes in natural water bodies.

Fish Pass – (1) Device enabling the fish to travel from the tail race of a headwork that dams the river up to the head race. F.P. is a chute or canal over which the water

moves from the head to the tail race at a velocity allowing the fish to pass up the stream. The cross-section of F.P. should be of sufficient size, with its walls as close as possible to the natural channel. Chute-type F.P. are provided with bafflers or other arrangements that enhance roughness, thereby reducing stream speed. (2) Structures with mechanical devices to transfer fishes over obstructions (i.e. fish elevators and fish locks).

Fish-Passing Facilities – built in headworks to ensure reproduction of anadromous fish during the setting up of hydraulic structures on the rivers. By the principle of fish passing, F.F. are divided into the following main types:

- fish passes (ladder-type, pond, chute, bypass canals), in which a real stream-flow of water is produced with velocities enabling the fishes to pass around the headwork;
- fish elevators, hydraulic and mechanical one or two-shaft in which fishes are passed with the aid of lifting mechanisms;
- fish-passing locks pass fish by lock mechanisms;
- floating fish-passing facilities set up separately from the head works and comprising a fish-storage hopper, two container ships for fish transportation, and an electrical fish guide.

Also in existence are fish-passing complexes arranged downstream of a hydroelectric plant and consisting of a floating fish-storage hopper as well as an electrical fish guide, a container ship to transport fish from the fish-storage hopper to the bank jetties, with subsequent reloading of the fish into live-fish automatic containers with a life support system to transport fish to the spawning grounds.

Examples of fish-passing facilities are Kargalinsky ladder-type fish pass (the Terek River), Zeme-Avchalskii (the Kura River) chute fish pass, hydraulic fish elevator on the Volgograd hydroelectric plant, Astrakhan water diseer (the Volga River) – fish-passing locks.

Fish Protection Structure – special device preventing passage of fish to a zone dangerous to fish or to the technical facility.

Fish Sheet – fish cut along the spine, salted, and ready for eating within 2 days (Caspian herring).

Fish Salting – a method of fish preservation with salt suppressing the action of bacteria and ferments. The most popular types are the dry stack and barrel methods. The stack method is mostly used for salting cod and salmon, sea perch, catfish, and halibut. After removal of viscera, removal of the head, and filleting, the fish is washed, salted, and set in the vessel's hold with the lower layer (skin downward), followed by a layer of salt, then an upper layer (with the skin upwards) and so on. The amount of salt is 80–100% of the fish mass. A good drainage of brine into bilges is ensured here. Four to five days after first salting the fish, they are placed one-by-one in a new pile after the stuck salt is carefully removed and they are recovered

with new salt (20% of the fish mass). The height of the pile at initial salting should not be more than 120 cm, but at secondary salting there is no limitation.

With the tiers method, the fish are carefully mixed with salt and placed in a heap into preliminary wetted barrels. In the course of filling, the barrels are shaken and the upper fish layer is covered with salt. The total amount of salt in a barrel depends on the season, air and water temperature, fat content of the fish, and the temperature in specific vessels' holds. After finishing, water is poured into barrels 10–20 cm lower than the upper slot level. After keeping barrels for 1–2 days or in a hold for 7 days, their contents are reloaded into a reservoir where the fish quality is checked and fish from the same day of salting is added. Then the barrels are filled anew and brine of 9–25% salt solution is added, if necessary. After this, the barrels are sealed and put into a hold. Such salting is called interrupted.

Fishing – commercial – catching fish (and other fish aquatic animals except mammals) as valuable foodstuff or raw material for the production of fertilizer and for other technical purposes (fish glue, fat, etc.); sport fishing – catching fish (as well as crustaceans, mollusks, and other living aquatic organisms) for the purposes of recreation.

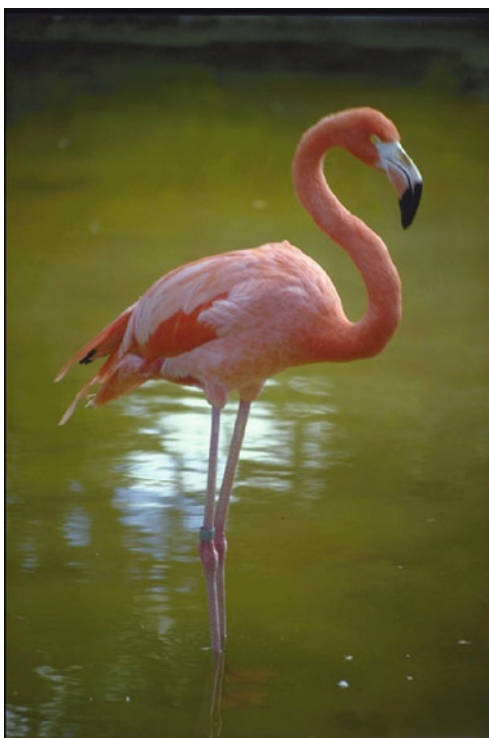
Fishing, Cossack Way – a peculiar traditional occupation of Ural Cossacks that came into being on the Yaik (Ural) River in the eighteenth century. Fishing in the Caspian Sea and on the rivers flowing into it became a matter of concern for the Russian state early in the eighteenth century. In 1754, Greben Cossacks were allowed to fish and thus meet their personal needs at the rate of 50 fish/person. Any excess quantity of fish caught was penalized by a fine of Rbls. 10. In 1765, a decree was issued in St.Petersburg, whereby it was prohibited to give away fisheries for farming. The FCW system was introduced by the first Orenburg Governor I.I.Neimoyev and consisted in a strictly organized fishery. The idea was to provide equal fishing conditions for all fishermen. The FCW regulations enabled the participants to fish in a particular segment of the river at a minimum time and labor consumption and at a proper season of the year, when the fish and fish product were of maximum value. Fish was caught in the Yaik River four times a year. The first catch was in spring (from mid-April to June) (spring plavnnya), when Cossacks would catch stellate sturgeon from row-boats using driftnets. Large sturgeons – beluga, great sturgeon, and barbell sturgeon that were netted would normally be released back to the river. The second catch – in autumn (autumn plavnnya) – was the whole month of October. Then, from mid-November to mid-December, river fish would be caught with home-made trap nets. From January to late February, a crucial fishing time would take place using gaffs (gaffing is when great sturgeon and beluga are caught with gaffs in piscaries). Gaffing would commence on a pre-determined day with a “gift” (royal) fishing, the yield of which would be sent to the tsar’s court. The signal of such fishing commencement was a cannon shot, whereupon all Cossacks on active duty and paid made their way to the river. Each of them made as many ice-holes and gaffed as much as he could without using hired hands. Gaffing lasted up to a month, during which time a single Cossack could gaff around 40–50 sturgeons and belugas. When gaffing was under way, normally quite a few

merchants would arrive to buy the yield. In 1894, pursuant to “Regulation on Fishing Procedure in the Urals Cossack Force,” the position of military fishing technician was introduced for the first time ever in Russia.

Fishing Season – the time of mass fishing in spring winter. For the Caspian Sea this is one-way sailing from one wharf to other.

Fishing Vessel – a vessel for commercial catching and processing of fish, sea animals, mollusks and algae and for their transport.

Flamingo (*Phoenicopterus roseus*) – a representative of the ciconiformes order, flamingo family. This is a large, very beautiful bird standing high on its thin long legs and having a long thin neck. It has a rose-whitish coloring, most intense on the wings; the ends of the wings are black. The beak is rose and black; the legs are rosy. The wing length is 46 cm. The bird weight is 4.4 kg. It nests in colonies in the coastal zones of marine bays and estuaries. The nests are made on shallow water or on a wet terrain flooded with water during surge events. It lays eggs (usually 1–3) in early May. It feeds on algae, sea grass, crustaceans and mollusks in shallow waters filtering water and sludge. Its hunting by humans is prohibited everywhere. F. makes nests on islands and in bays of the Caspian Sea. F. is included in the Red Book of rare species. It is also found in Southern Europe, Africa, Asia, and South America.



Flamingo (<http://www.photographer.com.ua/images/chapter1/Pic1.45.jpg>)

Fleet – a collective of single-purpose ships – military, merchant, fishing, whaling and others. The inland F. is a group of ships and other floating facilities designed for transportation of people and cargo along internal waterways or for fulfillment of engineering and accessory works related to transportation. Port F. is a group of auxiliary vessels registered to a certain port and designed for servicing the transportation and technical vessels in the port's roads. Local F. is a group of ships belonging to a port, agency, regional department, or operating division. Technical F. is a group of ships designed for maintenance of channel dimensions, such as dredgers, bucket and suction dredgers, bottom cleaning dredgers, hydraulic guns, and others as well as buoyancy vessels and lightboats. Transit F. is a group of ships managed by a steamship company and making trips within the command area of several or one steamship company to great distances. Transport F. is a group of ships designed for carriage of cargo and passengers.

Floating Beacon (Light vessel) – a service auxiliary vessel designed to mark areas of nautical dangers to warn ships. F.B. are set in places where no navigation facilities are used. The lighting devices are mounted on special buoys, and the light is always directed to the horizon regardless of vessel oscillations. F.B. is provided with mist alarm systems, radio beacons, and radar beacons. Each F.B. has distinctive coloring and a name is written on its side. Thus, in the 1950s, F.B. “Zhemchuzhny” was installed to mark depths greater than Twelve-foot roads, and in the 1990s, F.B. “Astrakhansky priemnyi” was installed. In the early twentieth century, F.B. “Amir-Ade” was placed at an inlet into the Gorgan (Astrabad) Bay. This was the first meteorological station on the Iranian coast of the Caspian. It was in operation for dozens of years and looked like a “red single-mast vessel with white bulwark with an inscription on both sides *Shikhova Kosa* made with black paint.”

Floating Booms – floating barriers for controlling oil spills or for their guidance to a certain place for collection. F.B. are divided into mechanical, pneumatic, water-jet, porous, and absorbing, based on their function.

Floating Church in the Name of Saint Nicholas – constructed in the early twentieth century through charitable donations of private persons and local monasteries as well as money contributed by the Committee of the Caspian-Volga Fishery and Seal Hunting, it was constructed for the fishermen of the whole Caspian-Volga area (northern part of the Caspian Sea and Volga Delta) who usually spend several months far away from their homes and have no way of satisfying their spiritual needs.

Floating Drilling Rig – a hydraulic structure for drilling on water that have pontoons to ensure stability. The following types of floating drilling rigs are distinguished: submersible (SDR), semi-submersible (SSDR) and self-hoisting (SHDR). The submersible and self-hoisting drilling rigs are set afloat at installation in and removal from a drilling point and at movement from one drilling point to the other within a certain operating region or movement to a new region. During drilling, they set upon the ground with columns or lower body (supporting mat). Semi-submersible installations float through the whole operating period; during drilling

works they are floating in a semi-submersible state and are kept over the drilling point with an anchorage system or maneuvering devices. FDR are designed for exploratory drilling, but sometimes they are used also for commercial-scale development of oilfields with small oil reserves. The design and strength dimensions of FDR are chosen with regard to their production purposes, autonomy and external conditions (wind, waves, current, seismicity, ice conditions). The design of supporting parts of SDR and SHDR and also the quantity and type of anchors for SDR are dependent on ground conditions. In the cold season, SDR are used for about 5% of their total operating time; thus, SDR are mostly non-motorized. Their movement by towboats is conducted in good weather in view of the restricted capacity of towboats, low strength of high and flexible constructions of SDR (derricks, supporting columns) and other safety requirements. When being moved over large distances the upper sections of the SHDR columns are sometimes dismantled. In order to reduce the time of relocation the SHDR parts are transported on special barges. FDR are successfully operated in various water areas of the earth, including in regions with severe climatic conditions.

Floating drilling rig (<http://www.ltech.ru/UserFiles/Image/Star.jpg>)



Flood – inundation of a river valley above the annually flooded flood plain or location usually free of water (drained, coastal, shore, maritime, or in a depression). F. is produced by an abrupt input of snowmelt and/or rain water, by blocking the river

channel with ice (in spring), shuga or anchor ice (in autumn), or by wind-surfed water in river mouths or on low-lying seashores (usually in bays and on the islands). Floods often occur on the rivers of the Caspian Basin.

Fort Aleksandrovsky – name of Fort-Shevchenko City from 1857 to 1939.

Fort-Shevchenko – a city in the Mangistau Region, Kazakhstan. It is located on the coast of the Tyub-Karagan Peninsula, 13–14 km northward of Cape Urdyuk. The first settlement in this place was St.-Peter Fortress, construction of which began in 1716 by A. Bekovich-Cherkassky, an investigator of the Caspian Sea. In 1846, Novopetrovsky Fort was established here, but it was renamed Fort-Aleksandrovsky in 1818 in honor of Emperor Alexander II (1819–1881). In 1939, it received the name of Fort-Shevchenko in honor of T.G. Shevchenko, a Ukrainian poet (1814–1861) who was in exile in Novopetrovsky Fort from 1850–1857.

Foulings – colonies of aquatic organisms on natural and man-made solid surfaces: rocks, stones, submerged parts of ships, hydraulic structures, oil platforms, etc. F. are made of bacteria, algae, and invertebrates. In the Caspian Sea, there are 90 species of plants and 212 species of animals (mainly infusoria and Bivalvia).

Framework Convention for the Protection of the Marine Environment of the Caspian Sea – signed on November 4, 2003 in Tehran, Iran by four Caspian states. On November 8, 2003, these were joined by Turkmenistan. F.C. is the first document on multilateral cooperation on the Caspian Sea, signed by all coastal states. The Convention includes 9 sections comprising 37 articles.

According to F.C., protection of the marine environment of the Caspian Sea from pollution, including protection, conservation, regeneration, sustainable and rational use of its bioresources (Art. 2), is the goal. The Contracting Parties shall cooperate on a bilateral and multilateral basis in the development of protocols, stipulating additional measures of procedure and standards for F.C. implementation (Art. 3). Prevention, reduction and control of pollution pertain to pollution from land-based sources caused by operations on the seabed, from vessel discharges as well as by activities like land reclamation and associated ground excavation and dam construction. A special article provides for the prevention of invasive species being introduced (Art. 12). A special emphasis is on protection, conservation, regeneration and rational use of the bioresources of the Caspian Sea (Art. 14). Matters of managing dryland impacted by the nearness of the sea and fluctuating sea level are also attended to (Art. 15, 16). The stipulated procedures include assessment of environmental impact on the marine environment of the Caspian Sea (Art. 17), cooperation between the Contracting Parties (formulation, development and harmonization of the rules, standards, methods aimed at pollution preventing and reduction and control of pollution in the marine environment), monitoring, research and development, exchange of information and access thereto (Art. 17-21). The Conference of the Contracting Parties (Art. 22) and Convention Secretariat (Art. 23) shall be established to oversee the required institutional framework.

F.C. will be conducive to the consolidation of the efforts of the Caspian states to oversee environmental protection of the Caspian Sea and rational use of its resources, thereby meeting the national interests of all Caspian states.

Frazil Ice – a collection of loose, randomly oriented small snow pieces being formed in water before freeze-up. They are formed of ice slush that had been compacted by the action of currents or of bottom ice that has floated up in a stream or water body when the water becomes supercooled.

“Frederick”, “Friderick” – the only ship out of 10 others that were to have been built in 1636 in Nizhny-Novgorod of spruce wood for the Holstein-Persian trade. Its length was 120 feet, and its width was 40. It had 3 masts, and “the water draft was 7 feet.” It had 24 oars for sailing along rivers. It was named in honor of Duke Frederick of Schleswig-Holstein. A. Olearius wrote that the “Persian seafarers” examining the ship were amazed at its sizes and they said that “since the beginning of shipping on the Kolzyum (their name for the Caspian Sea) there had not been seen such a large vessel.” The first legation that set sail to Persia included 125 persons. In autumn 1636, “F” reached Astrakhan, and in November it entered into the Terek River and sailed as far as Derbent. Taking shelter near the Daghestan shores during a storm, it was cast ashore and destroyed.

Freeze-Up – the initial phase of ice formation in a river, sea.

Freshwater Fauna – inhabits fresh waters and river mouths with water salinity to 6‰. Some species of crustaceans and sturgeons tolerate well salinity levels to 15‰, but they prefer spawning only in fresh waters. Only the larvae of halophyte secondary water insects live in water with the salinity levels to 120‰; however, their fertilization occurs in air. Freshwater fauna of rivers of the Caspian Sea basin has different origins. Freshwater Akchagyl relicts kindred of brakish species of the Caspian Sea intruded here after opening of the Volga-Don canal. In the postglacial periods of the Holocene, Late Pleistocene, and earlier geological epochs the Arctic relicts resettled to the Caspian Sea Basin. In the Balakhansky time (approximately 5.5–3.5 million years ago), the Balakhansky relicts adapted to the life in fresh waters. In the freshwater fauna of the rivers of the Caspian Sea Basin, the species widespread in the Northern Eurasia dominate. Among them, the most well-known are the sturgeons. Their Atlantic and Pacific species also spawn in the rivers of North America. In the rivers of the Southern Caspian Basin, species that have come here from subtropical freshwater streams are rather numerous.

G

Gamriozen – a small river of the Daghestan Piedmont. Originates on the northern slopes of the Les Ridge and flows into the Caspian Sea. The catchment area is 359 km², and the length is 58 km. G. basin occupies the central part of the Daghestan Piedmont. River is fed by rainfall, snow-melt, and ground waters.

Gandzha Khanate – a state in Azerbaijan, in the Kura River valley that existed in the eighteenth to early nineteenth centuries. Center – Gandzha city. In 1795, it was conquered by Persia, and after 1804, it was part of the Russian Empire.

Gandzha Treaty of 1735 – “Treaty concluded at Gandzha on March 10, 1735” between Russia and Persia as a result of the talks between the Russian plenipotentiary envoy Prince S.D.Golytsin and the Persian Regent Nadir-Khan in a situation of war between Persia and Turkey, with the Russian-Turkish war of 1735–1739 impending. Under the Treaty, Russia was to return “without any coercion” the Cities of Baku and Derbent “and appropriate lands and villages” in exchange for the commitments not to transfer these under the rule of other states and to continue war with Turkey until all territories seized by it were regained. The two parties undertook not to conclude a separate peace with Turkey. As it followed from the Treaty, “for this good office and friendship offered by the Russian Empire, the Iranian state promises to maintain for ages neighborly friendly relations with the Russian Empire and to regard always Russian friends as friends, and to consider Russia’s enemies as enemies; and should anybody start a war against these two high courts, both the high courts shall engage in a war against such an enemy, and in all events shall the parties assist each other.”

Additionally, the Iranians reaffirmed the provisions of the Resht Treaty dated January 21, 1732 regarding “trade relations established on friendly terms.” It was also pointed out that in future Russian traders “would be allowed to berth at all harbors, quays, and at any points on the shores, and would be able to unload, store, and move their goods to other locations and would be able to sell such goods themselves without any coercion, nobody displaying any hatred towards the Russian traders.”

The terms of the GT were never honored by Nadir-Khan, who began separate talks with Turkey at the end of 1735 and concluded the 1736 Constantinople Peace Treaty with it.

“Garabogazsulfat” (formerly “Karabogazsulfat”) – largest production association (formerly, a trust). Established in 1926 for industrial extraction and processing of salts. Produces sodium sulfate, bischofite, Epsom salt, Glauber’s salt, medical and sea salt, and balneal sodium chloride.

Gas-an-Kuli – see *Esenguli*

Gas-an-Kuli Herring, or Kisselevich Herring (*Alosa brashnikovi kisselewitchi*) – large herring with a thick body, high rounded and blunt head. Gill rakers – from 43 to 53. Found in the waters of the South and Middle Caspian Sea only. Sometimes floats as far as Kara-Bogaz-Gol. Reaches 42 cm in length. Spawning in June–July and even August at a temperature of above 25°C, GKH is the most numerous of the South-Caspian forms of the species that used to yield up to 70% of winter drift fishing in the South Caspian Sea.

Gas Diplomacy – the concept used essentially in the media and meaning the international activity of natural gas exporting countries and their national companies aimed at promoting their interests in the field of recovery, transportation, and sale of this commodity on international markets.

Gas Pipelines – pipelines intended for gas delivery overland and at sea. The concept of GP embraces the pipeline and all structures and facilities (compressor stations, dispatcher’s office, etc.). Purpose-wise, GP are subdivided into main, gas-gathering, gas-distributing, and interconnecting. A system of interconnected GPs constitute a gas network.

Gauging Rod (German – *Fußstock* from “*Fuß*” – foot and “*stock*” – measuring rod) – a graduated measuring rod installed in a gauge station near a seashore, river, lake, or any other water body to record water levels. In the Caspian Sea, GRs are located in Baku, Makhachkala, Turkmenbashi, and Aktau.

Sometimes GR is a measuring stick 3–5 m long that is lowered from boats and ships for measurement of shallow depths.

The zero of the Kronstadt Sea Gauge (*Fußstock*) in the Gulf of Finland is taken as the basis for all state leveling works in Russia.

“Gavan” (Harbor) – part of the port water area protected from the waves and winds with natural or man-made barriers and adjoining the port area. G. is used for the placement of ships for freight operations both at onshore terminals and in shipping lanes. According to purpose, G. are subdivided into: oil, coal, timber, grain, etc.

Gekatei Miletsky – Hekatei of Miletus (GM) (Gr. *Hekataios*) – Greek historian and geographer – end of the sixth to beginning of the fifth centuries B.C.E., a

contemporary of the Persian King Darius I. Reliable materials of observations and fundamental knowledge gained during long travels (Agathemerius of the third to fourth centuries B.C.E. called GM “Much-travelled”) coupled with profound knowledge of the life of foreign peoples and their customs enabled GM to produce historical works and gain influence in the political life of Ionia, part of the western coast of Asia Minor that was colonized by the Greeks, especially the Ionian uprising against the Persian conquerors.

GM wrote the books “Round-the-World Voyage”, “Travel over the Earth” (“Earth Description” – description of the countries of Europe and Asia), and 4 books of “genealogies” (genealogy of noble Greek ancestries). Despite the poetical “The Sun Pond”, GM invents a different name for the Caspian Sea – Hircanian Sea. GM writes about this sea: “The so-called Hircanian Sea is surrounded by high wooded mountains.” The Hircanian to GM was part of the North Ocean referred to as Amalhean Sea all along the northern Scythian shores.

In his historic essays, GM frequently used myths, legends and tales, some of which he had remade. GM had a strong impact on Herodot (relationship between geography, ethnography, and history). A map of the Earth drawn up on the basis of Anaximander’s map was attached to GM’s geographical composition. This map for the first time designates three parts of the world – Europe, Asia, and Libya. Boundaries of the Pont (Black Sea) are shown in detail, and are reproduced by classical authors for a long time. To the east of the Pont, GM placed the Caucasian Mountains, and still farther to the east, the Hircanian (Caspian) Sea. In the extreme east, there emerged a designation of India, and in the western part a jut of the Iberian (Pyrenees) Peninsula.

Gemushovan – small salt lake, located to the south of Kyzylagach Bay, between Lenkoran City and Ilyicha Port, Azerbaijan.

General Fishing Regulations in Russia – draft elaborated by the Imperial Russian Society of Fish Breeding and Fishing and published in 1884. The Regulations comprised 58 articles that included all the best of the various local rules, foreign legislations, and proposals made by K.M. Baer and N.Ya. Danilevsky (“General Regulations of Fishing in the Lakes and Rivers of European Russia”, draft, 1875), O.A. Grimm, I.D. Kuznetsov, and other Russian ichthyologists. All water bodies of the country were broken into 9 districts, and each were placed in the charge of a state-designated fishing supervisor. Besides matters of fish conservation, the supervisor was also obliged to attend to fishing yield statistics, measures to increase fish populations, and develop fishing. He was to be assisted by local authorities, both police and public in supervising the fisheries. A ban on fishing during spawning was imposed; it was prohibited to collect caviar or stun fish with poisons, lime, or industrial or domestic wastes. When the population of a species shrank, a 3-year ban was imposed on fishing that particular species. A special section of the regulations dealt with regulation of reserve areas. Penal sanctions were adopted for those convicted of fish kills with poisons. The Regulations were reworked into the “Draft

General Fishing Charter” and were submitted to the State Duma of the 1st convocation. The Draft was discussed for 5 years and nearly 50 attempts to approve the document were made, yet it was never passed into law.

Geoherbun – small river that flows into the Caspian Sea 9 km east-northeast of the Tajan River delta, Iran. Mouth width is 15–20 m. The upstream course of the river is called the Neka River and runs through Neka Town and railway station, which is 20 km from the mouth. There is a fishery on the mouth’s right bank.

Gilan – one of the Circum-Caspian Iranian provinces (ostans). Stems from the word “ghely” – the name of an Iranian-language people who used to inhabit the south-western shore of the Caspian Sea and mentioned by Strabon in the first century C.E. Area – 14,709 km², population – 2.4 million people (2006 – 53% – rural, 42% – urban, 5% – farm population), with 16 Counties (Shahrestans), 45 towns, 2,690 villages. The province stayed independent until the sixteenth century and it still has its own language dialect Gilaki. Extends from the Caucasian mountains in the northwest of Iran to the western tip of Mazandaran Province and borders in the west on the Eastern Azerbaijan Province, and in the south on the Zanjan Province. Most of G.’s territory is occupied by the Elburz Mountains. The shoreline along the Caspian Sea widens at the mouth of the Sefid Rud River, where the population density is maximum. There are lowland areas here suitable for agriculture. The main city is Rasht. Major cities are Bandar-Anzali, Lahijan, Langrud, and Soumahe-Sara. The main river is the Sefid Rud, which flows out of the Sefid Rud Storage Reservoir on the border with the Zanjan Province and into the Caspian Sea. Climatically, this is the most humid part of Iran. G. is an important area for growing subtropical crops. Here, they cultivate rice, tea (at Lahijan and a staple crop for the province), olives, fruit trees, kenaf, tobacco, mulberry tree. Sericulture is rather common here. In G. offshore areas is fishing. The province is linked with the Azerbaijan Republic by highway and ferry service to Baku. There is a regular ferry to Olya Port (Astrakhan Region, Russia). Earthquakes, generally speaking, are common in Iran. One of the most devastating earthquakes occurred in G. on June 21, 1991, its epicenter being just north of Rasht City. Forty thousand people died.

Gilanians (Gilaki) – Iranian people related to Persians. Inhabits the narrow strip of the southwestern and southern shore of the Caspian Sea and adjacent mountainous areas of Iran. Population – 2.4 mln people (2000). Language – Gilaki, which belongs to the Iranian group of the Indo-European language family. Religion – Shiite Moslems.

Gilan Sea – see *Caspian Sea, Names*

Glauber’s Salt – named after the German chemist and physician I.R.Glauber (1604–1668). Occurs in nature as mirabilite mineral – hydrous sulfate of sodium. Readily soluble in water. Commercial fields are closely related to salt-bearing sections; these are represented by sheet deposits among sedimentary, mostly Tertiary and Quaternary deposits or salt brines and bottom salt layers and lenses in lakes and sea bays. GS is widely used in glass, chemical, and iron-and-steel industries. One of the largest GS fields is in Kara-Bogaz-Gol Bay, Caspian Sea, Turkmenistan.

Glinyanyi (“made of clay”) – an island in the Baku Archipelago, Azerbaijan. It is situated 5 km to the south of Cape Alyat and is of a rounded shape with a narrow spit in the west-southwest direction. G.’s area is 0.9 km², with a maximum length together with the spit of 8.5 km. The north-eastern raised part forms two summits, the western and eastern, which are the remains of an ancient crater. The volcano erupted in 1810, 1860, 1926, and 1934. A state sanctuary, it is a place where herring gulls nest.

Gmelin Samuel Gotlib (1745–1774) – traveler, natural scientist, member of Petersburg Academy of Sciences (from 1767). Graduated from Tübingen University, Doctor of Medicine (1763), Professor of Botany (1767), Chemistry (1772) of the same university. Arrived in Russia at the invitation of the Petersburg Academy of Sciences. In 1768–1774, managed the academic expeditions of Petersburg Academy of Sciences – Astrakhan, down the Don River basin, the Volga lower reaches, the Caucasus, the shore of the Caspian Sea to Persia. G. attributed fluctuations of the Caspian Sea level to the impact of climate. He wrote: “The Caspian Sea increment and decrement depend on the weather and winds; furthermore, the rivers flowing into the Caspian Sea are also subject to the said fluctuations.” From G.’s conclusions his views of the Caspian Sea water balance emanated logically: “According to the universal laws of nature, this sea loses nearly as much water in the form of evaporation as is put in by the known number of rivers flowing into it.” In 1770, G. drew up a plan of the Kura River delta showing a herring-bone pattern of the river arms, extending eastward and flowing into the sea. G.’s main work in Russian translation is “Travels in Russia for the Purpose of Studying Three Domains of Nature” (part 1–3, 1771–1785), which features a description of nature, oil fields of the Apsheron Peninsula, diverse information on history and ethnography (description of nations – Kalmyks, Astrakhan Tatars and others, of the cities Astrakhan, Derbent, Shemakha, Rasht). G. died in the captivity of the Kaitak Khan beyond the Samur River and is buried at Kayakent (Daghestan). In 1861, Academician B.A. Dorn installed a monument on his tomb.

Golestan – one of the Circum-Caspian provinces (ostans) in Iran. In 1997, Mazandaran Province was divided into Mazandaran proper and G. Occupies the extreme north-eastern part of Iran. In the south, G. borders on Semnan Province; in the west, on Mazandaran Province and is washed by the Caspian Sea; in the east, on Khorasan Province; and in the north on Turkmenistan. G.’s area is 20,200 km², and its population is 1.6 million people (2006) (57% – rural, 40% – urban, 3% – farm population), with 11 Counties (Shahrestans), 46 towns, 2,870 villages. Its major city is Gorgan, and sea port is Bandar Torkaman. Other major cities include Gonbad Kavoos, Aliabad-e-katul, Bandar Gaz, Minoo Dasht.

Golubyatnikov Dmitry Vasilievich (1866–1933) – Soviet geologist, one of the founding fathers of oil geology. In 1884, entered Petersburg College of Mines. Participated in the militant group of A. Oulyanov and was exiled to Siberia in 1887. In 1897, he returned from the exile and re-entered Petersburg College of Mines. Upon graduation (1900), worked at the Geological Committee. From 1922, he was

director of the “Glavgortop” trust and Chief Geologist of “Soyuzneft”, and from 1924 he was the Professor of the Moscow Mining Academy.

His scientific papers deal with oil geology and have to do with the studies of the Baku oil-bearing region. G. began studying geology and oil-bearing capacity of Apsheron Peninsula in 1903. He discovered (1908) large reserves of oil in the Surakhan Field (previously thought to possess gas deposits only). G. also discovered an oil field east of Surakhans. He made a correct estimate of some Baku oil fields as having good prospects for the future. G. was the first to provide a detailed description of the Apsheron Cainozoic rock mass, particularly the productive one. Proposed the application of logging when drilling for oil. Was the first to develop a procedure of drawing up structural geologic maps. Pointed out the need for studying hydrogeology of oil-bearing areas. A ship plying the waters of the Caspian Sea was named “Professor Golubyatnikov.”

Gorgan – until 1930, Astrabad Town, Astarabad – town in the north-east of Iran and the center of Golestan Province. Was so named, apparently, after the location which in Arab and Persian sources was referred to as Hircania or Jurjania – “country of wolves.” 241 thousand inhabitants (2005). Center of an important agricultural area (cotton, tobacco, rice, citrus fruit, and other crops). Has cotton-ginning and rice-hulling industries.

Gorgan, Gorgan Rud – river flowing into the Caspian Sea 8 km north-northwest of the town of Bandar-Torkaman. Major river on the southeastern shore of the Caspian Sea. The river source is the Aladag Mountains at the height of over 1,300 m. Its catchment area is 11,020 km². The river is 294 km long and has a mean discharge of 11 m³/s. The G. basin is characterized by asymmetry and left-side tributaries. The G. used to flow into the sea north of the existing delta and shaped up an internal multi-arm delta (area around 600 km²). As a result of sea level rising into the neo-Caspian transgression and the river having broken through south of the old channel, the existing delta of the G. began to take shape. At present, the G. delta is a single-arm, 20 km² in area, and surges out into the sea to a distance of 2 km. Mean annual runoff equals 0.49 km³, and suspended load runoff is 3.1 million ton. G.’s water turbidity is rather high due to its clay-aleurite banks and bed being easily washed out. The mouth’s offshore of the G. is rather shallow: the 10-m isobath passes at a distance of 15 km from the shore, and the underwater shore slope gradient to the depth of 10 m equals 0.007. Geomorphological features of the shore in this area, the wind regime, and the currents are conducive to sedimentation in the form of the Miankaleh Peninsula and of the island near it. On the bank of the river, near to the ruins of Gorgan Town, there is one of the most ancient dated monuments of moslem architecture in Iran – the Kabus Tower, built in 1006–1007.

Gorgan-Atrek Lowland – situated on the northeastern shore of the Iranian Caspian Sea, in the southeastern part of the Circum-Caspian Lowland. In the south, it is limited by the lower East Elburz Mountains. GAL is a narrow submontane plain

cut by the valleys of small rivers that are the left-side tributaries of the Gorgan River. It is structured by argillo-arenaceous sediments of ancient bays of the Caspian Sea and by debris cones from the mountains. The climate is dry and subtropical. There are numerous oases of varying area here, where agriculture is based strictly on irrigation. The Gorgan – Atrek interfluvium is heavily water-logged, the soils are salinized, and are virtually unsuitable for agricultural use.

Gorgan Bay – the only bay in the southeastern part of the Caspian Sea, Iran. Separated from the southeastern part of the Caspian Sea by Miankaleh Peninsula, the only one on the southern seashore. The length of the bay from the west to the east is 70 km, the width is from 4 to 12 km, and the bay area is 400 km². The southern and eastern shores of GB are low-lying. The southern shore is covered with thick vegetation and is cut by numerous rivulets flowing into the bay. GB is shallow. The average depth is 2–2.5 m, and the maximum is 4 m. Fluctuations of the sea level in GB are due to upsurges and downsurges and reach 0.6 m. Nearly 30 rivers flow into the bay.

Gorgan Strait – narrow inlet of Gorgan Bay located between the extremity of the Miankaleh Peninsula and shore of the land. Due to sedimentary buildup from Gorgan Bay, every year it is subjected to shallowing by 8–10 cm.

Gorodskoi Island – one of the four islands in the water area of Astrakhan Port on the Volga. Divides the Volga Channel into two arms, the Gorodskoi and the Trusovskiy, which are linked by bridges.

Granatka – coarse-grained crystalline salt used for salt curing of black pressed caviar.

Granule – black pressed caviar passed through caviar-sieve, but not yet salted; one fish egg; eggs.

Grease Ice – A thick soupy layer of ice specules and plates on the surface of a river or sea water, etc. The emergence of G.I. precedes the autumn ice drift and arrives when the water temperatures drops below zero.

Great Caucasian Wall, Derbent Wall – known as *Dag-Bari* – “mountain wall”. Most active in the sixth to eighth centuries by the Shah of Persia, Khosrov Anushirvan, to provide protection against east-to-west incursions of Northern nomads – from the Derbent to Tabasaran Mountains. After the decline and subsequent disintegration of the Khazar Kaganate, the strategic importance of the GCW waned. Gradually, the wall was ruined, and the local dwellers used its pieces for construction needs. The German traveler A.A. Olearius wrote in the first half of the seventeenth century that the wall stretched 150 miles. D.Kantemir, who had participated in the Persian campaign of Peter I, examined the mountain wall from

Kamakh Village and drew a map in which he indicated not only wall debris, but its towers and gates as well. Lieutenant-Colonel Kotsebu, a skilled cartographer, travelled farther than Kantemir, as far as Bilgadi Village in 1819–1820. A decade later, A.A.Bestuzhev-Marlinsky repeated the route. Ruins of the GCW that are still there are indicative of a high level of the art of fortification (military construction).

Great Eastern Sea – one of the most ancient records of the Caspian Sea, occurring in an inscription of the Assyrian King Adadnerari III (at the turn of the ninth and eighth centuries B.C.E.), reads: “The great sea of Sunrise, i.e. the Great Eastern Sea.” In the “History of Albania,” dated seventh to tenth centuries C.E., this name is used as a synonym for the Caspian Sea.

“Great Game” – an expression expressed by British novelists R. Kipling and F. Frezer to describe the nineteenth century rivalry between Russia, Britain, and Turkey for areas of influence in the Caucasus and Central Asia. Kipling wrote in his novel “Kim” (1902): “Now I shall go far and far into the north playing the Great Game.” To be more accurate, however, the expression “Great Game” was first introduced by British intelligence officer Captain Arthur Conolly who together with Captain Charles Stoddart was sentenced to beheading in 1842 in Bukhara. Before execution, he said that on the Asian expanses the “Great Game” was staged between Russia and Britain. This was the first “Great Game I”. In the late twentieth century, this expression was again applied in the struggle for influence over the oil and gas rich areas of the Caspian region.

Great Oil – term connected with the large volume of oil extracted in the principle stage of oilfield development.

Great Silk Road – a general name and collective symbol in the minds of the people (up to the sixteenth century) for caravan ways from China to West Asia via Central Asia that were essentially used to transport expensive wares such as silk between Europe and China. The name was given to the route by the German scholar, historian, and traveler F.Richthofen in his classic work, “China” (1877).

GSR is not so much a road, but, rather, a system of caravan trails between separate kingdoms and trading outposts in oases through Central Asia. Mongols were the first to travel the entire GSR route in the thirteenth century. The GSR began to take shape in the second century B.C.E. The travel of the Chinese Emperor U-Di’s envoy is generally regarded as the commencement of trade.

The GSR promoted trading china, furs, slaves (especially women), spices, perfumes, medicines, ivory, metal ware, horses of pedigree stock, precious stones, yet silk was the most valuable item.

Migration of religions also occurred along the GSR: Buddhism – starting in India, there are a number of Buddhist centers (during excavations in Termez, a whole cluster of Buddhist temples was discovered at a small village of Dalwerzin Tepe) up to towns in China, Japan, and Southeast Asia; Islam was wedged in between

India and China; and before that, Zoroastrianism. Concurrent with that, there was an active cultural exchange that included music, writing, religious rites, and services.

The GSR was used to conquer peoples. First, Alexander Makedonsky travelled the GSR. In the thirteenth century, Ghengis Khan followed suit, and at the end of the fourteenth century to early in the fifteenth century, Tamerlane used the GSR that passed through the Roman border town of Gierapol near the Euphrates, crossed Mesopotamia, then went in the direction of the Tigris River, on to Ecbatana and Media, skirted the Caspian Sea on the southern side, passed through Hekatompylus (Parthia's ancient capital), Marzia Antioch, Bactria and through Comed Mountains (these may be Alai and Trans Alai Ranges) before reaching the Tarim River basin. From there, the GSR led to the capital of sers (the Romans referred to silk makers and sellers as sers, i.e. silk people as the common name for silk was "sericum"). Such is the classical description of the GSR. The 23rd book of "History" by Ammianus Marcellinus, a fourth century author, specifically refers to "a great trading route which is used for promoting relations with sers."

During the time of rule of the Roman Emperor Avrelian (270–275 years) 1 pound of silk cost 1 pound of gold, while in the year 301, Emperor Diocletian's edict on the prices said that 1 pound of sterling gold was estimated to cost Dinaria 50,000, and 1 pound of purple-dyed raw silk cost Dinaria 150,000. A few centuries later, the high level of prices for silk still persisted in ancient Rome's successor – Byzantium.

The Silk Road originated at the ports of Assyria where caravans of traders' ships from Italy, Spain, and other Mediterranean countries used to call, and proceeded to the east, via the towns of Tir, Damascus, Anatolia, Baghdad, Hamadan, Ray, Nishapur, and on to Merve via Parthia. From that point, the route bifurcated into the southern and northern roads: many countries were eager to make sure the Road passed through their territories.

The southern route was in the direction of Balkh, Termez, Yarken, Khotam; after a few 1,000 km were covered, the route culminated in Ancy city and at that point it joined the northern route.

The northern route started at Merve and headed for Karshi, Bukhara, Samarkand, then reached Tashkent and went on to Inshin, Urumchi, Turfsan, Khami, Ansy, where the two merged and the GSR proceeded to Lanzhou, Xian and reached the coast of the Sea of Japan.

It should be noted that other silk roads existed, too. To Byzantium in ancient times, when Persians and Arabs restricted import of silk via the Middle East to the maximum extent possible, the trails of the North Caucasus functioned as the Silk Road. Italians had their own silk road in the thirteenth century: it began at Tane (near the Sea of Azov), proceeded on to Djutarkhan (Astrakhan) and then to Urgench, Otrar, Armalek (near Kulji) and on to Beijing.

As seafaring developed, the GSR began to decline. The GSR's historic-and-cultural space (as a common network of connecting links) started, by the end of the Middle Ages, to disintegrate into enclave spheres of the international community. The GSR ceased to exist as a through medium of Eurasia's international

communication. During the eighteenth and early in the nineteenth centuries there were from Peter I and Alexander I projects aimed at restoring these trails between the East and the West in particular.

In 1987, at the initiative of 10 countries, including the former Soviet Union, the 24th session of UNESCO General Assembly passed a resolution on organizing and holding from 1989–1997 a large-scale project titled “Integrated Use of the Great Silk Road: Dialog Options.”

In Nara Prefecture, Japan, the research center “Silk Road Study Center” was established in 1993. During the 1990s, there was an idea to restore the Great Silk Road as a transport route.

The latest archeological finds indicate that trade in Eurasia originated centuries earlier than was previously thought. Silk strands have been found in the hair of an Egyptian mummy, dating to circa the year 1000 B.C.E., long before the inception of regular trade along the Silk Road.

Great Sturgeon (*Huso huso*) – a species belonging to the great sturgeon (*huso*) genus, one of the biggest freshwater migratory fish. It has a spindle-shaped body. Its weight reaches 1 t, and its length is up to 4.2 m (at the age of 15). The world’s biggest specimen of G.S. (it is exhibited at the local museum in Astrakhan) was 4.26 m long and weighted 1,850 kg. The average weight of G.S. caught in the Volga is 70–80 kg. It is common everywhere in the Caspian.

G.S. runs for spawning mostly to the Volga, in smaller quantities to the Ural and Kura rivers, and quite rarely to the Terek River. In the past it ran up the Volga as far as Kalinin, and in the Kama it ran to its headwaters. In the Ural River, it lays eggs in the lower and middle reaches (nearby Uralsk). In the late eighteenth to early nineteenth centuries, large quantities of G.S. went to the Kura River, but now only dozens of the species do this. Along the Iranian coast of the Southern Caspian the sturgeons went to the Gorgan River.

At present, this fish goes up in the Volga as far as the Volgograd hydropower plant, and in the Kura River up to the Mingechar hydropower plant. G.S. may live up to 100 years. Most male fish that reach the Volga are 13–18 years of age, while those in the Kura River are 16–21 years. Female fish in the Caspian reach maturity at the age of 16–27. Female fertility, depending on size, varies from 0.5 to 5.0 million eggs. The Volga G.S., which is approximately 250–260 cm long, lays 937 thou eggs on average, while the Kura G.S. of the same size lays 686 thou eggs. G.S. is a predatory fish, even while still a fry in a river. In the sea, it feeds mainly on fish (herring, sprat, bullhead, and others). Even seal pups have been found in its stomach.

G.S. is a valuable fish. It produces the world’s best black caviar, which is very expensive. In the Volga and Kura rivers, sturgeon farming is practiced. Such farms let out into the sea about 10–17 million fries a year. G.S. is also used for making balyk, which is used for making canned food for cosmonauts.

In the wild, G.S. cross-breeds with starlet, starred sturgeon, bastard sturgeon, and sturgeon.



Great sturgeon (*Huso huso*) (http://www.turlenta.ru/uploads/posts/1151995948_beluga.jpg)

Greater Bogdo – a singular mountain in the north of the Circum-Caspian Lowland (Astrakhan Region) that rises to the south of Baskunchak Lake. Its height is 149 m. Its salt dome is overlain with limestones, clays, and sandstones, and karst phenomena (holes, niches, caves) are typical. The Lesser Bogdo Mountain (up to 34 m high) is located to the northeast of Baskunchak Lake.

Greater Kyzylagach Bay – a shallow water body that is part of Kyzylagach Bay located in the southeast of the Azeri coast of the Caspian Sea. In the east it is limited by the Kura Spit, in the west by the Sara Peninsula, and in the north by the mainland coast. The shores of the bay are low, rugged, and covered with high grass. Several spits protrude from the northern coast; the largest of them are Kabanya, Lebyazhya, and Krestovsky. In 1931, the bay area was 850 km², the volume of water was 3.5 km³, the average depth was 4.1 m, the coastline length was 116 km, the bay length was 40 km, and the width was 28 km. In 1965 these figures were 692 km², 1.0 km³, 1.4 m, 92 km, 24 km, 27 km, respectively. The bay is linked with

the sea only in its southwestern part via a strait between the southern ends of the Sara Peninsula and the Kura Spit.

As the Caspian water level has drops the saline waters of the bay are diluted with waters from the Lesser Kyzylagach Bay via a diversion canal. The water is supplied mostly in spring when fish shoals run for spawning into the Lesser Bay and partially in summer when the fries are let out. At all other times, the sluices are locked to accumulate sufficient quantities of water in the Lesser Bay. G.K.B. is influenced by the southwestern currents of the Caspian that are very important for the biological life of the bay because they create very active water exchange.

Greater and Lesser Turali, Turalinsky Lakes – located 22 km to the southeast of the city of Makhachkala and 2 km southward of the city of Kaspiysk in the Republic of Daghestan, G.T. is about 6 km long, 1.6 km wide, its area is about 4.8 km², and its depth is up to 1.2 m. L.T. is located to the west of G.T. It is 3 km long, up to 0.7 km wide, up to 1 m deep, and its area is approximately 1.4 km². It is of the lagoon-marine origin; it was formed by the separation from the Caspian Sea of small bays due to dropping of the latter's water levels. Its banks are flat, and the bed is silty; it is recharged by precipitations and ground waters. These lakes were once called "artificial Kara-Bugaz," and in the 1920s the USSR Academy of Sciences tested a new technology accelerating sedimentation of mirabilite from water here. A fish farm is located here.

Griboedov Alexander Sergeevich (1795–1829) – great Russian writer and diplomat. In 1817, joined civil service at the Board of Foreign Affairs. In 1818–1821, he was Secretary of the Russian Diplomatic Mission in Persia. Being the chief of the Caucasus Governor-General's Chancery, G. stood for rapprochement between Russia and Persia, realizing the importance of cultural and trade relations between the two. During the Russian-Persian war of 1826–1828, he participated in diplomatic talks with the government of Persia and in elaborating the terms of the 1828 Turkmanchai peace accord. In May of 1828, G. was sent to Persia to hold the position of a resident minister. On January 30, 1829, a mob of Persian fanatics organized a pogrom of the Russian mission in Tehran. The mission's entire personnel, including G., were butchered savagely. That same year, the celebrated diamond "Shah" was delivered to Petersburg as ransom for G.'s violent death.

Griva ("mane") – spit, overgrown with reed and grass.

Grokhotka – thread sieve, pulled over a wooden frame without trimmed edges, where roe is extracted from sturgeons (except sterlet) by grating through screen openings. Eggs fall down in a bowel on which the G. is placed, while roe film remains on the sieve.

Gryada ("ridge") – a stony spit or cape of silt jutting out into a river channel.

GUAM – abbreviation for the regional union of Georgia, Ukraine, Azerbaijan and Moldova. At the end of 1997, in Strassbourg, France, at the EU summit, the four

countries established the union to facilitate economic objectives, in particular implementing the TRASECA project. At the end of April of 1999, in Washington, DC, USA, an agreement of accession to the union was signed by Uzbekistan, since a significant segment of the Great Silk Road runs over its territory. At the same time, it was believed that certain mutual assistance would be arranged to provide security, which clearly emanated from a joint document drafted by the countries' participant to GUAM regarding the twenty-first century security model, which they had presented at the 1997 permanent OSCE Council meeting in Vienna. The primary goals of GUAM are matters of territorial integrity and regional cooperation of transportation corridors.

Gubkin Ivan Mikhailovich (1871–1939) – prominent Soviet geologist. Academician (from 1929). Honored expert in science and engineering. From 1910, worked at the Geological Committee. From 1917 to 1918, studied the oil industry in the USA, and from 1920 was Professor. In 1922, became rector of Moscow Mining Academy, and from 1930 was rector and head of the chair of geology of oil fields at Moscow Oil Institute. Head of USSR Geological Service (from 1931). From 1930 to 1936, he was the Chairman of the Board for the Study of Productive Forces of USSR Academy of Sciences. Vice-President of the USSR Academy of Sciences (from 1936), Chairman of the Azerbaijan Branch of USSR Academy of Sciences (1937).

Founding father of Soviet oil geology. In 1935, he advanced an idea of exploring marine areas on the Caspian Sea. Headed geological explorations in the Caucasus, especially around the Kursk Magnetic Anomaly, Volga-Ural Oil Region, and Orsk-Khalilov Area. Provided a scientific foundation for the relationship between mud volcanoes and oil fields. Authored works on oil origin, geology, and conditions of oil pool and field formation, and on methods of oil field prospecting. Main works: “The Oil Doctrine” (1932); “World Oil Fields” (1934, in assoc. with S.P.Kiselev); “Ural-Volga Oil-Bearing Region” (Second Baku)” (1940); “Selected Works” (v.1–2, 1950–1956). From 1940 to 1950, the ship “Akademik Gubkin” plied the Caspian Sea. Moscow University of Oil and Gas was named after Gubkin as was a city in Belgorod Region. USSR Academy of Sciences established the I.M.Gubkin Prize.

Gubonin Petr Ionovich (1825–1894) – prominent entrepreneur and public figure. A serf peasant by birth who belonged to landowner D.G.Bibikov. In 1858, he was granted a manumission by his landowner, and he moved to Moscow where he obtained registration as a 3rd guild merchant. He was an honorary citizen (1868), nobleman (1872), active councilor of state (1875), privy councilor (1885). Owner of an estate (around 36 thou dessatines in various gubernias of European Russia). Made a fortune on contractor's business, including the construction of the Moscow-Brest Road. One of the active promoters of joint-stock railway companies in late 1860s-first half of the 1870s. Began his entrepreneurial career with contracts for the building of stone bridges on the state Moscow-Kursk Railway, and in 1866 obtained a contract for the construction of the Orel-Vitebsk Railway (completed in 1868). With his participation, Gryaze-Tsaritsino (1871),

Lozovaya-Sevastopol (1875), Ural-Gornozavodskaya (Perm-Yekaterinburg, 1878), and other railways were built. G. was a director on a number of the Boards of railway companies, among them being Orenburg, Urals, and Fastov Railways. He was the founder and builder of Petersburg (in ass. with S.D.Bashmakov) and Moscow Horse-Driven Railways. In association with V.A.Kokorev, established Volzhsko-Kamsky Bank (1870), Northern Insurance Company and Stock of Goods with Issue of Warrants (1872), Baku Oil Company (1873).

Guilgulchai Long Wall – also referred to as Shirvan Wall. The ruins of this once grandiose fortification structure stretches from Chirakh-Kala Fortress to the Caspian Sea over 30 km. Located to the north of Besh-Barmak fortifications at a point where the Guilgulchai River exits the narrow pass onto the plain in Azerbaijan. The lines of “long walls” were set up by Sassanide Kings at locations most convenient from the standpoint of defense of the Circum-Caspian Road they controlled.

(The) Gukasovs – brothers Pavel Osipovich G. (1858–unknown), Abram Osipovich G. (1872–1969), and Arshak Osipovich G. were entrepreneurs in Baku Oil Industry. Pavel G. from 1878 – Manager of the Plant “Caspian Partnership” (an oil firm in Baku). Member on the boards of a number of companies (“Caspian Pipeline”, “Electric Power” in Baku, and others). In 1890–1906 and 1915–1917, he was the Chairman of the Council of Congresses of Baku Oil Industrialists.

Abram G. – Doctor of Natural Science (specialist in geology), Doctor of Philosophy (1898). From 1899, he represented “Caspian Partnership” in Europe (settled in London). In 1907, established a ship-building company named “Bolting Trading & Co” in Britain.

The brothers G. cooperated with the Nobel brothers and Rothschild brothers; in so doing, however, they sought to seize sales markets of their own, acting in concert with another Baku-based leading Armenian oil industrialist, A.I. Mantashev. In 1902, “Caspian Partnership” and “Mantashev A.I. &Co.” set up in Britain a joint firm called “Homelight Oil Co.,” which, in turn, established relations of partnership with the British Company “British Petroleum.” On Russia’s domestic market, G. were also doing their best to overcome the monopoly of the Nobel and Rothschild brothers. Having ceded the sole right of fuel oil sales in Russia to “Nobmazut” Company in 1902, “Caspian Partnership” established its own network for the sale of other oil products in the country.

Relations between the administration of “Caspian Partnership” and the workers were the responsibility of the third Gukasov brother, Arshak G. (in 1905–1906 – Chairman of the Council of Congresses of Baku Oil Industrialists). He opposed the industrial action movement among the workers. In 1905–1906, the G. brothers participated in organizing armed suppression of mass strikes that gripped the oil enterprises in Baku area.

In 1906, Pavel G. was elected to the state Council as a representative of the industrial curia, whereupon he moved to Petersburg and became a member of the Board of the Russian Bank for Trade and Industry (from 1916, Chairman of the Board). He was elected a member of the Council of Congresses of Representatives

of Industry and Trade. In 1912, together with A.I.Putilov and S.G.Lianozov and some other bankers and industrialists, Pavel G. established a new international oil monopoly called “Russian General Oil Corporation” to compete with the leading exporters of oil products from Russia – the Nobel brothers and G. Deterding.

After 1917, the G. brothers emigrated. Arshak G. set up a ship-building company for crude carriers in Paris (21 tankers were built at the company’s shipyards). Also, he established the Gukasov Brothers Foundation (Gukasovs).

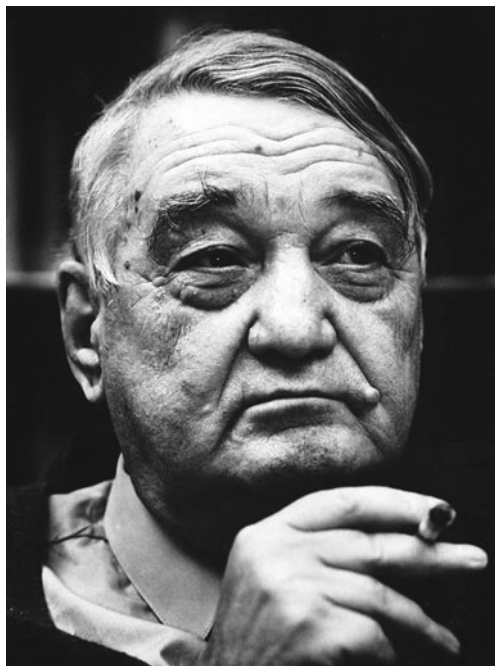
Gul Kasum Kyazim Ogly (1909–1972) – geographer, oceanographer, Doctor of Geography (from 1956), professor, First director of Baku Merchant Marine Academy, Master Mariner, Chairman of the Scientific Council on Problems of the Caspian Sea, Head of the Caspian Sea Sector of the Institute of Geography of AzSSR Academy of Sciences, and President of AzSSR Geographic Society. He studied the Caspian Sea hydrology as well as physical geography of AzSSR and Daghestan ASSR. Among his works were the fundamental monograph “The Caspian Sea” (1956), an Azerbaijani physiography text-book for secondary schools. The sea-going ferry “Professor Gul” was named in his honor.

Gulistan Contract – see “*Contract of the Century*”

Gulistan Peace, Gulistan Peace Treaty of 1813 – peace treaty between the Russian Empire and Persia that put an end to the Russian-Persian War of 1804–1813. Concluded on October 12 (24), 1813 in Gulistan Stow on the Zeive River, Karabakh (later Gulustan) Azerbaijan. GP included 11 public articles and a separate (secret) act. Persia recognized Art. 3, the accession to Russia of Karabakh, Gandzha, Shekin, Shirvan, Derbent, Kubin, Baku, Talysh Khanates, Daghestan, Georgia with Shuragel Province, Imeretia, Guria, Mengrelia and Abkhazia. Russia was granted the sole right to maintain a Navy on the Caspian Sea (Art. 5). Russian and Persian merchants were allowed to trade freely on the territory of both the states. The subjects of two countries were entitled to trade on the territory of the other on the basis of mutual interest and equality; freedom of merchant shipping on the Caspian Sea was proclaimed. On behalf of Russia the treaty was signed by Lieutenant-General N.F.Rtishchev. The basic provisions of GP were included in the Turkmanchai Peace of 1828.

Gumilev Lev Nikolaevich (1912–1992) – historian, geographer, Doctor of Geography (1974) and History (1981). Son of the poets N.S.Gumilev and A.A.Akhmatova. Was subjected to repressions in 1930–1950. Developed a theory of mankind and ethnoses as biosocial categories and investigated the bioenergy dominant of ethnogenesis (passionarity). From 1959–1960 to 1960–1963, headed Astrakhan archeological expeditions of the Hermitage in search of the Turk Khazar Kaganate. Examined the causes of Caspian Sea level fluctuations, which was detailed in the article, “The Background of Caspian Sea Level Fluctuations over the Period of 2000 Years (from the fourth century B.C.E. to sixteenth century C.E.)” (1980) and in the books “Discovery of Khazaria” (1966), “Millennium Around the Caspian Sea” (1991), and “Ancient Russia and the Great Steppe” (1992). The book

“Millennium Around the Caspian Sea” (from the third century B.C.E. to the twelfth century C.E.) is the concluding part of G.’s treatise, “Ethnogenesis and Earth’s Biosphere” – at the end of the 1970 s, it transformed history as science into a science dealing with ethnic history, with ethnogenesis.



Gumilev L.N. (http://www.blowup-2006.narod.ru/2006/summer/jule/2006_07_22_gumilev_02.jpg&imgrefurl)

Guneshli – one of the oil largest fields on the Azerbaijan shelf of the Caspian Sea. Part of the “Contract of the Century”. Oil recovery has been going on since 1980 in the shallow-water segment of the field. G. provides 64–65% of all oil extracted in Azerbaijan. By the end of the twentieth century, more than 60 million tons of oil had been recovered. According to forecasts, the remaining reserves may equal 80–115 million ton. The initial recoverable reserves are put at 175 million ton of oil. There are 12 deep stationary platforms set up at the field at present. The recovery stock has 152 oil wells, of which 133 are in operation.

Guriev – see *Atyrau*

(The) Gurievs – merchant clan of the seventeenth century. Descended from affluent posad people of Yaroslavl. The forefather was Gurii Nazaryev. His brother, Druzhina, organized a rebuff to P.Sapega and militant groups of Tushintsy under the command of Lzhedmitry II early in the seventeenth century. After Mikhail Fedorovich was ordained (1613), the brothers were granted the status of guests and soon occupied a prominent position among Moscow merchants. The brothers made

their fortune on trade with Siberian cities, Kazan, Astrakhan, and foreign lands. In 1640, the brothers launched large fisheries near to the Yaik (Ural) River mouth with a workforce of several hundred hands. Gurii's son Mikhail and nephew Ivan collected customs duties in Arkhangelsk, buying grain and caviar in Nizhny Novgorod and Astrakhan. To protect the fisheries from robbers, Mikhail Gurievich G. and his brothers built a fortified wooden prison in 1640, then a stone fortress. The fact that G. established themselves firmly on the Yaik River made the free Cossacks discontented: they were eager to destroy the fortress. In 1645, the Government, interested in developing the Circum-Caspian lands, permitted G. to build a town of stone and made the fisheries rent-exempt for 7 years. The building of Guriev Town dragged on for several years and cost the brothers around 290 thou Rbls. which ruined them once and for all. Early in the 1670s, the government placed the fisheries and the town under the command of the Great Treasury.

Guriev Region – see *Atyrau Region*

Guriev Trough – depression in the relief of the North Caspian seabed marked by B.A.Apollo in 1956.

Gurkan (Gurkanian) Sea – see *Caspian Sea, Names*

H

Halophytes (from Gr. *hals* – “salt” and *phytou* – “plant”) – plants adapted to living on salinized soils; salt-resistant plants. Rather resistant to high concentrations of salts, some of them are capable of developing an enormous osmotic pressure. H. also include part of bacteria as well as all algae of the seas and oceans. H. are quite common in deserts and semi-deserts and on the shores of seas and oceans. H. are used as biological improvers to combat oil pollution.

Hazar Transgression (named after Hazars, the people who inhabited the lower reaches of the Volga and Don) – Middle Quaternary (100–300 thousand years ago) transgression of the Caspian Sea made up of 2 phases. Thickness of its deposits is 20–50 m.

Heraz (Haraz) – a river in the eastern part of the Caspian coast in Iran. It is the second largest river by water availability and flows over the Mazandaran Province. It originates on the western slopes of the Damavand Mountain, the highest peak of which is Elburz. In its upper and middle reaches, it is a typical mountain river. In the lower reaches, H. acquires a more tranquil flow and at its inflow into the Caspian, it forms a multi-armed delta. Its watershed area is 5,220 km², its length is 158 km, and its average slope is 19%. The average flow is from 14 to 34 m³/s. The delta area is 315 km².

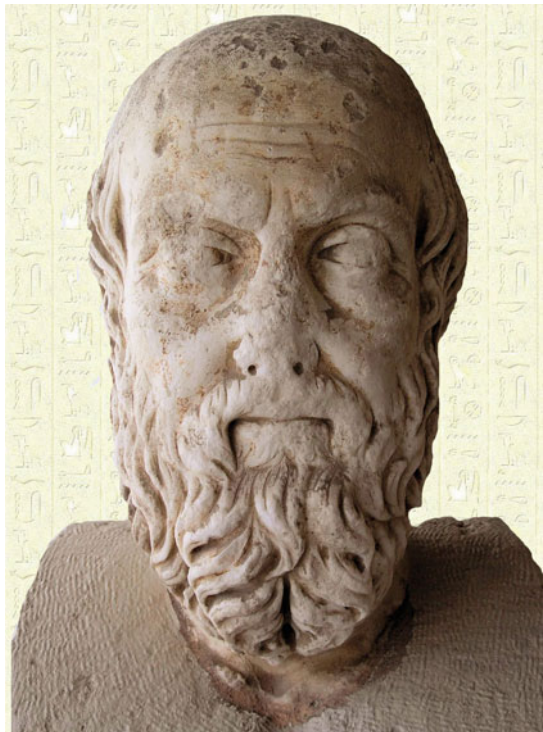
Herd-in Fishing – fish catching with a net by surrounding a stock of fishes that are among the plants near the shore (bank).

Herodot (circa 484 B.C.E. – circa 425 B.C.E.) (Gr. Herodotus – “of Halicarnas”) – historian of ancient Greece and one of the first scholar-travelers. Undertook lengthy travels (between 455 and 444 years B.C.E.) and had profound knowledge of the coastal areas of Asia Minor with adjoining islands, part of Asia Minor, Egypt, Kyrenia, Syrian- Phynikian Coast with Cyprus, the Pont as well as Gellespont, Phrakya, and Macaedonia.

His visit to Athens (mid-40s of the fifth century B.C.E. – friendship with Pericles and Sophocles, his bend towards sophistication and natural science, visits to Greek

cities) left a deep impression on his education. In 444–443 B.C.E., H. participated in colonizing Furry (South Italy).

H.'s legacy is the "Presentation of Events" ("Histories Apodexis") or the "History" in 9 books. H. followed the history of relations between the ancient oriental despotisms (Asia) and Greek slave states (Europe) that culminated in Greek-Persian wars. H. gave the first description of the life and culture of the Scyths. His "History" contains a lot of geographic information enabling the reader to appreciate his broad spatial outlook. Cicero bestowed on H. an honorable title of Pater Historiae ("father of history"). Yet, it would be just as appropriate to call him "father of geography." Just like Hekatei of Miletus, H. regards the Caspian Sea as an enclosed water body, albeit extended from the west to the east more than from the north to the south. H. knew that the Caspian Sea is a lake. "The Caspian Sea is different, special, having in length 15 days of sailing for a military ship, and in width, where the sea is widest, 8 days. There are the Caucasus stretching along the western shore of this sea, the most extensive of the mountains volume-wise and the highest one. . . In the east, the sea is adjoined by a boundless plain most of which is inhabited by the Massagets." The main and most abundant material on the Caspian Sea area is placed by H. in Book I, in his "Cyrus History," collected during his travel to Babylon, as well as in Book III, "Administrative Division of Persia into Satrapies."



Herodot (<http://antikforever.com/Dico/auteurs/images/herodote02.jpg>)

Herrings (*Clupeidae*) – family of bony fish, order of the herring-like. There is no side line on the body, but herrings of *Alosa* genus feature a system of lateral canals on the sides of the head. The belly is rounded or compressed, tail fin with an excision. The fin has no rigid arms. The bony spondyluses have a hole in the center. These are mostly fries and small fishes under 35–45 cm, only some anadromous herrings may be as large 75 cm in length.

There are 18 species and subspecies of H. in the Caspian Sea, including Caspian common kilka (*Clupeonella delicatula caspia*), anchovy kilka (*Clupeonella engrauliformis*), big-eyed kilka (*Clupeonella grimmeri*), big-eyed chad (*Alosa saposchnikovi*), round-headed chad (*Alosa sphaerocephala*), Caspian chad (*Alosa caspia caspia*), Enzeli, Sari chad (*Alosa caspia knipowitschi*), Astrabad chad (*Alosa caspia persica*), Dolgin herring (*Alosa brashnik-ovi brashnikovi*), Agrakhan herring (*Alosa brash-n ikovi agrachanica*), Sari herring (*Alosa brashnikovi saren-sis*), oriental herring (*Alosa branshnik-ovi orientalis*), fall or big-eyed herring (*Alosa branshnikovi autumnalis*), Gasan-Kuli herring or Kisselewitsch herring (*Alosa brashnikovi kisselewitschi*), Krasnovodsk herring (*Alosa brashnikovi nirchi*), white-headed or Astrabad herring (*Alosa brashnikovi grimmeri*), Volga herring (*Alosa kessleri volgensis*), and black-backed shad (*Alosa kessleri kessleri*).

High Seas – water outside of territorial waters. H.S. is used by all states for navigation, fishing, etc.

High Water – a period of spring floods in rivers caused by intensive melting of snow accumulated during winter within the watershed area. H.W. is characterized by quick augmentation of the water flow, rise of the water level and increase of the river flow rate. A lot of sediments are transported with flood waters, and the most essential transformations of riverbeds composed of light moving soils are observed. During H.W., the greater part of the annual flow passes along the river. In steppe regions and also in rivers with small watershed basins, about 70–80% or more of the annual flow pass during H.W. periods.

Hircania (Hyrcania) – stems from the Aryan word *Verkana* – “country of wolves.” It is possible that the wooded Mazandaran segment of the Caspian shore that used to be part of Caspiana was described by the local dwellers as the “wolves’ own”; subsequently, this name was inherited by the people who inhabited the area. The classical name of the ancient Iranian fertile area Verkana (later – Gurkan, Jurgan, and contemp. Gorgan) located southeast of the Caspian (Hyrcanian) Sea. In the south, H. is separated from the rest of Iran by high mountains with the mountain pass *Portas Caspiae* (Caspian Gate).

Hircanian (Hyrcanian) Basin – freshened sea basin that existed where there used to be the valley of the Manych River at the beginning of the Late Pleistocene. Is compared with the late phase of Karangat Basin that used to occupy the depression of the Black Sea.

Hircanian (Hyrcanian) Sea – ancient name of the Caspian Sea. Preserved as the name of the Circum-Caspian area Hyrcania, which, according to V.V. Bartold, “attained a higher level of cultural development than other areas, hence its name was given to the Caspian Sea.” In “Earth Description” of Hekatei of Miletus, HS was part of the North Ocean with which it was linked via a strait. This strait is believed to have been the Circum-Volga Lowland that was filled with flood waters of the Caspian Sea.

Hulzum Sea – another name of the Caspian Sea as per the notes made by Don Juan of Persia (Don Juan Oruj-bek Baiaty), an eminent Persian (1560–1604). The sea name was then placed on the maps drawn by the European scholars A.A. Olearius (1647) and R. Ottens (1722–1723).

Humboldt Alexander Friedrich (1769–1859) – great naturalist, natural scientist, a pioneer researcher of the Earth. In 1789–1790, studied at Gottingen University, and in 1790, at the age of 20, accompanied Georg Forster (natural scientist, explorer who traveled with J. Cook) in his travel across Belgium, Holland, England, and France. Forster awoke in H. a profound interest in observations of nature that determined his entire subsequent life. Later, he studied at the Trade Academy in Hamburg, then he was a disciple of the outstanding geologist A.G. Werner in Frieberg, and from 1792 to 1797, he became the ober-bergmeister in the then Prussian Ansbach-Bayreuth, Franconia. Explorer of the hinterlands of South America (1799–1804) in association with the French botanist, E. Bonplan, H. determined the water resources system of South America (the Orinoko and Amazon rivers) and also travelled to Cuba, Columbia, Mexico, and Ecuador. As a result of these travels, H. not only initiated scientific exploration of South America, but outlined new vistas and methods of scientific research in the field of geography and natural science in general. In 1829, together with S. Erenberg, and T. Rose, thanks to sponsorship of the Russian Minister of Finance’s E.F. Kankrin, H. travelled to the Caspian Sea, the Urals, and Altai. When at Orenburg, H. wore to the Minister: “A cannot feast my eyes on your country enough! I can’t die before I see the Caspian Sea.” And, later, he added: “Tomorrow we’ll sail toward the Volga mouth on board the steamer and for 8 days, until October 9, we shall be determining the Caspian Sea level and be gathering sea foods. . .” (from the letter to Count E. Kankrin dated 1/13 October, 1829).

H. described his first journey in his extensive work, “Travel to the Equinoctial Regions of the New World in 1799–1804” in 6 parts, published in 1805–1829 in 20 books (in Russian translation, in 3 volumes, published: v.1, Moscow, 1963 and v.2, Moscow, 1964). The results of the Russian travel are set out in the work “Mineralogical and Geognostic Journey in the Urals, Altai, and to the Caspian Sea” (2nd v., 1837–1842) – in the Russian translation “Travel of Baron A. Humboldt in Siberia and the Caspian Sea,” published in Petersburg in 1837.

H. described the study of the entire nature and environment as an integral whole in a geographical work titled “Cosmos. An Experience of Describing Physical World” (published in Russia in 5 v. in Petersburg in 1848–1863).

Humboldt A.F.
 (<http://vivovoco.rsl.ru/VV/JOURNAL/VRAN/HUMBOLDT.JPG>)



Hummock – a hill, small knoll, mound. Any flat, sandy, sometimes lengthy hill in the Volga steppes and on the coast of the Caspian Sea. Hillocks are hummocky islands in the Volga delta.

Hummocks – mounds of crushed ice in the sea, formed as a result of ice and ice fields thrust on one another during strong wave and tides. They are distinguished by hummocky mounds of small floes not welded to form a single piece, and H. that are frozen together into a mass several meters high. In severe winters around Makhachkala, when winds are long-lasting and blow fiercely to the southeast, crushed ice may form a solid mass of 5–6 m in thickness. The Astrakhan roads and Chechen Island area are known to exhibit hummocks. The same is true for Tyulenii Island, where ice hummocks as large as 3–6 m are observed. In the northern part of the Caspian Sea, H. are often referred to as “khraps”.

Hung Fish – salted and sun-dried balyk and belly of sheefish and other “red” fish.

Hydrological Regime of the Rivers – variation of the rate of flow and water levels in rivers during characteristic periods of the life of rivers: flood, low-water season,

freeze-up, and dependence of flow rates and water levels on hydrometeorological factors.

Hydrometeorological Service of the Caspian Sea – set up in 1911 by the Trading Ports Department. Comprised 7 hydrometeorological stations (HMS) and the central station based at Petrovsk-Port (Makhachkala). By the end of 1927, the hydrometeorological network included already 16 stations and one instrumentation gauge; by the early 1930s, on the Caspian Sea coast, there were 12 HMS stations operating under the naval command alone. In 1923, a meeting of TSUMOR hydromet service decided to make ships and boats available to the Caspian Sea Hydromet service for carrying out hydrological and meteorological observations. Subsequently, the HMS of the Caspian Service was converted to HMS departments of individual republics.

Hydropower System – a complex of hydrotechnical works integrated by location and conditions of joint operation. The composition of works making up a H.S. is determined by the nature of use of the water flow. If the water flow is used for transportation and power generation, the H.S. includes a power plant, navigation lock with an outport, an overflow weir, an earth dam; sometimes, these structures are supplemented with a fishway or fish hoists and an intake of water works of the irrigation system. If a river is used for transportation only, a H.S. comprises a navigation dam, navigation lock, and an earth dam.

Hydrotechnical Structures – engineering works intended for water resources use or for combating harmful impacts of water-related hazards (flood protection, river banks, and sea shore erosion, etc.). HS make it possible to control river discharge distribution time-wise, vary river water level, rate of flow and direction, change silting regimes, ice drift conditions, etc. HS includes: water-retaining structures (e.g. dams – for storage reservoirs, for water diversion, navigation dams and dams for bank protection and river-training works); water-conveyance structures (aqueducts, canals, inverted siphons); water intake structures (intakes); abstraction intakes (intakes and water spillway structures); transport works (navigation locks, boat lifts, quays, dockage facilities, sheds and slips, and breakwaters); log sluices, etc.

I

Ibn-Battuta (Batuta), Abu Abdulla Mohammad (1304–1377) – outstanding Arab traveler. Born in Tangier on February 24, 1304, died in Fes, Morocco, in 1377. His first big voyage, which lasted 24 years (1325–1349), had to do with pilgrimage to Mecca, which he visited 3 times. After his third journey to Mecca, I.-B. headed via Egypt, Syria, and Asia Minor for and reached the Crimea, then moved to Astrakhan and over the Volga ice to the Mongolian residence Sarai (downstream of the present-day Volgograd). Following his journey to Constantinople, I.-B. returned to Sarai and traveled along the Volga upstream as far as Bulgar (downstream of the Kama mouth). I.-B. never realized his plan to get from Bulgar to the Pechora Region, which was rich in furs in the extreme North and had been visited by Arab merchants earlier. He traveled down the northern shore of the Caspian Sea to Khiva, Ferghana, and Bukhara and then on via Khorasan and Afghanistan to India which was under Muslim domination at the time. He spent several years in Delhi (from 1333) as a kadi (shariah judge). In 1342, the Sultan of Delhi sent I.-B. to China as an ambassador. In 1347, he arrived in Khafar, northeastern Arabia, then traveled to Egypt via Persia, Mesopotamia, Syria, and Palestine, and went on a pilgrimage to Mecca for the fourth time. Early in November of 1349, he arrived in Fes. In 1352, commissioned by the Sultan, he set out to Sudan from Morocco. In 1352, after a 2-year travel, he returned to Fes. Here, he dictated his extensive report on the journey. The report was completed in 1355 and made many doubt its content was true just as Marco Polo's story had been doubted earlier; however, the report is a good guide on the economy and public life of countries where he traveled. I.-B. probably saw three times as many foreign countries as Marco Polo.

In Europe, this report came to be known (in fragments only) as late as in the nineteenth century. At first, the Arabic text with a French translation titled "Ibn-Batuta's Travels" was published in 4 volumes in 1853–1858; the 3rd edition was released in 1893 ("Voyages d'Ibn Batoutat"), edited by Defremerie and Sanguinetti. Later, the German and British editions were released (in 1911 and 1929, respectively).

Ice Conditions of the Caspian Sea – the Caspian Sea is a partly freezing one. In its middle part, the ice area is not too large, and during mild winters, there is no ice at all. The North Caspian freezes every year with a significant part of the sea covered with ice. Ice boundaries are fringed by a 20–30 km wide strip of floating

ice. The southern boundary of median ice proliferation passes approximately along the slope in the North Caspian and assumes the shape of a northward convex arch running from Chechen Island, Daghestan to Kulaly Island and on to Tyub-Karagan Cape, Kazakhstan. When winters are temperate, ice formation commences in mid-November in the shallow northeastern areas of the sea, and by the end of the month the ice spreads along the entire northern coast. Early in January, the whole of the North Caspian water area is covered with ice. In the Middle Caspian, in December, the ice forms in shallow-water bights and bays of the eastern coast, and in January, forms around Makhachkala. When winters are mild, the ice forms in offshore areas later than in temperate winters, usually 10–20 days later, and at high seas, even a month or more later. When winters are very warm, the ice covers offshore areas and sea water areas with depths of under 3 m only. During severe winters, ice formation in the North Caspian occurs 20–30 days earlier than usual. In the Middle Caspian near the eastern shore, the ice may form at the end of October and into November, and near the western shore, it forms at the end of November or early in December.

Ice in the North Caspian may, as a rule, be broken and set in anew. Hummocks are formed at the boundary between ice and drifting ice. In the North Caspian, maximum thickness of ice is observed in the northeast in January (40–50 cm), and in the western part and in the Volga offshore toward the end of the winter, in February (20–30 cm). In very severe winters, the thickness of ice in those areas reaches 80–90 and 60–70 cm, respectively. The hummocks are usually 1–1.5 m high, with their height sometimes reaching 2–3 m.

During severe winters, cases of drifting ice being driven by the wind far to the south along the western seashore as far as Apsheron Peninsula have been reported. Under such extreme conditions, the ice blocks the approach to the port of Makhachkala and is likely to threaten marine hydrotechnical constructions. As early as from the second half of February, rapid destruction of the ice cover begins. First and foremost, the coastal areas of the Middle Caspian become ice-free, then the northwestern part of the sea opens, followed by areas of the North Caspian, and, finally, the extreme northeast. The sea is completely free of the ice by the end of March – early April. During mild winters, the northern part of the sea is cleared of the ice as early as in mid-March, while in severe winters the process of ice cover destruction is slow, and the dates of complete ice clearing are shifted to the 2nd week of April.

The maximum length of the ice season averages 120–140 days and is observed in the northeastern areas of the sea and in the eastern part of the Volga offshore. In water areas with depths of 2–5 m, the ice remains for 80–90 days, near Tyulenii and Kulaly Islands for around 70 days, and near Cape Tyub-Karagan for 50–60 days. In mild winters, the number of icy days is significantly lower: 100–130 in the northeastern area of the sea, 50–100 in the Volga offshore, and only 15–20 near Tyulenii and Kulaly Islands and Cape Tyub-Karagan. In severe winters, the length of the ice season in the northeastern Caspian can reach 140–170 days, near Tyub-Karagan Cape up to 100, and in the other areas of the North Caspian from 100 to 150 days.

A study of physico-chemical properties of ice in the North Caspian indicates that the temperature of ice surface layers is usually lower than that of the air by 1–3°C, but when it gets colder, the difference increases. Ice salinity fluctuates between 0.01 and 4.6‰, averaging around 1‰. The ice contains an increased (2–5 times as great) amount of phosphates and nitrates compared with ice-contacting water. As the ice melts, the North Caspian waters is substantially enriched with these nutrients.

Ice Jam – an accumulation in a river or canal of large masses of shuga, floating anchor ice, and/or small ice fragments that results in an abrupt rise of the water level upstream of the ice jam and reduced water discharge downstream of the ice jam. Produced in autumn. During freeze-up, sometimes produced in winter downstream of the non-freezeable segment of a water course.

Ichthyofauna of the Caspian Sea – in terms of the number of fish species, the Caspian is inferior to open seas. ICS and of river deltas features 126 species and subspecies belonging to 17 families: lampreys, sturgeons, herrings, salmons, pickerels, carps, loaches, catfishes, cods, pipefishes, *Poecilidae*, mullets, hardyheads, perches, and gobies. Judging from the number of forms (species and subspecies), the dominant fish are the herrings. Carps and gobies, taken together, amount to around 75% of all fish in the water body. Habitat-wise (in the sea and in rivers, in the sea only, and in the rivers only), the fish species are distributed rather uniformly, with a certain prevalence of species that occur both in the sea and in the rivers. Of the fish that inhabit the sea only, herrings and gobies prevail, while of those living in the rivers only, carps dominate.

The contemporary composition of Caspian ichthyofauna is a reflection of the complex background of the sea, which is now associated with the Black Sea. The most ancient representatives of the Caspian ichthyofauna emerged in the brackish Pontian Sea-lake 5–7 million years. These constitute a group of brackish-water loving (rare) fish that adapted to habitation in the brackish Caspian water. They include herrings and gobies.

A rather sizeable part of the Caspian Sea ichthyofauna comprises fish of fresh-water origin. These include all sturgeons, carps, pickerels, catfishes, loaches, sticklebacks, pike-perch, perch, and ruff. There are few true sea fishes in the Caspian Sea: hardyhead, great pipefish, and two acclimatized species of mullet.

The peculiarity of ICS is the large number of endemics (i.e. forms peculiar to this water body only). Endemic species and subspecies belong to the families of herrings and gobies. Many fish of the Caspian exhibit a high degree of euryhalinity. The distribution of ICS and of the fauna as a whole displays a pronounced vertical zonality (i.e. from the sea surface down to the deep sea layers). Those depths are inhabited by purely sea species (herrings, hardyheads, gobies), river species (pickerels, many species of carps, loaches, and others), anadromous (sturgeons, salmons), and semi-anadromous (some species of carps, perch, and catfish).

Ignatius Stone – an island in the Baku Archipelago, located 15 km from Svinoi Island, Azerbaijan. Until 1914, the island used to be a shoalbank, and in 1922, it became a stony island of 20 m in length, rising slightly above the sea level. As the

Caspian Sea lowered, its area reached 0.5 km². The island is of an ellipsoidal shape, strung in a northeasterly – southwesterly direction.

Ikryanoe – village in Astrakhan Region and the center of the Ikryaninsk District, 44 km southwest of Astrakhan (nearest railway station). Situated on the Bakhtemir Arm (Volga tributary). Population is 10.4 thou people. It was established in 1791 by serf peasants of the count D. Zubov. Its original name was Ikryanskoe, but was later changed to I. There is a dairy factory in the village. The district also has: fisheries and fish-processing factories, 2 shipyards, a forestry service, and other enterprises. Local population is engaged in melon and fodder-crop growing and vegetable growing as well as horticulture. Animal husbandry (cattle, sheep, chickens, etc.) is developed. There is a field of brick earth in the district. Also, an archeological monument, Chertovo (Devil's) Hillfort, where an ancient settlement (thirteenth to fourteenth century) was is here.

Ilmen – a shallow lake in the Volga delta, its shores overgrown with cane and reed; an oxbow channel filled with water; depressions between mounds and ridges that are flooded with water; a freshwater eutrophied lake, formed by a spring flood of the Volga R. In Astrakhan Region, also a long arm. In the Volga delta, the Big Ilmen channel; Tatarskaya Borozdina (“great furrow”) Ilmen; the ilmens: turgauishi, Dragun, Korablev, Baklanii, Big Chada, Sukhota, Zaburunnyi, Berlon-Tsag, Big Karabulak, Big Chapchalgan, Kashata and others.

Ilyich Bay (formerly Bibi-Heybat Bay) – located south of Baku. In 1819, oil extraction commenced here. In the nineteenth century, the first attempts were made to recover oil from offshore pits. The viceroy in the Caucasus in 1874, M. Vorontsov organized oil exploration works. In 1903 the first offshore oil wells were drilled here. I.B. earlier cut into the western shore of Baku Bay. From 1909 to 1919, work was conducted on its backfilling and 350 ha were filled with sediment. Only two small “buckets” – Southern and Northern – were left of the former bay. In 1909, 2.9 million tons of oil were extracted here. By 1925, 10% of all Azerbaijan oil was produced in the Bibi-Heybat field.

Ilyinsky Island – one of the four islands on the Volga River, in the Astrakhan Port Water Area. Located mid-river, 5 km upstream of the beginning of Bakhtemir Arm.

Infused Fish – fish placed (in a pit) in a deep-water pool of a river.

INOGATE – Interstate Oil and Gas Transportation to Europe, a program under the TACIS Project aimed at developing the network of oil and gas pipelines to facilitate the transportation of energy carriers in the European Union. The program is intended to resolve the problems of hydrocarbons recovery, transportation, and sale in the Black Sea-Caspian Region. Financial backing is provided by international economic institutions.

Integrated Program on Hydrometeorology and Environmental Monitoring in the Caspian Sea Region (KASPAS) – adopted at the 2nd session of the Coordinating Board on Hydrometeorology and Monitoring of Caspian Sea Pollution

(Baku, February 10–15, 1997). The program is drafted by the experts of the Caspian states guided by the Coordinating Board and under the auspices of the WMO, UNEP, and UNESCO. The Program's main goals: setting up a regional system of obtaining and exchanging information on the state of the air and aquatic environments and on pollution and other characteristics of the natural environment in the Caspian Sea region; carrying out comprehensive research into the problem of Caspian Sea level fluctuation as well as of pollution of natural environments of the region; and evaluating and forecasting impact of pollution on the regional environment.

Program outcomes include implementing permanent operations along with the subsequent development of a system for obtaining and exchanging data on hydrometeorology and environmental monitoring in the Caspian Sea region.

International Association of the Caviar Importers – established in 1998, it is made up of 11 European caviar importers from France, Britain, Germany, Switzerland, and Spain.

Interregional Environmental Association of the Volga Basin – established in January of 1994 as a result of the transformation of the Ecological Parliament of the Volga Basin and the North Caspian. The association comprised territorial divisions in Tver, Samara, Vyatka, Ulyanovsk, Volgograd, Saratov, Astrakhan, etc. The purpose of the Association is to organize public and scientific support at the grass-roots level and to monitor and provide for implementation the program “Revival of the Volga”.

International Institute for Caspian Studies – established in 1998 in Tehran, Iran. Non-government research and consultancy institute aimed at promoting research and seeking grants for dealing with political, economic, ecological, and legal problems of the Caspian Region. The Institute intends to set up an integrated research center whose object will be to encourage researchers and other parties concerned, to participate in solving multi-faceted issues of the region's countries, and to adding fresh initiatives. The Institute focuses its activity on Circum-Caspian countries, with a special emphasis on attending to the interests of the countries of the region. It publishes the “Eurasia” monthly newsletter in Farsi and English.

International Legal Status of the Caspian Sea – see *Legal, International Legal Status of the Caspian Sea*

International Ocean Institute, Caspian Sea Operational Centre – Memorandum on the establishment of the IOI Caspian Branch on the basis of Astrakhan State Technical University (ASTU) was signed in November of 2000. It was inaugurated on May 10, 2001 in Astrakhan. IOI motivated the establishment of the center by the need to cooperate with the Caspian states, namely with Russia (Astrakhan Region, Kalmykia and Daghestan Republics), Azerbaijan, Kazakhstan, Turkmenistan, and Iran in connection with investigations into the problems of the Caspian as well as in coordination and elaboration of common methods of dissemination of knowledge on these problems. The actions of IOI for the Caspian Sea are focused on such

spheres as sustainable development of the sea coastal zone, education and training aimed at the management of the marine and oceanic environments (subject to the observance of ecological requirements), on the deeper understanding by the public of the significance of the Caspian Sea, and on concerns about its condition.

At present, IOI for the Caspian Sea has two agencies in the Caspian region: at the Institute of Applied Ecology at Daghestan State University in Makhachkala and at the Scientific-Research Center “Caspian” at Baku State University. IOI for the Caspian Sea participates actively in many activities arranged by other organizations (Scientific-and Production Association of the Caspian Region) associated with environmental protection, such as the Initiative for Social Activity and Renewal in Eurasia’s (ISAR) Caspian Program. IOI for the Caspian Sea contributes to international programs that are implemented in the Volga-Caspian Basin, including the UNDP-GEF program for the conservation of biodiversity of the Lower Volga wetlands and the Caspian Ecological Program of IOC UNESCO within the framework of the Volga-Caspian Multidisciplinary demonstration UNESCO project. In association with the Caspian Branch of IAELPS and the Astrakhan State Biosphere Reserve, the Center participates in establishing a network of ecological monitoring of the Caspian Sea.

An agreement about cooperation with “Caspiy XXI,” Atyrau City, Kazakhstan, has been signed. Preparations are under way to sign a Memorandum about cooperation with the project IOC UNESCO “Caspian Floating University” with the research center “IFREMER”, France.

International Transport Corridor “North-South” – see “*North-South*” *International Transport Corridor*

Iran – see *Islamic Republic of Iran*

Iranian National Center for Oceanography – conducts oceanographic research in the Persian Gulf and the Caspian Sea. Headquartered in Tehran.

“IRANRYBA” (“Iranfish”) – Soviet-Iranian joint-stock company for bioresources development of the Iranian part of the Caspian (beyond the arbitrary boundary Astará – Gasan Kuli) that operated for 25 years. It was established pursuant to the Agreement on the Use of Fish Resources of the Southern Coast of the Caspian Sea dated 01.10.1927 for fishing and fish processing on the Caspian Shore. Both the parties held 50% of company shares each. The fishing of sturgeons and making smoked products from the catch as well as of Russian caviar, which was almost entirely exported, figured prominently in the activity of “IRANRYBA.” Soviet specialists, who are the world’s best experts at making Russian caviar and balyks (smoked fish), turned out top-quality products that were in great demand on foreign markets. The government of Iran received 64% of all Company earnings in the form of profit, rent expenditure, and taxes paid by the Company. Export operations of “Iranryba” considerably increased the foreign-exchange capability of the government of Iran. Early in 1953, because the 25-year term of the Soviet-Iranian Agreement expired, the Iranian government said it refused to extend the activity of the cooperative

joint-stock company “IRANRYBA.” The Soviet government agreed to dissolve the company, whereby the agreement became legally invalid.

Islam (Arab. literally “submission, obedience, surrendering oneself (to God)) – one of the world’s major religions, along with Buddhism and Christianity. Its followers are Muslims. It emerged in the seventh century in Hijaz, West Arabia, where Islam’s sacred cities of Mecca and Medina are. Inception of I. was a peculiar response to the political challenge that faced the Middle East at the time of transition from Antiquity to the Middle Ages. In fact, during that period, a new world was emerging in Arabia, an active process of ethnic and cultural consolidation of Arab tribes was under way, and a common Arabic Language was spreading everywhere. The founding father of I. was the inhabitant of Mecca, Muhammad (circa 570–632). The basic source of the Muslim dogma are the Qur’an, understood as the eternal, never realized word of Allah, and the Sunnah, the legend of the life, deeds, and pronouncements of Muhammad himself. The religious duties of Muslims are determined by “the five pillars of I.”: (1) worshipping of the one almighty God – Allah (Shahadah) and regarding Muhammad as Allah’s prophet-messenger (Nubuwwa), which is expressed by the formula: “there’s no other god but Allah and Muhammad is his prophet”; (2) daily ritual prayer (5 times a day) (Salah); (3) fasting during the month of Ramadan (Sawm); (4) giving alms (Zakah); (5) a duty to make pilgrimage to Mecca (the Hajj – at least once during one’s lifetime if economically feasible).

Faith incorporates 5 basic provisions: belief in common God; in his messengers and prophets from Adam to Muhammad; in Holy Writs heaven-sent to the messengers; in angels; in doomsday, paradise, hell, and requital for good and evil. Muslims’ holy legend is the Sunnah. All facets of the life of Muslim communities are regulated by shariah, the system that determines cult rules and religious duties, ethics, rules of conduct, and social relations (i.e. a legal system).

The basic lines of I.–Sunniism and Shiism – are extremely hard to define unambiguously. Shiites is the name given to various Muslim groupings and communities that regard Ali and his descendants as the only legitimate heirs-at-law and spiritual successors of the prophet Muhammad. Sunniism as a current took shape during the tenth to eleventh centuries specifically in the struggle against shiism and for this reason its subject-matter is not defined as distinctly as the term “Shiism.” At present, the overwhelming majority of faithful Muslims are Sunnis, and only 10% are Shiites in such countries as Iran, Azerbaijan, Iraq, Lebanon, Yemen, Bahrain, as well as Tajikistan.

Towards the thirteenth century, I. struck a deep root in Central Asia and later in the Golden Horde. I.’s penetration to the North Caucasus was facilitated by Muslim missionaries from Daghestan in the sixteenth century to Chechnya and then to Ingushetia as well as during the military-and-political expansion of the Ottoman Empire and Crimean Khanate (from the fourteenth to nineteenth century) to the Black Sea coast.

In 1774, the Muslims of Russia were granted freedom of conscience. In 1778, the Spiritual Assembly was instituted in Orenburgh headed by the mufti (spiritual leader of all Muslims). There were Muslim factions in 1–4 Russian State Dumas; in

1905, the 1st All-Russia Muslim Congress was held; Muslim political parties were set up. After the 1917 Revolution, the Decree on the separation of church from the state and of school from church was applied to the Muslim clergy.

In the USSR, the activity of Muslim clergy was managed by 4 departments for spiritual activity (in Baku, Tashkent, Makhachkala, and Ufa). When the USSR collapsed, the number of such departments sky-rocketed, and in the Russian Federation there are more than 10 departments (1994).

Islamic Republic of Iran – a state in Western Asia with a territory of 1,648 thousand km². In the north, it borders on Armenia, Azerbaijan, and Turkmenistan; in the west by on Iraq and Turkey; and in the east by Afghanistan and Pakistan. In the north, the IRI is washed by the Caspian Sea, while in the south it meets the Persian Gulf and Gulf of Oman and the Strait of Hormuz. The length of its shoreline on the Caspian Sea is 720 km. Its capital city is Tehran, a city of 8.4 million people (over 13.4 million, with suburbs, 2006). Major cities are Mashhad (2.4 mln people in 2006), Isfahan (1.6 mln people), Tabriz (1.4 mln people), Karaj (1.4 mln people) and Shiraz (1.2 mln people). Administratively, IRI is divided into 30 provinces-ostans. IRI is one of the most multinational states of southwest Asia. Around 40 native majorities and minorities live in Iran. IRI's Population is around 71.8 million people (2006). Ethnic composition of the population is Persians (51%), Azeris (24%), Gilakis and Mazandarani (8%), Kurds (7%), Arabs (3%), Lurs (2%), Baloch (2%), Turkmen (2%), Armenians, Kajars, Afshars, Shahsevens, Qashkai people, Jews, and other nationalities. The average population density is 45 people/km² and the urban population of Iran is 60% of the total. The official language is Persian (Farsi). Farsi writing is based on Arabic graphics, although not without some peculiar differences. The state religion is Shiite Islam (practiced by over 90% of the population). Sunnites account for less than 4% and Christians and Jews for less than 2% (Armenians, Assyrians). Monetary unit is the Rial (1 Rial = 100 Dinars). It has diplomatic relations with the Russian Federation. (Established with the RSFSR on 20.05.1920). National holiday are February 11 (Revolution Day). IRI is an Islamic Republic. In it function a combination of religious and republican authorities. The country lives under the Constitution approved at a referendum (23.12.1979) with subsequent (dated 28.07.1989) amendments. Powers of the state are exercised by the legislative, executive, and judiciary authorities under control of the country's political and Supreme Leader of Iran, Ayatollah Ali Khamenei (elected by the Council of Elders on 04.06.1989 after the death of Ayatollah R.M. Khomeini), who personified religious and temporal power. The highest office bearer after the IRI Leader is President who forms the government and is liable for its activity to the IRI Leader and Parliament. The President is elected by direct vote for a 4-year period. The supreme legislative body is a single-chamber parliament, the Islamic Council Assembly (majlis), made up of 270 members elected by direct and secret ballot for a 4-year period.

The Board of Islamic Revolutionary Guards, made up of 12 theologians, sees to it that the laws are ideologically consistent and comply with the standards of shariah. In fact, Iran is a theocratic state with elements of authoritarianism and a huge bureaucratic machinery. The power of clergy is maintained by the Guards of

the Islamic Revolution, a special Corps within the framework of the Armed Forces of Iran.

Under the IRI Constitution and pursuant to the law passed in 1981, any activity of political parties and other than Islamic organizations is prohibited in Iran.

Iran is situated in the western and central part of the Iranian Upland and in the southeastern part of Armenian Upland. From this location, northern and southern border mountains of IRI fan out in two branches, with peaks at over 3,000–4,000 m. Enclosed between the border mountains is a 1,000–2,000 m high inland plateau, on which tower isolated chains of the East Iranian and Middle Iranian Mountains, with heights up to 3,200–4,400 m. In the west of the northern border mountains stands out Elburz Mt. (extinct volcano Damavand, 5,604 m – Iran's highest point), and in the east are the Turkmen-Khorasan Mountains; the northern strip of the latter – Kopet-Dagh (Hezar- Masjed Mt., 3,040 m) is partly within the territory of Turkmenistan. In the north the foot of Elburz adjoins Coastal South-Caspian Lowland (Iranian Mugan), in the northeast – Gorgan Plain and small areas of the southern outskirts of Karakums. The Kurdistan Range is strung along the northwestern border of Iran with Turkey. The southern outlying arches of IRI include Zagros (Zard Kuh Mt. – up to 4,547 m) and Makran Mountains (up to 2,163 m high). Along the shores of the Persian Gulf and Gulf of Oman, the narrow Germseer Deserts stretches. In the southwest, part of the Mesopotamian Lowland (Huzistan Plain) is within Iran. On the internal plateau, there are distinguished extensive elevated plains, solonchaks, and sand deserts Dasht-e-Kavir, Dasht-e Lut, Jazmurian, and along the border with Afghanistan are the Sistan and Namaskar Deserts, among others.

The climate is subtropical and continental, while in the extreme south it is tropical. Dry, sultry summers, and cool winters dominate. The mean temperature in January is -2°C in the north and $+15^{\circ}\text{C}$ in the south, while July is $+25$ and $+31^{\circ}\text{C}$, respectively. Precipitation within most of the inland areas is from 50 mm to 500 mm/annum (precipitation falls mainly in winter and spring on the seaside slopes of Elburz 1,000–2,000 mm.).

Of the total annual runoff of Iranian rivers (78.5 bn m^3), 16 bn m^3 falls on the rivers of the Caspian Sea basin. The major rivers Araks and Sefid Rud flow into the Caspian Sea, and the Shatt al-Arab R. and its tributary Karun flow into the Persian Gulf. Most rivers, even those that exhibit permanent flow in the upper reaches, are intermittent. The lakes are freshwater, shallow, and brackish, and many dry up or turn to solonchak quaking bogs. The largest salt lake is Rezaye, the only navigable one in the country; the largest freshwater lake is Hamun.

The soils of Iran are mostly of a desert-steppe type. The plateaus are dominated by deserts: serozems and solonchaks; the Circum-Caspian area is dominated by brown forest soils; the mountains are dominated by brown and chestnut steppe soils; the oases feature mainly reclaimed soils. Considerable areas of the county are shifting and stabilized sands.

Vegetation is, for the most part, desert and dry-steppe of phrygana type as well as upland-xerophytic vegetation, typical of which is drought-resistant, pillow-like thorn bushes. Oases of the south exhibit date-palm, and the Circum-Caspian area and northern slopes of Elburz display prevalence of moist subtropical forests, abounding in valuable tree species. Oak, beech, hornbeam, maple grow here. In

Zagros are sparse growths of oak-trees, while the mountains of the northeast occasionally have sparse growths of savin and pistachio trees. The land area under forests is 1.8 million hectare. The northern forests typically abound in ancient rare species, in particular, ironwood (*Parrotia*). The upper tier is dominated by mountain steppes, and in places mountain meadows are widely occurring.

There are up to 700 vertebrates in Iran. Besides European forest forms, there are also Turanian forms, too, including tiger, leopard, hyena, jungle cat, and wolves. Forest-free mountains and deserts exhibit fauna of Central Asian type: Persian gazelle and wild ass. There are rodents and crawlers galore. In the south, the percentage of south Asian tropical forms increases, including kalong, mongoose, and others. The Persian lion is extinct. The Caspian waters are inhabited by valuable fish species: beluga, sturgeon, salmon, stellate sturgeon, as well as herring, kutum, trout and others. There is a well-developed system of protected zones in Iran: 67 refuges and national parks (out of this, 9 biosphere reserves) occupy 5% of the country's land area. Major national parks are: Kavir, Golestan, Lake Urmia, and Central Elburz.

Major oil fields are confined to foredeeps (submontane troughs) that are filled with friable sedimentary rock masses. In terms of known oil reserves, Iran ranks 4th in the world. Total oil reserves are put at 50 bn t. Khuzestan Province and the Persian Gulf shelf are the main fields of hydrocarbons. Iran also has deposits of coal, iron ore, copper, base metals, uranium, molybdenum, chromites, stibium, arsenic, nickel, and cobalt. The reserves of rock salt and building materials are enormous. There are also deposits of gem stones.

Iran (prior to 1935 – Persia), one of the most ancient states in Asia, is one of the centers of early cultivation. As early as in the 3rd millennium B.C.E. there emerged a state by the name of Elam in Khuzestan whose economy was based on land irrigation in the valleys of the Kerhe and Shaura Rivers. In the 2nd millennium B.C.E., Iran-language tribes from Central Asia and Northern Circum-Black Sea area penetrated into Iran. They named their country “Iran” (i.e. “land of Aryans”). It was then that the ancient Iranian religion of Zoroastrianism originated. From the early 1st millennium B.C.E., tribal unions of Midians and Persians came into being. Persians founded the largest empire of all ancient times, the state of Achaemenids (558–330 B.C.E.). The best known rulers of the Achaemenid Kingdom, Kir and Darius I, spread their kingdom from Armenia to the first Nile rapid in Egypt and from Macaedonia to India. Darius I made the Aramaic Language common throughout the state. The capital city of the Achaemenids was the world's most beautiful city, Persepolis (near Shiraz), which, like the empire itself, was conquered by Alexander the Great and later burned. After Alexander died, his military commander Seleucus I Nicator created the Seleucid Empire that enriched the culture of local peoples with Hellenism influence. In the second half of the third century B.C.E., Persia fell under the power of Parthians-Arshakids, a dynasty of East-Persian ancestry. The next rise of the Persian state is associated with the Sassanid Empire (226–651) that was fighting with Rome, then with Byzantine. In 636, under Kadicii, the Arabs destroyed the Sassanid Kingdom. They brought Islam to Iran, replacing Zoroastrianism. For nearly nine centuries, Iran saw great development, being part of the Arab Caliphate, the Seljuq Empire (eleventh to twelfth centuries), then Persia

was conquered by Mongols from the dynasty of Hulaguides (twelfth to fourteenth centuries) who were superseded by the hordes of Timur. In the sixteenth century the Persian state of Sefevids, which comprised Azerbaijan and part of Afghanistan, was formed on the Territory of Persia (1502–1736). From the end of the eighteenth century to 1925, Persia was ruled by the Qajar Dynasty. The dynasty founder, Mohammad Khan Qajar, proclaimed himself the Shahinshah of Iran and moved the capital from Shiraz to Tehran. As a result of colonial expansion of Britain and Russia, by the late nineteenth century Iran had become a semi-colony. Tzarist Russia owned motor and railroads, banks, and many industrial enterprises in Iran. During the 1905–1911 revolution, a Constitution was proclaimed in the country and parliament (Majlis) was convened. In 1921, the British government provoked a coup d'état resulting in the beginning of the dictatorship of Reza Pahlavi, former commander of Russian Cossack Brigade and later a war minister. In 1925, Reza Pahlavi was proclaimed Shah of Iran. During WWII, Soviet and British troops were deployed in Iran. The countries of the Allied Powers imported their goods to the USSR via Iran. In 1943, a historic conference of the leaders of the USSR (I.V. Stalin), USA (F.D. Roosevelt), and Great Britain (W. Churchill) was held in Tehran. At the end of the war, the allied troops were removed from the country. In 1953, as a result of a CIA-inspired conspiracy, the legitimate Government of M. Mosaddegh was overthrown. That government had pursued a policy of strengthening the country's independence (in 1951, the Premier had passed a law on Oil Nationalization). Having moved aside their partners as a result of the coup, the USA, backed by the Shah Mohammad Reza Pahlavi, occupied leading positions in Iran. After WWII, Iran joined CENTO (1955–1979). In 1959, the Shah concluded a military agreement with the USA that reinforced the American presence in the region. In the 1960s, the ruling circles undertook certain socioeconomic reforms, the so-called "white revolution" intended to expedite the development of the country in a western model. This caused discontent in religious circles. On 11.02.1979, an antimonarchic revolution took place, which deposed the Shah regime. On 01.04.1979, Iran was proclaimed the Islamic Republic. Immediately following the revolution, certain circles of the clergy, headed by the religious leader of Shiites Ayatolla R. Khomeini closely connected with petty bourgeoisie and large landlords, having brushed aside all other political forces, set a course for power monopolization in the country. At the same time, under the pressure of people's masses, the religious clergy took some action toward doing away with the Shah's regime legacy. Iran proclaimed as its goal liberation of the country of all forms of dependence on imperialism to protect its national interests; it withdrew from CENTO and joined the Non-Aligned Movement.

As a result of the 1980 Iran-Iraq war, the country sustained a considerable economic damage (over USD 700 bn), nearly 60% of processing industry enterprises were destroyed, and around 1 million Iranians died. In August of 1988, thanks to UN efforts, a cease-fire agreement was reached and peace talks between Iran and Iraq began. In 1990, Iran and Iraq reestablished diplomatic relations.

At the current stage, the course of Iranian leadership on the international scene, especially of its pragmatically-minded wing headed by the president, is characterized by attempts to end the country's isolation the reasons for which lie in the fact that its foreign policy concepts are heavily loaded with ideology. The

idea of “exporting Iranian revolution” has given way to a concept of “dialog of civilizations.” A certain transformation of IRI’s stand on a whole range of international and religious issues has taken place in recent years. IRI is a UN member (from 1945) as well as a member of the “Non-Aligned Movement,” OPEC, OEC, ESCAP, UNESCO, FAO, IDB, OIC, and other international organizations.

Iran is an agro-industrial country. Contemporary Iran is characterized by mixed economy, mostly oriented at the public sector and with elements of national self-sufficiency. Oil-production and oil-and-gas producing and processing constitute the country’s crucial industry: 9 oil refineries. It ensures up to 14% of GDP, 1/3 of state budget receipts, and 87% of foreign-exchange earnings. Annual volume of oil recovery is around 20 million tons. Yet, Iran is unable to meet its oil product requirements using its domestic facilities only. It imports 7–8 million tons of oil products per annum (25–30% of Iran requirements). The country’s known gas reserves equal 14 trillion cubic meter (annual recovery – 58 bn m³). Oil and gas are transported over several major pipelines to the Persian Gulf ports (Abadan), the central (Isfahan), and the northern regions (Tehran). The oil refineries are at Abadan, Bandar-Khomeini, Teharn, and Shiraz. At an advanced stage of development are such industries as oil engineering, radio engineering, motor industry, machine-building, chemical industry, and rubber industry. There are large ferrous and non-ferrous metallurgy plants in the country, the foundations of metallurgy having been laid down in the 1970s. With the assistance of the USSR, the first iron-and-steel plant was built in Isfahan in 1973 (in all, 116 industrial projects were built in Iran with Soviet technical assistance). Production of copper and aluminum has developed at a fast rate. There are major machine-building plants in Tabriz, Tehran, Isfahan, and Ahvaz. The traditional industries are: food-processing, textiles (carpet-weaving), and cement. Iran has well-developed hydraulic-power engineering, heat-power engineering, and nuclear-power engineering. A nuclear power plant is being built at Bushehr with Russian assistance; however, many of these projects suffer from the disturbed foreign economic relations and lack of foreign exchange resources as 60% of these depend on imported raw materials and 90% on imported equipment. The annual requirements of purchases to be made for foreign-exchange equal USD 10–12 bn (with USD 4–5 bn only allocated from the state budget).

Agriculture is the most backward industry of the economy. For this reason, Iran has to import each year wheat, rice, sugar, and vegetable oil (food import requirements amount to USD 2 bn). The area of arable lands in the country equals around 17 million hectare (10% of the total territory), but of this only 4.2 million hectare is irrigated. Here, they grow wheat, barley, rice, legumes, sugar beets, cotton, tobacco, citrus fruit crops, tea-bush, and oilseeds. Horticulture and vine-growing are practiced, too. Iran is the world leader in pistachio growing, and rank 2nd in apricot harvesting and 3rd in raisin production. All these items are exported on a large scale.

In the mountains of Iranian Azerbaijan transhumant livestock breeding is practiced, while in deserts migratory sheep are raised. The flock of sheep and goats is particularly large: 68 million heads.

Although there are few rivers in Iran, the country has a significant fishing industry. Fabrication of black processed pressed caviar is very well known. Until recently

its production amounted to 300 t, which made Iran the world's leading caviar producer.

The bulk of traffic in the country (82%) is done by trucks. The length of motor roads is over 100 thou km and of railways is over 6 thou km, of which 260 km are electric railroads. From Azerbaijan to Kerman in the south the country is crossed by the Trans-Iranian Railway. River navigation is common on the Shatt-al-Arab River and some other rivers. Sea transport (more than 150 ships) is practiced both on the Caspian Sea and in the Persian Gulf. Iran has air transport, too. Foreign tourism has been revived lately.

Foreign economic relations were given a fresh fillip in 1990, while the introduction of import restrictions in 1993 was conducive to a positive foreign trade balance. Oil is the backbone of Iran's exports (85%). Other traditional export items are carpets, fruit, nuts, Iran exports steel, and chemical products. Iran imports semi-finished goods, foodstuffs, arms. The main trading partners are Japan, Great Britain, Italy, France, Germany, Russia, and UAE.



Islamic Republic of Iran (http://www.lib.utexas.edu/maps/middle_east_and_asia/iran_rel_2001.jpg)

Island Shoal – subsea continuation of an island’s or archipelago’s shore slope.

Itil’, Edil’, Ledil’ – common medieval name for the Volga, derived from its Turk name. Such was the name of the Volga used by the nomadic tribes: Khazars, Qipchaks, Pechenegs, Tatars. West-European and Eastern writers-geographers and travelers made this name common in Europe (see *Volga*).

Itil’ – capital city of the Khazar Kaganate in the eighth to tenth centuries, it was located upstream of contemporary Astrakhan on both banks of the Itil’ (Volga) River. It was destroyed in 965 by the prince, Svyatoslav.

Lengthy debates regarding the location of I., have been going on for a long time. Allegedly, however, the debate has recently been settled after excavation at the Samosdelskoe site of ancient settlement in Kamyziak District of Astrakhan Region. Ruins of the Khazar Kaganate capital city covered the remains of two other cities, including Summerkent of the Golden Horde under which the remains of structures dating to the eleventh to twelfth centuries were discovered, which was identified with the city of Saksin, a regional center that existed early in the 2nd millennium in the Volga delta.

Ivashintsov Nikolay Alekseevich (1819–1871) – Russian hydrographer, Rear Admiral, Corresponding Member of Petersburg Academy of Sciences. In 1854, he made two reconnaissance voyages on the Caspian Sea with a view to drawing up a general plan of hydrographic investigations. From 1856 to 1867, he led a large hydrographic expedition for surveying and measuring the Caspian Sea. During the expedition, a tragic wreck of the Steamship “Cuba” occurred in which 22 people died. Logs of astronomical observations, equipment, and instruments disappeared. As a result of long-term explorations, over 60 astronomical sites were determined and 25 detailed high-accuracy maps of various locations on the Caspian Sea were prepared, along with 24 precise plans and 2 atlases, one of which (1863) deals with the Terek River (10 maps). I. drew a detailed atlas of magnetic variation, and made a first-ever attempt at calculating the Caspian water balance. In 1864, he was awarded the Constantine Medal of the Russian Geographical Society for long-term effort in making a description of the Caspian Sea. Main publications are: “Hydrographic Investigations of the Caspian Sea” (v. 1–2, 1866 and 1870), “Atlas of the Caspian Sea” (1877), and “Pilot’s Sailing Directions of the Caspian Sea.” The following researchers participated in the expeditions side by side with I.: N.L. Pushchin, A.F. Ul’sky, F.N. Kumani and many others.

Izberbash – city (from 1949) of significance in the Daghestan Republic. It is situated 56 km southeast of Makhachkala in Coastal Lowland, stretching along the Caspian Sea. *Izberbash* (Kumyk.) – “footprint on the mountain-top” – natural ridge of the mountain resembling the profile of A.S. Pushkin (Russian poet). Population 51.2 thou people (2009). In the north and west, it is delimited by the Greater Caucasus foothills. The city was established in 1932 as a settlement for oilmen (the oil field is 3 km from the station and the settlement). Since 1948, they’ve been

recovering oil from the seabed. A railway station exists here on the Makhachkala-Baku line as does a highway from Rostov-on-Don to Baku. It has a machinery and repair plant, building materials works, an electroheating equipment plant, and the Dargin Drama theater.

Izberbash Plain – an isolated part of the Coastal Plain in Daghestan located to the south of the Buinak Cape and the Izberg-Tau Mountain and passing into the Terekmeisky Plain. Its length is 10 km and its width is 3–5 km. Its greater part is covered by the Caspian waters. On all sides, the plain is surrounded by ridges of the Late Khvalyn terrace composed of sands, loams, and clays. A rather wide strip of dunes from 20 to 25 m high runs along the Caspian coast.

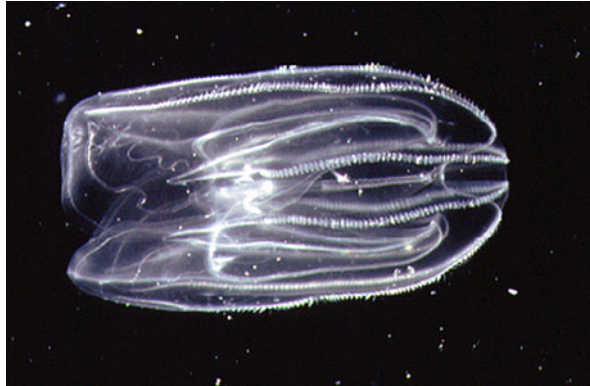
J

Jayranbatan Storage Reservoir – constituent part of the City of Baku water supply system. Located 10 km to the south of Sumgait Town and 15 km north-west of Baku. The source of alimentation is the Samur River, with water taken from a canal some 150 km north of Baku. Built between 1961 and 1978, the reservoir's storage capacity is 86 million cubic meter with seasonal fluctuations. Water in the amount of 7.5 m³/s and for a water treatment plant is withdrawn from the storage reservoir by means of a water pipeline with a diameter of 0.8–1.4 m.

Jellyfish Mnemiopsis (*Mnemiopsis leidyi*) – belongs to lobate jellyfishes *Ctenophore* of *Tentaculata* class, *Lobata* order, *Mnemidae* Esch. family. Small invertebrate, free-going medusa-like organism, max. 3 cm in length of North-American origin. Its body, consisting of 97% water and transparent (only large individuals are likely to have a milky shade), gelatinous, its shape reminiscent of a walnut. For the first time ever was photographed in the waters of the Caspian Sea in 1999. Feeds on plankton and filters virtually all organic substances on the water surface. Eats up daily around 40% of own weight. Has been introduced in the food chain of the Caspian Sea biological community with ballast water from the Azov-Black Sea basin via the Volga-Don Shipping Canal. The explosive character of propagation and a predatory nature of J. are likely to result in the shrinkage of the fodder base and decline of its nutritional value, which may have an adverse impact on kilka, the herrings, young mullet, and silverside. In order to facilitate biological monitoring and combating of jellyfish, it is proposed that another jellyfish be introduced in the Caspian Sea, *beroe ovata*, a predator feeding on nothing but JM. However, the capacity of this species to survive in the conditions of the Caspian Sea must be studied, as well as an impact on other biological organisms.

Jenkinson Anthony (1529–1611) – British merchant and diplomat, envoy of Queen Elizabeth, and an agent of a trading company established in England to promote trade with Moscovia. Traveled in Europe, Asia, and Africa. In 1557–1572, visited the Russian State four times. With permission of the Tzar Ivan IV (the Terrible), traveled to Iran and Central Asia via Russia (Kazan, Astrakhan) in 1558–1559 and 1562–1564 in order to explore once again the trade route to China. J.

Jellyfish *Mnemiopsis leidyi*
(http://www.marine.csiro.au/crimp/images/NIMPIS/Mnemiopsis_leidy.jpg)



succeeded in convincing Ivan IV to grant a trade monopoly to England (1567–1569), subject to concluding a union treaty between England and Russia. When England refused to sign the treaty, Ivan IV repealed the monopoly (1570). J. wrote descriptions of his travels, which are an important source of history of mutual relations between Russia and England, Bukhara, Khiva and Persia.

Jilan Sea – see *Caspian Sea, Names*

Joint Statement of the Russian Federation and the Azerbaijan Republic on the Principles of Cooperation in the Caspian Sea – signed on January 9, 2001 in Baku during the state visit of the RF President V. Putin to the Azerbaijan Republic. The parties confirmed that the elaboration of a new legal status of the Caspian Sea was the business of the Caspian states and that such status could only be elaborated subject to their common agreement. Willingness of the participants was expressed to act in concert so as to establish multilateral negotiations (between 5 nations) regarding the Convention on the legal status of the Caspian Sea. The parties confirmed their desire to see the Special Working Group at the level of the Deputy Foreign Ministers of the Caspian states act on a regular basis. The parties noted that in conditions when there are still substantial differences in the stances of the Caspian states on the matter of a new legal status, it is necessary to move stepwise toward a consensus-based solution of the problem. As a first stage, delineation of the seabed among the contiguous and subtending states into sectors/zones on the basis of the method of median line drawn, considering equidistance of the points and modified by arrangement between the parties as well as with due regard to the generally-recognized principles of international law and the existing practice in the Caspian Sea area was proposed. The parties agreed that each of the coastal states in the sector/zone formed as a result of such delineation would have sole rights in respect of mineral resources and other legally valid economic activity on the seabed. In view of the deteriorating environmental situation on the Caspian, including the critical state of its sturgeon population, the parties agreed to expedite reviewing of

the matters of fishing and of protection of the Caspian Sea natural environment. The parties spoke in favor of setting up of a multilateral Caspian Center that would attend to the monitoring of natural environment of the Caspian Sea.

Joint Statement of the Russian Federation and the Islamic Republic of Iran on the Legal Status of the Caspian Sea – signed on March 12, 2001 on the results of the negotiations in Moscow between the President of the RF V. Putin and IRI President S.M. Khatami. The parties agreed that the Caspian Sea should remain a sea of peace and friendship; the Parties recognize the Agreement between the RSFSR and Persia dated February 26, 1921 and the Treaty on Trade and Navigation between the USSR and Iran dated March 25, 1940 and supplements to it as the legal basis regulating the activity on the Caspian at present. Until the legal status of the Caspian Sea is improved, the Parties shall not recognize officially any boundaries on this sea, and shall, on the basis of the aforesaid foundation, promote cooperation on the Caspian Sea in various areas by developing the required legal procedures. All decisions and arrangements regarding the legal status and regime of Caspian Sea use shall only be valid if adopted subject to the consensus of all five Caspian states. In view of the currently continued growth of Caspian Sea pollution and the increasing hazard of its ecology being destroyed and unique bioresources vanishing, the conservation of the ecosystem of this water body was declared to constitute the collective the responsibility of the coastal states. The parties declared that they refused to accept attempts to lay any trans-Caspian oil or gas pipelines over the seabed that present an environmental hazard to the conditions of extraordinarily active geodynamics. The Caspian Sea and its resources are a joint asset of the five coastal states that enjoy sole rights in respect of this unique water body. Improvement of the legal regime, forms, and methods of the Caspian Sea use is up to the Caspian states themselves. Interference of third parties in this process is inadmissible. The Parties adhere to the principle of responsibility of the Caspian States for damage caused to the natural environment of the Caspian Sea and to one another as a result of activity aid at using the Caspian Sea and development of the marine resources.

“Journey Beyond Three Seas” – a narrative of Afanasiy Nikitin about his traveling in 1466–1472 over Persia and India. This is a literary and geographical monument of the fifteenth century. In the sixteenth century, after the Turks became established in the Mediterranean, they cut all East–West merchant ways. The most convenient way to India went along the Volga and via the Caspian Sea.

In 1466, Ivan III, after receiving envoys from Shemakha, sent back his own envoy, Vasily Panin, who was accompanied by merchants from Moscow and Tver for establishment of trade relations on the eastern coast of the Caspian Sea. One of these merchants was Afanasiy Nikitin (there is information, however, that A. Nikitin started down the Volga no earlier than in April 1468).

After the death of A. Nikitin in Smolensk on his way back home, his narratives were handed over to the Moscow envoy office where they were accepted with great attention. They were included into the chronicles as most important state documents.

Nikitin opened his narrative as follows: “I wrote about my wicked trip beyond three seas: the first sea – Derbenskoye (Caspian Sea), doria Khvalisskaa; the second sea – Indian, doria Hundustanskaa; third sea – Black, doria Stambolsky”.

The narratives are divided into three parts: the first part – traveling from Tver to Shemakha and then via the Persian lands to the coast of the Persian Gulf (from autumn 1466 to spring 1469); the second part – traveling over India (from spring 1469 to early 1472); the third part – traveling back home via Persia and Turkey from the coasts of the Persian Gulf to the Black Sea and Crimean coast (summer-autumn 1472).

The historical significance of the Nikitin’s narratives was stressed by Karamzin who wrote: “So far the geographers did not know that the honor of one of the most ancient journeys to India belongs to Russia of the Ivan times . . . While Vasco de Gama only thought about finding a way from Africa to Hindustan our merchant from Tver traded on the banks of Malabar and spoke with the local people about dogmas of their beliefs” (“History of the Russian State” – vol. VI, 1834, pp. 365–366).

Jurjan Sea – (Arabic form of Girgan, Gurgan) – see *Caspian Sea, Names*. This name was in use throughout the Middle Ages, but was only dominant prior to the tenth century, being popular with the early geographers of the Arab Caliphate, especially with Ibn Khordadbekh.

Jut, Dzut (Turkm., Mong.) – a natural disaster that occurs when livestock is unable to find fodder on rangelands due to drought, deep snow, or glazed frost.

K

Kalmychkov's Shoalbank – located in the southwestern part of the Caspian Sea, east of the Salyan Roads. It was discovered in 1936. That year, it was named after Petr Andreevich Kalmychkov, the manager of hydrographic operations on board the hydrographic ship “Vekha” (“Milestone”) (formerly “Tiflis” or “Tbilisi” and built as a tanker and originally called “Amalia”; in 1932, it was deleted from the fleet register).

Kalmyk Force (Stavropol Kalmyk Force) – irregular cavalry force created in 1739 near Stavropol Fortress (currently Toliatti City) and staffed with Astrakhan, Don, and Orenburg Kalmyks. In 1806, it became part of Kalmyk District of the Don Cossack Force. In 1815, it was disbanded. In 1912, to commemorate the 100th anniversary of the victory in the 1812 Patriotic War, an extensive treatise was published entitled, “Military history of our Kalmyks. Stavropol Kalmyk regiment and Astrakhan Regiments in the 1812 Patriotic War.”

Kalmykia – see *Republic of Kalmykia*

Kalmyks (selfname – *halmg*) – a people in the RF (174 thou people in 2002) and the dominant population of Kalmykia (over 156 thou people). Also inhabit Astrakhan, the Volgograd region, and in Stavropol Territory. Their ancestry is traced back to Oirats of Jungaria (northwestern China), and their main occupation is nomadic stock-raising. Their language is Kalmyk (Oirat), which belongs to the Mongolian group of languages. They are Buddhists, yet there are also Russian Orthodox believers there.

From the end of the fourteenth century, Oirats were consolidated under the name of *derven ord* (“four closely related” tribes: Derbets, Hoshuts, Torgouts, and Choroses). Late in the sixteenth century and during the first half of the seventeenth century, the Oirats moved into the bounds of the Russian state. In 1608–1609, some of the Oirats – Derbets and Torgouts (as the Kalmyks were referred to in the Russian sources from the end of the sixteenth century) – took Russian citizenship, while others advanced into the interfluves of the Yaik (Ural) River, Volga, and Don as well as toward the Circum-Caspian area. In the seventeenth century,

Lamaism (a Tibet-Mongol form of Buddhism) became widespread among K. In 1664–1771, the Kalmyk Khanate existed, and in the second half of the eighteenth century, some of K. were resettled on the Yaik (Ural) River, Terek, and Kuma. In 1771, due to oppression by the Tsarist administration, most K. moved to China. Only around 13 thou families were left behind in Astrakhan Province. Catherine II abolished the Kalmyk Khanate, and K. remained a nomadic people until the end of the nineteenth century. After the revolution in 1920, the Kalmyk Autonomous Region was formed as a part of Russia. In 1935, it obtained the status of Kalmyk ASSR. In 1943, K. were subjected to forced deportation to Siberia and North Kazakhstan, allegedly for “collaboration with the German Army”. The number of K. deported totaled more than 120 thou. The Kalmyk ASSR was abolished. In 1957, the deportation decree was repealed, and the Kalmyk Autonomous Republic was instituted again as part of the RSFSR. Nearly all K. returned to their motherland.



Kalmyks
(<http://visualrian.ru/storage/PreviewWM/1103/35/110335.jpg>)

Kamyzyak – a city in the Astrakhan Region and center of Kamyzyak District, 35 km south of Astrakhan, Russia. It was set up in the seventeenth century as a fishing village in one of the main arms of the Volga delta, Kamyzyak, hence its name. From 1918, it was a village, then in 1966 it became an industrial community, and from 1973 it has been a city. It is located in Circum-Caspian Lowland in the Volga delta. The nearest railway station is Astrakhan-1. There is a motor road to Astrakhan. Population is 16.1 thou people (2009). K. is an agricultural center with food-processing factories: “Kamris” factory (rice processing) and “Kamos” (canning factory). There is caged animal-breeding and an area of advanced fishing. Rice, vegetables and water-melon cultivation and production of pectin from fodder water-melons is also pursued here. A Scientific Research Institute for Irrigated Vegetable and Melon Cultivation is here. Cattle-breeding for milk and meat is also practiced. Archeological monuments include the ancient settlement of “Samosdelki” and a burial ground (“Karakol” and “Bolshoy Haji”).

Kamyzyak, Kamyzyak System – one of the main arms of the Volga delta, it occupies a narrow strip in its western part. The main directions of flow in the system are Kamyzyak–Rytyi (“Dug out”) Shoalbank and Kamyzyak–Nikitin Shoalbank.

Kara-Ada – rocky island situated near the eastern shore of the Caspian Sea 2.5 km west of the Dagjik Cape and sheltering Begdash Bay on the west. It is in the waters of Turkmenistan. The surface is overgrown with shrubs, and a lighthouse is erected in the middle of the island. Near the island’s eastern shore is a jetty for small ships. KA is described as “Black Island” in K.Paustovsky’s narrative “Kara-Bugaz”.

Kara-Bogaz-Gol Bay (Kara-Bugaz, Aji-Darya, Kuli-Darya) (Turk. *kara* – “black,” *bogaz* – “throat, bay,” *gol* – “lake, black jaws”) – bay on the eastern coast of the Caspian Sea, in Turkmenistan, the world’s largest deposit of natural marine salts. The bay has in a way long been a regulator of the level of both the water and salt balance of the Caspian Sea. It was not for nothing that Turkmen nicknamed the sea *Kuli-Darya* – the “sea servant.” At times, the bay is referred to as the “Caspian Sea leech.” According to the ancient legends, there is a trench in the bay that swallows Caspian waters and even ships that risk entering it. In reality, the bay is a shallow depression in relief with a flat bottom and a variable shoreline.

The earliest information on KBG was discovered by Russian Sea-farers dates back to the eighteenth century. In 1705, A. Bekovich-Cherkassky made a route survey of the Caspian eastern shore and mapped a considerable part of the bay. I.M. Zherebtsov’s expedition was the first to map the sea strait, the shore, and the KBG water area; and to measure its depths and current velocities, describing the shore relief. During A.A. Lebedintsev’s expedition (1897), the conditions of mirabilite formation from Kara-Bogaz salts were studied (by that time, it had been established that the bay was a field of Glauber’s salt – mirabilite).

KBG is the world’s largest lagoon, separated from the sea by sand spits. Between these, there is a 7–9 km long strait, with a width of 400–800 m and a depth of 3–4 m. The sea water rushes down the strait at a speed of 50–100 cm/s into the

bay where it evaporates completely. As a result of the Caspian waters evaporation and due the bay's own "century-old" deposits, its basin is filled with brine: sea water concentrated to over 300‰. This salt liquor (salt brine) is a saturated solution of salts: sodium, magnesium, and potassium chlorides; magnesium sulfate; and a few rare earth elements. Physiographic conditions of KBG, its natural regime, which is, determined by the level of the Caspian and runoff into the bay are subject to considerable year-to-year variations.

During the first decades of the twentieth century, the drop of sea and bay level was insignificant (around 0.5 m) and there existed a hydraulic relation between them. The KBG level stayed at an elevation close to -26.5 m relative to the World Ocean level. The bay area was over 18 thou km², with a water volume of 130 km³ and a prevalent water depth of 8–10 m. The water influx into the bay equaled 18–25 km³/year. Each year, there were deposited around 330–380 million tons of salts in the bay, yet its role in Caspian Sea freshening was insignificant: 0.2–0.3‰ over 100 years.

The current water-salt equilibrium between the sea and the bay has been the basis for industrial development of the KBG salt resources. The total salt reserves in the bay are put at billions of tons. These are the largest deposits of sodium sulfate in Eurasia and the only place in the world where mineral salts in natural conditions of crystallization have been recovered on an industrial scale.

During the early decades of the twentieth century, extraction of chemical raw materials was based on natural processes. Crystalline sodium sulfate Na₂SO₄ * 10H₂O (mirabilite, Glauber's salt) that was being deposited on the seabed of the bay would be cast onto the gently sloping shores of the bay during winter storms. In summer, the water that soaked mirabilite was evaporated and the mineral turned to anhydrous sodium sulfate (thenardite) that would be collected at the end of the summer.

Early in the 1930s, the "Karabogazsulfate" Trust was established for industrial recovery of the salts. Production was based on a novel basin method, where the surface brine would be injected into the adjacent dry hollows and, as a result of evaporation, mirabilite would be deposited. The brine devoid of sulfate would be drained into a different basin, whereas mirabilite would be collected by special machines and sent to the user.

From the 1930s, due to protracted lowering of the Caspian Sea water level, there occurred substantial changes in the outward appearance of the KBG. Sea water input into the bay declined to 8–10 km³/annum, and the water balance was upset. As the sea level dropped, the bay area decreased and so did the depths, while the length of the strait increased and its bottom was washed out. By 1948, the basis of erosion fell by 2.5 m; however, in the 1960s, when solid rocks outcropped, erosion on the bottom of the bay was almost nil. The difference between the sea level and bay water level increased and there emerged the world's only marine waterfall of around 3.5 m in height at the end of the strait. Fish and other living organisms passing through the strait would congregate at its mouth. The strait's bluish sea water flowing amid yellow sands, the waterfall with the adjoining part of the bay, and the peculiar fauna

of birds and mammals produced a unique natural complex on the desolate eastern shore of the Caspian Sea.

The decreasing water volume of KBG, coupled with the lengthy lowering of the sea level and the resulting increase of salt concentration in the brine, and change in its chemical composition have had an adverse impact on the conditions of sulfates development. Industrial recovery of salts from the surface brines became unprofitable, giving way to a method of raw materials extraction from buried interstratal brines occurring between the salt layers and the bay seabed and characterized by constant salt composition. Since the early 1950s, “Karabogazsulfate” started operating with buried brines only. Besides sodium sulfate, extraction of sodium chloride (bischofite), magnesium sulfate (Epsom salt), and Glauber’s salt was under way. There were also plans for integrated processing of brines for the production of a broad range of chemical products (including bromine, boron, magnesium oxide, rare metals, and others).

During the period of lengthy lowering of the sea level by the end of the 1970s, the flow of Caspian water into the bay fell to 5–7 km³/annum, the level of the bay dropped to –32 m, its area decreased to 10 thou km², its water volume fell to 20–22 km³, while its brine salinity rose to 270–290‰. In a bid to reduce the discharge of Caspian water and slow down the drop of Caspian Sea level, the strait was bridged by a dam, and the ingress of sea water into the bay stopped.

After the bay was separated, it began drying up quickly. By the end of 1983, the bay area equaled 1,000 km², with a volume of 0.2 km³ and depths of 0.1–0.3 m. Salinity reached the value of 330–380‰. By mid-1984, the bay was virtually dry. The surface layer of salts deposited from the bay brine was a hard crystalline rock made up largely of 5 minerals: halite, astrakhanite, epsomite, glauberite, and gypsum. The separation of the bay from the sea resulted in chemical changes in the composition of the salts of buried brines and deterioration of chemical raw materials, making raw materials processing a more complex process.

When the sea level began to rise rapidly and in a bid to conserve and develop the unique salt deposit it was decided to restore the flow into the bay. In September of 1984, Caspian water began to be supplied into the bay by pipelines in the amount of 2 km³/annum, and the bay gradually assumed its former outline. In the summer of 1992, the dam was demolished and the natural flow of sea water into the bay resumed. With the Caspian level being high, the annual volume of flow reached 42–52 km³/annum in 1994–1995, thus exceeding earlier observed values considerably. Toward the end of 1995, when the bay basin was filled, the water discharge in the strait began to be determined by evaporation from the surface only and declined to 17 km³/annum in 1999. Significant volumes of sea water flow into the bay between 1992 and 1995 assisted deceleration of further Caspian Sea level rise by more than 30 cm. At present, the normal water level in the bay has been restored and so have been its boundaries within the bedrock coasts; the water area equaling out at around 18 thou km². This makes it possible to actually revive the unique natural landscape and ecology of KBG and use the terrific natural wealth of the bay.

Kara-Bogaz-Gol Bay
(http://upload.wikimedia.org/wikipedia/commons/d/d4/Kara_bogaz_gol.jpg)



Kara-Bogaz-Gol Strait – passes between the Southern and Northern Kara-Bogaz-Gol spits and links the extensive bay of the same name with the Caspian Sea. The spits are structured by tertiary rocks covered with sands. The 1–2 km wide spits rise 3 m above the Caspian Sea level. The strait in its western part reaches the width of 160 m, narrowing to the south. The depths in the strait range from 1 to 4 m. In the past, there was a ferry across the strait. In 1980, the strait was dammed to separate Kara-Bogaz-Gol from the Caspian Sea to prevent a further decrease of the sea level. In 1992, the dams were demolished and the strait restored.

Karabotan – lake situated 46 km to the northeast of Atyrau, Kazakhstan. A mud bath health resort location. The main curative muds are sulfide silty mud from the lake, with mud reserves over 60 thou t. Mud cure is combined with hydrotherapeutics for the treatment of the nervous system, locomotive system, and gynecopathy.

“**Kara-Bugaz**” – a narrative by the Soviet writer K. Paustovsky, first published in 1932 in Moscow by “Molodaya Gvardia” Publishers. The background of writing the book is detailed in another book by the same author, “Golden Rose” (see Chapter “History of One Narrative”). While working at his book, Paustovsky traveled throughout the Caspian shore, except the Iranian segments. The narrative deals with the background of Kara-Bogaz-Gol Bay’s discovery and development and is based on the true facts. Its main characters are real persons.

Karagel (Garagol) – Cheleken urban-type community and oil port, Turkmenistan. Situated on the northwestern shore of South-Cheleken Bay.

Karagie Batyr – one of the largest depressions on Mangyshlak Peninsula, south-east of Aktau City, near the eastern shore of the Caspian Sea; it is the deepest one in the Kazakhstan Republic. A dry depression of karst origin, 132 m below the ocean level, some 65 km long and up to 20 km wide. The seabed is covered with solonchaks.

Karagie Batyr
(www.7keremet.kz/images/w/norm/700/56b899674f4...)



Karakums, Sands – stand-alone tract of hillocky-barchan sandy eolian relief with deflation depressions (sors) situated within the coastal strip from the Emba Valley to Komsomolets Bay (to be more exact, to the northern border of the Dead Kultuk Sor) on the Kazakhstan coast of the Caspian Sea.

Karazhanbas – largest oil field. Situate on the Caspian Sea coast 220 km to the northeast of Aktau City, Mangistau Region, Kazakhstan. Ever since the field was commissioned in 1981, the oil has been recovered by thermal methods: hot-steam impact and in-situ combustion. Maximum capacity of the field is 4 million tons of oil per annum. Heavy oils (940 kg/m^3) contain up to 300 g/t of vanadium pentoxide and up to 1.8% sulfur. The unique properties of oil make it possible to fabricate high-quality mastics and bitumens that can be used at temperatures from +110 to -30°C . The field is provided with infrastructure for power, water, gas supply, and oil transportation. An airport and an asphalt road as far as Aktau are here.

Karelin Grigory Silych (1801–1872) – Russian traveler and natural scientist. Was brought up and educated at a military school, which he left in 1817 with the rank of an artillery warrant officer. In 1824, having committed a minor fault, he was exiled by Arakcheev's order to Orenburg, where, before long, he attracted the attention of the Military Governor Essen. Commissioned by Essen, K. made several travels in Orenburg Territory and the Kyrghyz Steppe between 1824 and 1831. In 1832, K. was commissioned to explore the northeastern shore of the Caspian Sea to find a suitable location for the building of a fortress. He made a map of the Caspian Sea – one of the most trustworthy at the time. In 1834, he made a second voyage to Dead Kultuk Bay, having a special mission of setting up a fortification at Kyzyl-Tash Stow, later named Novo-Aleksandrovskoe. In 1836, K. headed a large “commercial-scientific” sea expedition of the Marine Ministry on board the ship “Svyatoy Gavriil” to explore

the eastern shore of the Caspian Sea and small bays on the Kazakh and Turkmenian shores, pursuing the military and political goals of the tsarist government to oppose the aggressive policy of the British. Pursuant to the secret instruction issued to the expedition participant, I.F. Blaramberg, Captain of the Joint Staff, he was ordered not only to explore the eastern shore, but to “make surveys and plans of locations important in military and commercial respects”. K. discovered and described Kara-Bogaz-Gol Bay. The expedition collected diverse information on the natural wealth of the Circum-Caspian areas of the existing Turkmenistan and the shore of Astrabad Bay; made collections of minerals, plants, and birds; drew 10 geographic maps indicating features important in military-strategic respect on the eastern shore of the Caspian Sea. The expedition also collected valuable ethnographic materials and data on the economic pattern and way of life of the Circum-Caspian Turkmen.

After 1852, K. lived at Guriev, preoccupied with ichthyological research. Not long before his death, a fire at his residence that destroyed major works on botany and zoology. A total stranger to those around him, an unrecognized, somber, and lonely person, K. died at Guriev in 1872. The diaries of his 1832 and 1836 voyages titled “An Overview of the Eastern Caspian Shores” were published by Professor M.N. Bogdanov in 1883 in the 10th volume of the Proceedings of the Imperial Russian Geographical Society.

Karganrud – river on the Iranian coast of the Caspian Sea. It flows in the western part of Gilan Province. The City of Hashtpar is also on the bank of the river, 5 km from the Caspian shore. K. source is on the northern slope of Bogrovdag Ridge at a height of 2,220–2,700 m. The catchment area is 710 km², and the river is 41 km long. While the river is short, its slope is significant, and its flow is characterized by high velocities. The average discharge equals 7.7 m³/s.

Karynzharyk, Kenderli-Sor Solonchak – depression in the south of Mangyshlak Peninsula, 55 km east of Zhazgurly-Basgurly depression, Kazakhstan, and oriented from the southwest to the northeast, acquiring a sub-latitudinal direction in its northern part. The depression is about 70 km long, its width averaging 6–8 km. The lowest elevations are –67 m. The eastern side of the depression is steep, up to 350–380 m in height, while the western side is gently-sloping (Karynzharyk Sands). The depression occupies part of Ustyurt Reserve. 2 gas-bearing structures (Kansu and Yuzhnyi Kansu) have been discovered in the center of the depression.

Kashagan, Eastern and Western – oilfield on the Caspian shelf, Kazakhstan. Named in 1992 in honor of the great improvisational poet, Kashagan. The first exploration well on the Eastern Kashagan Field-1, 75 km southeast of Atyrau in the northeastern part of the Caspian at a water depth of 3 m and an overall depth of 5,172 m was sunk in June of 2000. On the strength of the first test, oil with a yield of 600 m³/day and gas with a yield of 200 thou m³/day were obtained. Oil density measured in situ equaled 42–44° API. An oil-bearing interval was discovered in the well in Paleozoic carbonates at depths below 4,000 m. The second well, Eastern K.-2, situated 8 km to the north of the Eastern K.-1 well, was drilled in 2001 to a depth of 4,142 m. The yield equaled 7.4 thou barrel/day. Simultaneously, the first well on the Western Kashagan was drilled 75 km southeast of Atyrau. The Western

K.-1 well was drilled to a depth of 4,982 m (sea depth at the point of drilling was 7 m). The oil-bearing horizon was discovered in paleozoic carbonates below 4,250 m. During well testing, the inflow of oil amounted to 540 m³/day and gas amounted to 215 thou m³/day. At the same time, the measured oil density equaled 42 and its temperature was 45° in compliance with the API standard. K. reserves are estimated at 7 bn t of hydrocarbons.

Kashkarata – depression to the north of Melovoi Cape on the Mangyshlak Peninsula, Kazakhstan. K. seabed is 10 m below the Caspian Sea level. Its most depressed part is occupied by a saline dry lake with an area of around 30 km². There is a halite bed on the lake. Its thickness, measured only in the northern part, is 0.5 m.

Kaundy – depression situated 22 km to the northeast of Kazakh Bay in the Caspian Sea, Kazakhstan. Its area is 0.7 km² with a depth of 55 m. Seabed elevation – 55 m. Distance from the seashore is 16 km.

“Kavkaz and Merkurii”, Shipping Company – one of Russia’s largest river and maritime joint-stock shipping companies. Established in 1859 as a result of a merger between the Volga Shipping Company, “Merkurii,” and the newly established Caspian Sea Shipping Company, “Kavkaz”. The “K and M.” Company was established with the assistance of the Ministry of Finance and the Caucasian Lieutenant General Duke A.I. Baryatinsky. The Board of “K. and M.” was headquartered in Petersburg.

The “K. and M.” Company enjoyed some privileges granted to it by the government: the sole right of carrying mail, troops, and military cargoes, and an annual subsidy of Rbls. 350,000 for the maintenance of regular ship trips to meet the needs of the state participation in direct transit for Black-Sea–Caucasus–Volga–Transcaspian communications as well as by making use of the Astrakhan Military District’s hardware made available to the Company in 1878, including the shipyard. The “K. and M.” Company was the first to launch iron barges on the Volga River and to build and equip wharfs, storage facilities, repair shops at all ports on the Volga and Caspian Sea. In 1870 in Baku, the Morton system slipway to repair large-capacity vessels was placed and in 1884 a kerosene power station was set up there, too. In 1905, the Company purchased an oil field in Bibi-Eybat Bay.

Gradually, the “K. and M.” Company enlarged and improved its fleet. In 1869–1870, the first-ever on the Volga American-type motor vessel, “The Emperor Alexander II,” was purchased in Belgium and delivered in installments. In 1870, oil fuel for motorship boilers (Lenz’s nozzle) was used on the motorship “Derzhavin” for the first time in Russia. When the new mail-and-passenger motorship “Crown Prince Alexander” and the passenger river motorship “Konstantin Kaufman” began to be operated on the Volga in 1876, the Company introduced and strictly adhered to the passenger traffic schedule from Nizhny Novgorod to Baku – 8 days and 1.45 h. From 1880, the Company began building steamships with luxurious furniture and finish and electrical lighting (“Ivan Grozny,” “Fieldmarshal Suvorov,” “Svyatoslav,” “Vladimir Monomach,” and “Grand Duchess Olga Nikolaevna”). The quality of Company’s steamships was so high that in 1896 it was granted the

privilege of painting the National Emblem on the ships. In 1887, the cargo carrier “Tehran” with a reduced draught able to enter the shallow Persian port of Anzali was built. The Company’s new motor vessels “Grand Duke Aleksei” and “Admiral Kornilov” made voyages on the Caspian Sea from 1890, and from 1896 the motorships “Emperor Nikolay II” of 40 thou puds tonnage and “Empress Alexandra” of 30 thou puds tonnage were built. From 1902, the speed maritime motorships “Skobelev” and “General Kuropatkin,” built in Belgium, were used for routine passenger traffic. From 1903, the Company used the motor vessel “Grand Duke Alexander Mikhailovich” built at the Sormovo Shipyard, and from 1904, the motor vessel “Empress Maria Fedorovna” was designed and built.

At the end of the nineteenth century, the “K. and M.” Company became one of the leading transport companies in Russia. In 1884, it concluded a contract with Gryaze-Tsaritsyno Railway and the “Neft” (“Oil”) Partnership was established for the carriage of kerosene in bulk and delivery thereof to the market. Under the agreement with the Main Company for Russian Railways a direct transport link with Astrakhan and the Caspian Sea ports via Nizhny Novgorod was established. In 1898, a cartel agreement for the carriage of Central Asian cargoes was signed with the Eastern Warehouses Company (EWC) and with the “Nadezhda” (“Hope”) Company. The association was headed by “K. and M.”

The “K. and M.” Company also enlarged relations with Persian markets at this time. In 1901, it opened its agencies in Tehran, Mashhad, Rasht, and Kazvin. In 1903, the Company bought the controlling block of shares of the Persian Insurance and Transport Company and concluded contracts with EWC, “Nadezhda,” and the Russian Company for Marine, River, and Land Insurance and Transportation for establishing a syndicate to be headed by the “Bureau of Persian Cargo Carriers.” The syndicate obtained from the Russian Government a concession that belonged to it under an agreement with the Shah of Persia, enabling the syndicate to engage in operations on the territory of Persia as well as a loan to set up agencies for cargo warehousing and insurance in Persia.

In 1911, the passenger twin-screw motor vessel “Borodino” was built for the “K. and M” Company at the Kolomensk Machine-building Works, and in 1912 four more motorships were built.

Early in the 1910s, “K. and M.,” in association with EWC, bought all property of the major Caspian Shipping Companies “Nadezhda” and “Kura-Caspian Joint-Stock Shipping Company” as well as of the largest Volga Joint-Stock Passenger Shipping Company of M.K.Kashina (in all, 106 steamships and 37 wharfboats). In order to be able to operate and manage its own property, “K. and M.” and EWC established the main office of CAMBO, and in 1916, the Main Office of CAMBO headed by the chairpersons of “K. and M.” and EWC. Also in 1916, CAMBO bought Odessa Merchant Bank and the controlling blocks of shares of Dnieper Shipping Companies I and II, and established Mariinsk Shipping Company and the “Russian Lloyds” shipping company on the Black Sea. As a result, CAMBO received capital of Rbls. 35.5 million. A fleet of more than 900 steamships and 350 diesel locomotives was theirs. In 1918, CAMBO’s property was nationalized, and the Baku office of “K. and M.” existed until 1922.

Kayakent – balneological-mud health resort in Daghestan, Kayakent District, 95 km southeast of Makhachkala and 48 km northwest of Derbent city, near the Novokayakent settlement (railway station Kayakent). It is situated in the Circum-Caspian Lowland. The mean temperature in January is 1°C and in July is 25°C. Precipitation is 450 mm/annum. Main natural curative factors: mineral sources and peat silt mud (temperature – 35–42°C) of the small thermal lake Dipsus situated on the property of the health resort. There are numerous springs of cold and thermal mineral waters of varying chemical composition (among them sulfide, iodine-bromine, nitrogenous, and others). Mud therapy is carried out in the lake proper. Treatments are given for locomotive organs, the peripheral nervous system, the skin, and gynecological diseases. It is a sanitarium and hydropathic establishment.

Kazakh Bay – one of the major bays of the Caspian Sea’s eastern shore, it is in Kazakhstan between the capes Adamtash and Rakushechny. A. Bekovich-Cherkassky in 1715 was the first to map this bay under the name of *Kyzyl*, which means “red.” Later, in 1724, this bay was designated in maps under the name of *Peterbai*, or “Peter’s Bay.” In the map of I.V. Tokmachev (1731) it appeared as Kenzyrminskaya Bay. After 1917, the bay was named after the Kazakh Republic and at present is called Kazakhsky (Kazakh). It juts 46 km into the land. The width at the entrance is 83 km, and its depth is 7–32 m. There is a shallow bay Kenderli at the height of the bay, which is separated from KB by the Kenderli Spit. The shores, for the most part, are elevated.

Kazakhs (selfname – Cossacks) – a people and the dominant population of Kazakhstan. K. live also in Uzbekistan, Turkmenistan, Kyrgyzia, China, and elsewhere. In Kazakhstan live around 10.1 mln Kazakhs, in Russia live around 654 thou Kazakhs. Their language is Kazakh of the Kipchak group of the Turk Languages, and their religion is Sunni Muslim.

Kazakhstan – see *Republic of Kazakhstan*

“Kazakhstan Caspi Shelf” – international consortium established February 13, 1993 under a government program to develop the hydrocarbon potential of the Caspian Sea in the Kazakhstan sector. In June of 1993, a memorandum of understanding was signed, suggesting the establishment of an International consortium for the Geophysical Survey of the North Caspian. The Consortium comprised: DISC KCSH (operator), “Ajip” (Italy), “British Gas” and “British Petroleum”/“Statoil” (Britain/Norway), “Mobil” and “Shell” (USA), and “Total” (France), and in December an agreement on the establishment of the Consortium was reached. From August to October of 1994, KCSH and “Western Atlas” (USA) conducted pilot-methodological geophysical operations based on the special requirements of the North Caspian reserve zone. In February of 1995, Kazakhstan’s Ministry of Ecology approved the “Environmental Impact Assessment” made by “Arthur D. Little” (USA), and in April of 1995, DG Seis Company commenced geophysical exploration of the southern part and deep-sea zone of the northern part of the Caspian’s Kazakhstan sector. “Western Atlas” continued its operations in the

shallow-water zone. From 1994 to 1997, seismic prospecting in the sea was carried out, involving 26.2 thou linear km of seismic profiles. 96 oil and gas bearing reservoirs were discovered on an area of around 100,000 km²; a map of blocks for geological examination and development of hydrocarbons was made. On November 18, 1997, a Production Sharing Agreement for the Kazakhstan sector of the North Caspian was signed, and on May 20, 1998, the aforesaid PSA went into force. To go ahead with the exploration drilling stage, the PSA partners formed a consortium called the Offshore Kazakhstan International Operating Company (OKIOC), and all participants of KCSH became its members.

KCSH built an automatic data processing center in Atyrau, set up an online computer center in Alma-Ata, and built 4 laboratory and large-scale research buildings: 2 in Alma-Ata, 1 in Atyrau, and 1 in Aktau. The JCS has a specialized maritime fleet of up to 30 vessels.

Kazakhstan Fisheries Research Institute (KazNIRKh) – formerly the Ural-Caspian Division of CaspNIRKh. Research primarily deals with scientific substantiation of conservation, reproduction, and rational use of the bioresources of the Caspian Sea and the Ural River Located in Atyrau.

Kazi-Mohammad – city in Adjigabul District, Kura Lowland, Azerbaijan. It is a railway center (Adjigabul) and contains both dairy and fish-processing plants. There are fisheries on the Caspian Sea in the area.

“Kazmunaigas,” National Company – close joint-stock company established following the decree of the President of Kazakhstan on February 20, 2002 merging 2 national companies: CJSC OC “KazakhOil” and CJSC OC “Oil and Gas Transport.” The government of Kazakhstan is the only promoter and share-holder of the company. The company was established to integrate development of the oil-and-gas sector of Kazakhstan, to provide for rational and effective use of energy resources, and to establish socioeconomic development for Kazakhstan and integrate it successfully into the world economy. “K” comprises 2 oil-producing companies, “Uzenmunaigas” (ranking 3rd among Kazakhstan’s oil companies) and OJSC “Kazakh-Oil-Emba” (established in the summer of 1999 as a result the merger between JSC “Tengizmunaigas” and JSC “Embamunaigas”).

In November of 2001, Kazakhstan and Russia concluded a long-term (10 year) Agreement on cooperation in the gas industry. Within the framework of this agreement, in June of 2002, the joint venture CJSC “KazRosGas” was set up, its promoters being “K” (50%), OJSC “Gazprom” (30%), and OJSC “Rosneft” (20%). It was established to solve problems with gas transportation to Europe.

The “K” oil company built, in association with the Chinese National Oil Company, an internal oil pipeline, Kenkiyak-Atyrau, which is regarded as part of the main transport route from Kazakhstan to China.

“Kaztransoil” – Kazakhstan national company operating on the market of oil transportation via pipelines, transports around 80% of the recovered oil. Represents the interests of Kazakhstan Government in international pipeline projects. The

strategy of company activity is forged under the influence of the following main goals: increasing export of Kazakhstan oil to foreign markets, optimizing the production structure of oil supply on the domestic market, and enhancing operational reliability and safety of main oil pipelines.

“K” operates three independent process systems of main oil pipelines. The traditional routes of Kazakhstan oil transportation pass through the territory of Russia and along the Caucasus transportation corridor. The bulk of export volume bound for the foreign market is transported via the Atyrau-Samara oil pipeline and on over the system of “Druzhba” (“Friendship”) oil pipelines. The key component of setting up a multipolar commercial system of pipelines for exporting oil from Kazakhstan is the implementation of the CPC project. An option is being examined of building the Aktau-Baku transcaspien oil pipeline and on to Supsa (Georgia). Additionally, it has been announced that the CPC system will join the Baku-Tbilisi-Ceyhan pipeline.

Kenderli Cove – see *Kazakh Bay*

Kenderli Spit – located at the end of Kazakh Bay, it separates Kenderli Cove from the sea. The spit is structured by sand and coquina; its surface is covered with bulrush and shrubs. There is a chain of mounds almost in the middle of the spit. At the foot of the spit the shore of the mainland is steep.

Khachmas – a city (from 1938) and the center of the Khachmassky Region in Azerbaijan. It is located on the Kudialchai River (flows into the Caspian Sea) in the Caspian area. It is a railway junction with a population of 37 thou people. A canning plant (vegetables and fruits processing) is there. It has railway enterprises and a plant for manufacturing glass containers.

Khadji-Tarkhan, Khadjitarkhan – see *Astrakhan*

Khaki, Sor – sometimes “solonchaks, saline mud” (khaki), located in the Circum-Caspian Lowland in the West-Kazakhstan Region. On the east it is confined by the Naryn sands. It represents a large land lowering that extends from the northwest to the southeast for about 100 km. Its width is about 10–20 km. It is composed of saline mud and is covered with a halite crust.

Khanykov Nikolai Vladimirovich (1822–1878) – Russian geographer, ethnographer, orientalist, researcher of Middle and Near Asia. In 1841–1842, he took part in the expedition to Bukhara, and in 1943 he published his work “Bukhara: Its Amir and Its People.” He studied Caspian water level fluctuations in retrospect from 915 to 1852 and published for the first time the results. He was the first to relate the water level fluctuations to the climate. In 1852, he studied northwestern Iran and prepared a map of the Lake Rezaiyeh basin. In 1858–1859, he led the so-called Khorasan Expedition of the Russian Geographical Society that, as British researchers noted, “changed completely our notions about the orography of Eastern Persia.” At the end of this journey he crossed the Dasht-e Lut Desert in Iran. He is buried in Per-Lachez cemetery in France. A modest monument designed by sculptor M.M. Antokolsky was installed on his grave with money collected by

I.S. Turgenev, a great Russian novelist. On the gravestone is carved a book and a map of Persia with the provinces bordering on the Caspian Sea. His most important works: “Bukhara: Its Amir and Its People” (1843), “On fluctuations of the Caspian Sea level,” “Mémoire sur la partie méridionale de l’Asie Centrale” (1861), “Mémoire sur l’ethnographie de la Perse” (1866).

Khapuzhsky Sea – see *Caspian Sea, Names*

Kharabali – the center of the Kharabali District, Astrakhan Region, 142 km to the northwest of Astrakhan. It is located on the left bank of the Akhtuba River (Volga arm) in the Caspian area. The Kharabali railway station is there. The population is 18.1 thou (2009). It was founded in 1770, but has only been a city since 1974. It has a vegetable canning plant, forestry enterprises (commercial timber, articles of willow, baskets, vases, lamp shades and others), and a brick plant. A regional historical museum is there. Vegetables, watermelons, and rice are grown here. Rearing of sheep, camels, and horses is also developed. Sand and clay deposits are found there. Sarai-Batu, the former capital of the Golden Horde, an archeological monument of the thirteenth century, is located 40 km southward of Kh. The Kalmyk Buddhist monastery (built after 1812) is located 70 km to the south of Kh.

Khazar – formerly Cheleken City, Balkan velajat, Turkmenistan. It appeared in the late seventeenth century as a settlement near oilfields. In 1956 it acquired the status of a city. It is located in the western part of the Cheleken Peninsula on the Caspian coast, 80 km south of Turkmenbashi. Production of oil, mineral wax, iodine, and bromine is widely developed here. A large chemical plant is located in the city. An airport is 2 km from the city. In 2001 the city was given the name Khazar.

“**Khazar**” – the scientific center for study of the Caspian Sea established in 1995 by the decision of the Parliament of Iran.

Khazar Canal – Masudi, the “Arabian Herodotus,” called the waterway between the Black and Caspian seas by this name. He also called it “the canal of the Nitos Sea.”

Khazar Eli (Turkmen “*Khazar*” – from the ancient name of the Caspian Sea, “*el*” (Turk.) – wind) – the western wind in Turkmenistan that blows from the Caspian Sea.

Khazar Khaganate – a state that existed in the mid seventh to late tenth centuries ruled by Khagan. Its capital was Semender and then from the early eighth century, Itil. In the early eighth century, it controlled the territory between the two seas, Caspian and Black, the Northern Caucasus, Circum-Aral area, a great part of the Crimea, and the steppe and forest-steppe territories as far as the Dnieper River. It had trade relations with the peoples of Eastern Europe, Central Asia, Transcaucasia, and others. The main religions were Judaism, Islam, and Christianity. In 943, the Russians destroyed the main city of Khazars, and in 964–965, Grand

Prince Svyatoslav Igorevich crushed the Khazar State. It is thought that one of the main causes of Kh.k. disappearance was a large transgression of the Caspian in the tenth century during which the Caspian sea level rose by 7 m (from –32 to –25 m).

Khazar Nature Reserve (before 1994 – Krasnovodsk nature reserve) – comprises two divisions: Gasan-Kuli (69.7 thou ha) established in 1933 (by Orders of the People’s Commissar Council of TSSR No. 252 of October 3, 1932 and No. 2472 of November 13, 1933) and Krasnovodsk (192.3 thou ha) established in 1968 (by Order of the Council of Ministers of TSSR No. 288 of July 10, 1968). The nature reserve was created to protect and study the largest hibernation places of water fowl and near-water birds in the southeastern Caspian. Nearly 80% of the nature reserve is occupied by a shallow water area. The maximum absolute elevation of its territory is 282 m (Kalidag Mountain in the Krasnovodsk area). The landscape in the Krasnovodsk area consists mainly of sandy islands and bars overgrown with halophyte plants, the coastal sandy desert in combination with sandy solonchaks, and small residual hills. K.N.R. also includes the nature preserve on Ogurchinsky Island. Before the breakdown of the Soviet Union under the Ramsar Convention, the greater part of the Krasnovodsk nature reserve was included into the protected wetlands being of international significance as habitat of the water fowl and near-water birds. At present this status has been lost because Turkmenistan has not yet ratified the Ramsar Convention. From 1968 (after creation of the Krasnovodsk area) the territory of the nature reserve has not changed.

Khazar Sea – name for the Caspian Sea in Azerbaijan, named after the “Khazars”, a Turkic people who lived from the fifth to tenth centuries on the northwestern coast of the sea.

Khazar Shipping Company – one of the affiliates of the Corporation “Shipping Lines of the Islamic Republic of Iran”. It was created in 1992. It has 6 cargo vessels: “Iran Beseer” – 2,885 t, “Iran Ghadeer” – 3,955 t, “Iran Basheer” – 3,955 t, “Iran Daleer” – 2,495 t, and “Iran Kabeer” – 5,885 t. They travel among the Iranian ports – Anzali, Nowshahr, Neka, and they also go to Astrakhan, Makhachkala (Russia), Aktau (Kazakhstan), Turkmenbashi (Turkmenistan), and Baku (Azerbaijan).

The Company is a member of the Islamic Shipowners Union, and thus provides additional services to the cargo owners in different industries and to merchant companies. The Company’s headquarters are in Enzeli, while offices of the Company are in Tehran, Nowshahr, and Neka. There are also offices in foreign countries, such as Moscow and Astrakhan (Russia), Aktau (Kazakhstan), and Baku (Azerbaijan).

Khazar Transgression – see *Transgression of Khazaria*

Khazaria – (1) the area where Khazars roamed in the seventh to tenth centuries (Lower Volga, Don, and Northern Caucasus); (2) territory subjugated to the Khazars; (3) from the tenth century the eastern part of the Crimea was sometimes called Kh.



Khazaria (<http://zarubezhom.com/Images/khasars2.jpg>)

Khazars – the Turkic people forming the independent and strong tribe that appeared in Eastern Europe after the Hun invasions in the fourth century. They were nomads and roamed over western and Circum-Caspian steppes. They established the Khazar Khaganate. Al-Istakhri wrote the following in his “Book of Climates”: “As for the Khazars, this is the name of a tribe and not of the capital. The name of their capital is Itil. It has got its name from the river that flows over their territory to the Khazar Sea or as we call it the Caspian Sea. The Khazars populate the territory confined by the Khazar Sea, Rus, Russia and Serir or Sarbar.” The first significant appearance of the Khazars in history is their military campaign against the Arabs and their alliance in 627 with Byzantine Emperor Irakli. They practiced a religion that is unknown at present.

“**Khazovsky**” – a monument of nature located within the border of the wetlands “Volga Delta”. It is used for protection of nesting colonies of copepoda and ciconiiformes birds.

Khazri (Azeri) – “Baku nord”, a storm northern wind on the Apsheron Peninsula bringing cold air and snow in winter and dryness in summer.

Khlebnikov Velimir (Victor Vladimirovich) (1885–1922) – the “genius of the delta” of the Volga and outstanding poet of the twentieth century. He was born in the Kalmyk steppe and grew in Astrakhan. From his childhood, he was fascinated with the Caspian views. His Kh. ancestors by his father’s line were connected with the Caspian merchant way. The grandfather of the poet was a merchant and owned ships. His uncle was awarded the title of the Astrakhan’s honored citizen: he persuaded the Astrakhan merchants to donate many bags with wheat flour for protection of the city from inundation. The father of Kh. was a well-known ornithologist who had founded the Astrakhan nature preserve. The innovative poetic language of Kh. appeared as a result of everything he saw and heard in the Volga delta – the birds’ Eden and multi-voiced Astrakhan floodplain. He was the author of the poems about World War I, the 1917 Revolution (“Night before the Soviets”, 1921), and poems “Khadji-Tarkhan.” In Iran, Kh. was called “Gulmulla,” meaning “the priest of flowers.”

Khlebnikov V.V.
(<http://www.agkg.narod.ru/filial/img/0.jpg>)



Khorezm Sea – see *Caspian Sea, Names*

Khorosansky Sea – see *Caspian Sea, Names*

Khudat – a city (from 1950) in the north of Azerbaijan, the center of the Khudatsky Region. It is located in the lowland near the Caspian Sea coast. It has a railway station and food industry.

Khudat-Yalaminsky Seashore – the maritime climatic resort zone on the Caspian Sea in Azerbaijan, to the northwest of Baku and in the northeastern part of the Samur-Divichinsky Lowland (between settlements Yalama and Khudat). Mild subtropical climate (mean temperature in January, 3°C; mean temperature in June, 27°C), warm sea, and sandy beaches (about 10 km long and to 500 m wide) make this area the center of aerohelio and thalasso therapy. Many rest houses and tourist camps are found here.

Khvalissky Sea – see *Caspian Sea, Names*

Khvalynsky Sea – see *Caspian Sea, Names*

Khvalynsky Transgression – (derived from the ancient name of the Caspian Sea, Khvalyn) – Late Quaternary (30–12 thousand years ago) transgression of the Caspian Sea, when it reached its maximum size and covered the Circum-Caspian Lowland up to 51°N. There were two phases. Thickness of its deposits is 10–20 m. The sea level reached the absolute elevation of about 50 m.

Kigach – gut of Volga's arm Buzan, stemming from the Akhtuba arm. Flows across the Astrakhan (Russia) and Atyrau Regions (Kazakhstan). The source of K.'s alimentation is flood water from Buzan and Akhtuba, though during the low-water period on from Buzan. In the vicinity of the Shortambai Settlement, the large gut Sharonovka branches off K. to the left, flowing into the Caspian Sea. Around Damba Settlement, another gut of Buzan–Sumnitsa Shirokaya flows into K., and as a result the discharge of the former doubles. The gut's water also goes into the sea via Igolkinsky Canal. Water level variations in the guts are mainly conditioned by the Volga flow.

Kir – natural mixture of semi-liquid asphalt with dust and soil deposits or sand soaked with jellied oil. It is encountered on Cheleken, Turkmenistan. Earlier, thanks to its water-proof properties, K. used to be applied to the flat roofs of local buildings (e.g. in Baku).

Kirov Bay – see *Kyzyl-Agach Bay*

Kirzhim, Kirshim, Kurzhum (Pers. – *kerdji*) – small sail-and-rowing boat for navigation along the coast and for moving cargoes and fishing in the southern part of the Caspian Sea. Its length is 4.5–8.5 m. and has a crew of 3–4 people. K. had an upright sail. A flat boat, its sides were sewn on to the bottom with comel roots. The grooves were filled with oil-soaked felt. K. was made of lime-tree, walnut, or Persian oak, and was often used to move cargoes from the sea ships onshore in shallow-water.

Kizlar – (Turk.) “girls” – One of Daghestan's oldest cities and a city of republican subordination at the center of the Kizlar District, 170 km north-west of Makhachkala. Situated in the Circum-Caspian Lowland on the low-lying left bank in the Terek River delta. It has a railway station on the Gudermes-Astrakhan line and is highway junction. Its population is 51.6 thou (2009). In the sixteenth century in the vicinity of the present-day K., Russian frontier fortresses Terki-1 (1567), Terki-2

(1579), and Terki-3 (1589) were built. The K. settlement is first mentioned in 1652. It was devastated by a flood in 1729. In 1735, the General-in-Chief, V.Ya.Levashov, founded the Russian fortress K. which began the establishment of a system of frontier Caucasus fortifications. In the 1740s, a fortress from St. Cross (on the Kuma River) was transferred here; that fortress had been built on the left bank of the Terek River. At that time, the tsarist government gave up Daghestan as the cost of maintaining troops was too much of a burden; therefore, the frontier was moved to the Sulak River. Nowadays, there is almost nothing left of the Kizlar Fortress. From the second half of the eighteenth century, K. was one of the crucial centers of trade between Russia and the countries of the Near and Middle East (in 1755, Russian Border Customs were established in K., and in the second half of the eighteenth century, there was a community of Indian merchants in the city). From 1785, K. was a provincial city of the Caucasus Governor-General. In 1798, a large number of Armenians from Nagorny Karabach, who fled from Turkish and Iranian troops for fear of being exterminated, resettled here. In 1831, during the Caucasian War, the city was ravaged by mountain-dwellers, but was soon built anew. Since the 1860s it has been the center of Kizlar District of the Tersk Region. In 1922, K. together with the District was included in the Daghestan ASSR, and between 1937 and 1944, it became part of Ordzhonikidze (Stavropol) Territory. In 1944 it was included in the Grozny Region, and in 1957, K. was again given to Daghestan.

From the early nineteenth century, K was the center of a large district featuring vine-growing, wine making (in 1895, there opened the first Russian wine-making school), fishing, and fish sales. Also popular in the territory were horticulture, vegetable growing, melon growing, paddy cultivation, and sericulture. Earlier, the territory was famous for its wine trade, the purchase and sale of seafoods, and liquorice. There used to be up to 10 brandy and wine distilleries. K. used to be surrounded by vineyards, most of which have since been reduced. It has sources of thermal waters. An archeological monument, the Nekrasov settlement site (second to third centuries), is 5 km southeast of Nekrasovka village. Remains of the “Three-Wall Town” are still there. This monument dates back to the sixteenth century and is situated east of K. between Alexandriiskaya and Krainovka Cossack villages.

In 1765, L.I. Bagration, Hero of the 1812 Patriotic War, was born at the K. fortress. The fortress is a home-museum now. In 1836–1838, the fortress Governor was P.A. Katenin, a poet, translator, critic, and man of theater. At different times, K. was visited by A.A. Bestuzhev-Marlinsky, M.Yu. Lermontov, L.N. Tolstoy, A. Dumas Sr., the surgeon N.I. Pirogov, and others.

Kizlar Bay – bay of the Caspian Sea, Daghestan. Juts 13 km into the northwestern seashore, with width at the entrance of 46 km and a depth of 0.5–2 m (varies significantly under the impact of wind-affected phenomena). KB’s coastal strip area is 18.5 thou ha and is a low-lying plain with an elevation of up to –28 m relative to ocean level. The seashore has been a seabed several times, due to multiple transgressions and regressions of the Caspian Sea. For this reason, the seashore is structured by sea sands, clays and small coquina, and is complicated by numerous brackish lagoons. Even at present the bay seashores are rather boggy: as soon as

“moryans” (winds from the sea) start blowing, the shores is flooded. In winter, the bay freezes. The shallow-water reaches of the bay are the habitats and spawning grounds of sturgeon, stellate sturgeon, bream, roach, and other fish species. Plavni of KB are the paradise for the waterfowl. The most common species of nesting fowl is coot, a matted-black waterfowl the size of a small duck. Cane thickets abound in gray geese, mallards, gray ducks, teals, shovellers, and red-crested pochards. Little and great white herons, rare spoonbills, and glossy ibises are entered in “the red-data books,” and there are also small colonies of herring gull and gull-billed tern. Data are available of discovered nests of gray heron and Dalmatian pelican, species which are also entered in Russia’s “Red Data Book.” The largest of swans, the mute swan and the pintail, winter here. KB is part of the Daghestan State Nature Reserve. Also under protection is the 2-km wide strip along the shore of the sea water area. Morskoi Biryuchok Island is in the northern part of the gulf.

Knipovich Nikolai Mikhailovich (1862–1938) – zoologist, hydrobiologist, and head of the Russian school of ichthyologists and organizer of science-based fishing and research into the USSR seas. Corresponding member (1927), honorary member of USSR Academy of Sciences (from 1935). Honored worker of science and technology of the RSFSR (from 1935). From 1911 to 1930, he was professor at a medical institute. He headed a number of science-based fishing expeditions (from 1898 to 1932) to study the Arctic Ocean, Caspian (1886, 1904, 1931–1932) and Black, Azov, and Baltic Seas. In 1912–1913, he was the head of expeditions on board the ships “Abo,” “Ani,” and “Aleksi Ermolov,” and in 1914–1915, he was on board the “Abo” ship on the Caspian Sea. The main task of the expedition was to study the Caspian herring; however, K. considerably enlarged the scope of his research, seeking to cover all aspects of Caspian biology. He managed to cover the basic features of hydrological regime of the Caspian and its components; clearly demonstrate the relation between the sea hydrology, chemistry, and biology; and obtain new data on vertical distribution of temperature, salinity, oxygen content, and penetration of life in the deep-water parts of the sea. On the strength of the obtained data, the water mass of the Caspian Sea was subdivided into vertical zones. By and large, K’s studies contributed enormously to the knowledge of the Caspian Sea nature. He was the first to provide a scientifically-based evaluation of Caspian fishing production and determined the ways to regulate fishing and protecting the fish reserves of this water body. The findings of these expeditions were summarized in the monograph “Hydrological Research in the Caspian Sea in 1914–1915” (1921). The monograph was conceived as Volume I of “Transactions of the Caspian Expeditions of 1914–1915.” In 1921, in the series “Essays on the Nature and Fisheries of the Russian Seas” one other generalizing work by K., “The Caspian Sea and Its Fisheries,” was released. In 1902, he was awarded the F.P. Litke medal by the Russian Geographical Society for hydrological research in the North, and in 1924, he was awarded a Large Gold Medal for combined works on hydrology.

Kokorev Vasili Aleksandrovich (1817–1889) – a prominent Russian entrepreneur, oil industrialist, public figure, and commercial adviser (1851). Had no formal education. Between 1836 and 1841, he was the manager of a salt-making plant at

Soligalych of Kostroma Province. From the 1840s, he traded with Persia (export of Ural iron; import of cotton) and made a fortune (especially during the Crimean war), which enabled him to take up trade-and-industrial activity from the end of the 1850s. Made heavy investments in the construction of the Volga-Don transport route. Founded the Transcaspien Commercial Partnership (1857), and participated in establishing the Russian Shipping and Trading Company (1856), the Volga-Caspian Shipping Company “Kavkaz i Merkurii” (“Caucasus and Mercury”), and the Volga-Don Railway Company. In 1859, he built at Surakhany near Baku the first oil refinery for the production of kerosene, with oil-processing capacity of over 1.5 thou t of oil (from 1874, it belonged to the Baku Oil Company that he had founded). He was engaged in large-scale construction business, and he founded several banks in Moscow and Petersburg. Active adherent of D.I. Mendeleev in the struggle for cancellation of a farming-out system in Russian oil business. Participated in the establishment of Moscow Merchant Bank (1866). In 1870, in association with other Moscow entrepreneurs, he founded the Volga-Kama Bank that leant resources to the oil sector. K. took up an art collection (around 500 works by Russian and West-European painters, and in it K.I. Bryullov’s oeuvre is best represented; the collection was open to the general public in 1862–1870 and became one of Moscow’s first public museums. Due to financial problems, K. sold part of his collection to the Imperial Court Ministry, P.M. Tretyakov, and D.P. Botkin. K. financed the training of some artists abroad on probation. In 1899, K. was awarded the title of an honorary member of the Academy of Arts. He was the author of the book “Economic Failures” (1887).

Kolodkin Aleksei Emelyanovich (1775–1851) – Russian hydrographer. The Admiralty Board commissioned K., a grade 8 navigator, to draw a map of the Caspian Sea. For accurate determination of geographical latitude and longitude of objects being observed, a proposal was made for him to make astronomical measurements using state-of-the art instruments. In 1798–1800 as a navigation officer, he sailed near the shores of England and Holland. In 1802–1804, he performed a series of hydrographic operations on the Baltic Sea. Then he worked as the head of the drawing team of the Admiralty Department. From 1809 to 1817, K. explored the Caspian Sea and its seashores. During this period, he made tables of the coordinates of 46 geographic locations. His long-term studies resulted in the publication of the “Atlas of the Caspian Sea” made up of 17 maps and released in 1826. In 1835, K. managed the Hydrographic Department, and in 1840, he was promoted to the rank of Major-General of the Naval Navigators Corps. One of the rivers on Novaya Zemlya that flow into the Kara Sea is named after K.

Kolok – brushy shoal in the sea; a bunch of bulrush growing out of the water.

Kolzum – name given to the Caspian Sea by Persian seafarers.

Komsomolets – bay near the northeastern shore of the Caspian Sea, Mangistau Region, Kazakhstan. In the 1940 s, the greater part of the bay turned into an extensive salinized area – sor Dead Kultuk. K. bay area has shrunk from 15,000 to 500 km². At the entrance to the bay is Durneva Island.

Komsomolsky – settlement in Kalmykia, the center of Chernozemelsky District, 204 km southeast of Elista and 68 km to the west of Ulan-Khol railway station. Its population is 4.2 thou people. It was established in 1951. In K. there is a district industrial combined works, a bread-baking plant, and other enterprises. The main CPC oil pipeline passes via K. In the district, they grow fodder, vegetables, and melon crops. There is cattle-, sheep-, camel-, and horse-breeding in the district. An oil and natural gas field and the nature reserve “Black Lands” is here.

Krasnovodsk – see *Turkmenbashi*

Krasnovodsk Herring (*Alosa brashnikov nirchi*) – large herring with a slender body. The head and back are of light tones with a greenish tincture. The fish has 21–31 gill rakers, and 48–52 vertebrae. Its body length averages 30 cm. The fish dwells near the eastern shores, from Iranian waters in the south to Kenderli Bay in the north. KH spawns near the shores of Kenderli and Krasnovodsk Bays from April to June and probably in other coastal areas of the sea, too. Fish of spring and summer spawning belong to different fish stocks. KH reserves are not abundant.

Krasnovodsk Peninsula – situated on the eastern shore of the Caspian Sea, Turkmenistan. Its length is 85 km, and its width is 80–140 km. It is washed on the north by Kara-Bogaz-Gol Bay, and on the south by Turkmenbashi Bay (formerly Krasnovodsk Bay). Nearly all of KP is occupied by the Krasnovodsk Plateau (height up to 306 m). The western part of KP is covered with the sands of the Oktukum Desert, and the eastern part with sands of the Chilmamedkum Desert. The climate is continental, desert (mean temperature of July around +28°C, of January +2°C; precipitation is around 100 mm/annum). The soils are gray-brown, solonertz-like. Sagebrush and saltwort vegetation grow. On the southern shore, the city and port of Turkmenbashi is located.

Krasnovodsk Plateau – southern margins of the Ustyurt Plateau situated on the Krasnovodsk Peninsula on the eastern shore of the Caspian Sea between Turkmenbashi Bay (formerly Krasnovodsk Bay) and Kara-Bogaz-Gol Bay in Turkmenistan. Its height is under 306 m (in the south), where the plateau turns into chink Kureningkuresi. The most notable feature of this formation is the border escarp ledges. In the east, the plateau height decreases and becomes the sand tract Chilmamedkum. Flat uplands alternate with wide flat degradations (up to 10–15 km in diameter) and are characterized by rocks of up to 40 m in relative height. The plateau is structured mainly by limestones and marls with gypsum. Vegetation is that of a clay and stony desert, and in the northeast are solonchak basins.

Krasnovodsk Region – instituted on April 4, 1952, abolished on December 6, 1955, and re-established on December 27, 1973. Abolished in 1991 pursuant to the Constitution of Turkmenistan of 1992. KR is now called Balkan Velayat.

Krasnovodsk Reserve – see *Khazar Nature Reserve*

Krasny Yar (“Red Dene”) – village in the Astrakhan Region, the center of the Krasnoyarsk District, 35 km northeast of Astrakhan, which is the nearest railway station. It is situated on an island surrounded by Volga arms: Buzan, Akhtuba, Mayachnaya, and Prorva. The population is 11 thou people (2002). It was established in 1667 as a Russian guard point for protection from incursions of nomads. The early settlers were Cossacks. The existing enterprises are a brickyard, a vegetable-canning factory, a butter-and-cheese plant, and the forestry administration. Also there are smoked-fish and sausage goods factories and a confectionery plant. In the center of KY is a historic architectural complex.

Krasnye Barrikady (“Red Barricades”) – settlement situated 25 km downstream of Astrakhan Port.

“Krasnye Barrikady” – JSC, a shipbuilding yard in Astrakhan. Established in 1886 by the Uniatov Brothers as a ship-repair workshop. Located closest to the Caspian Sea on zero elevation of the Volga-Caspian Canal, it has no limitations in terms of power-transmission lines for the passage of ships of large overall dimensions; also, there are no bridges downstream of the JSC and the water area makes it possible to continue work even in winter time. In 1974, the first floating drilling rig, “Baku,” was built here, followed by the construction of 8 more similar rigs for Azerbaijan. Early in the 1980s, the JSC merged with the Marine Ship-building Works “Elling.” In the mid-1980s, the construction of one rig took 2 years on average. In 1986, the “Lotos” plant joined the Works, which enabled the association thus formed to manufacture one FDR of “Caspian” type for the oilmen per annum. In 1995, the Works became one of the founders of the JV “Astrakhan Korabel” (“Astrakhan Shipwright”). KB is the leader of shipbuilding for the oil and gas sector in the Caspian Sea basin. The plant’s primary items are floating drilling rigs and crane ships.

Kuandy – basin in the south of Mangyshlak Peninsula, 15 km from the Fetisov Settlement, in Kazakhstan. It runs in a northwestern direction and is around 35 km long, with an average width of 15 km. The minimum absolute elevation of the bottom is –54 m. On all sides (except the southwest) the basin is limited by a steep – in places upright – precipice with a relative height of 130 m. The southwestern half of the basin is occupied by hayfields.

Kukan – fish line on which caught fish are impaled through their mouths and gills to put in water and keep them alive.

Kulaly – island in the North Caspian. The largest in the group of Tyulenii Islands, Kazakhstan. Its area is around 68 km², and it is structured by sands and some clay deposits. In the central part are sand mounds of 6–8 m in height. It is covered with semi-desert vegetation. Fishing is done along the island.

Kulaz, Kulas – sail fishing boat for fishing with hook and line gear. Its length is about 6.5 m, width is 1.2 m, and draft is 0.2–0.3 m, with a 1.0–1.3 tonnage. It used to be common in the southern part of the Caspian Sea.

Kuli-Darya – (kuli sea – “a sea of fish”, “servant of the sea”) – Turkmen name for Kara-Bogaz-Gol Bay.

Kuli-Mayak – township on the Caspian shore, Balkan Velayat, Turkmenistan. It has developed on the basis of kitchen salt recovery and is located 16 km from the salt field.

Kultuk – bay of a sea or lake that is mainly shallow and enclosed. It is often used in the Volga Basin in the following meanings: “corner bay,” “dead end of bay,” “broadland”; “ilmen” – on the Caspian Volga coast; “dry gut”, “hollow in the Volga “yar” produced by bank erosion”, “dry gut of a river”, “dead-end termination of a ravine”. Shallow bays (0.5–1.5 m deep) in the Volga delta overgrown with bulrush and cattail, they are hardly-flowing or standing water bodies. There is a kultuk zone distinguished in the Volga mouth, which is a transition from the delta above-water part to subwater part – mouth offshore (or delta front). K. Zhiloi, Ninth – North Caspian; Sazanii K. stow, Dead K. – Bay of the Caspian Sea in Kazakhstan.

Kultuk Zone – permanent shallow water body with an enormous number of spits and islands.

Kulzum Sea (red sea) – historians An-Nasawi and Sharafuddin Yezdi used to refer to the Caspian Sea in this way in the fourteenth to fifteenth centuries. The name was in common and is referenced in the seafarer’s manual written by Ahmad ibn Majid (fifteenth century). He calls the Caspian Sea the Kulzum Sea of Non-Arabs.

Kuma – river of the Caspian Sea Basin, Russia. Turk nomads during the Middle Ages used to call it Sandy River (from the word *kum* – “sand” or from *kzum* – “wave”, later *gum* – “water, river”), because it flows across sandy locations. Claudius Ptolemaeus used to call it “Oidon.” In the lexicon of Iranian-language tribes (Scyths, Alans, Savromats, Sarmats), the root of this word means “water.” According to one legend, in ancient times, a woman-warrior by the name of Kume, having found a ford in the river, managed to take her combatants out of an entrapment. Since then, allegedly, the river has been called after that woman. K. originates in the northern slopes of a rocky ridge and flows amid the steppes of the Northern Caucasus. As the river reaches the Circum-Caspian Lowland, it breaks into arms. In its lower reaches, it runs along the southern border of Kalmykia and flows into the Caspian Sea south of Dargin Shoalbank Bay, though it usually does not reach it because much of its waters are drawn for irrigation. The river’s length is 802 km, and its basin area is 33.5 thou km², with a mean discharge in the upper reaches of 11.9 m³/s. K.’s waters are distinguished by high turbidity. Its main tributary is the Podkumok. K. waters are used for irrigation (Terek-Kuma and Kumo-Manych Canals). Otkazninsk Storage Reservoir is built on the Kuma.

Kuma Plavni – water-logged space in the lower reaches of the Kuma River in the North Daghestan Lowland. Some areas of the marsh land as far as Agrakhan Bay are recharged with Caspian Sea waters. KP is heavily overgrown with cane and other mire vegetation.

Kumani Feodosii Nikolaevich (1830–1889) – Russian seafarer and researcher of the Caspian. In 1854, in the rank of a Lieutenant and being the commander of a battleship, he fought on the Black Sea near Ochakov with a British-French force of ships. In 1855, he took part in the heroic defense of Sevastopol. From 1861, he served on the Caspian Sea as the commander of schooners “Turkmen” and “Persiyenin.” He wrote descriptions and measured the sea. That same year he discovered a new island of mud-volcano origin in the Baku Archipelago. The island was later named after K. Subsequently, the island was scoured and became a shoal-bank. From 1870 to 1873, as commander of the screw-propelled clipper “Izumrud” (“Emerald”), K. traveled from Kronshtadt to the Pacific and sailed in tropical seas, and at the end of 1872–early in 1873, he removed N.N. Miklukho-Maklay from New Guinea. K. explored the strait separating Karkar (Dampir) Island from New Guinea, which was later named Izumrud Strait after his ship. While K. was in transit, he was promoted to Captain 2nd rank, and when he returned – for distinctions – he made Captain 1st rank. Later, K. was promoted to the rank of Rear-Admiral.

Kumani Shoalbank – situated in the Baku Archipelago. It was mapped in 1861 and named after F.N. Kumani.

Kumbashi – the only one of the numerous rivers flowing into Maly Kyzylagach Bay that is still used for commercial fishing. K. originates from the Boradygyakh River. Its total catchment area is 400 km² and its length is 12.5 km. The width in the lower reaches is up to 30 m. The river mouth juts 1.5 km into the bay. The annual flow varies depending on the water availability in its tributaries. The water regime is characterized by spring and autumn floods and by the low-water period during the rest of the year. In summer, the river almost runs dry. K. is the main spawning ground of the Black Sea roach.

Kumyk Plain – popular name for the Kumyk flatland or Kumyk Steppe situated in the northwestern part of the Terek-Sulak Lowland in the interfluves of the Terek and Sulak Rivers. It is a sub-district of the Terek-Sulak Lowland. Its area is 3,800 km². A drop of KP elevation is noted from the southwest to the northeast. The mean slope from the west to the east equals 0.4–0.5 m/km. It was structured by alluvial deposits of the Terek, Aktash, Aksai, Shuraozen, and other rivers. The general plain-like character is upset by elongated depressions, saucer-like drops, steppe saucers, hollows, sandy hill uprisings, and high tumuluses. Common in the maritime part are sandy uprising and hummocky muddy sands. There often occur large tumuluses (*tyube* – Kumyk), which at times reach heights of 8–10 m. KP is used for irrigated farming.

Kумыкs – a people in the RF (total of 422.4 thou people in 2002): Daghestan, Chechnya, Ingushetia, and North Osetia. K. began taking shape in the 2nd half of the first millennium. The aborigines of the Daghestan Plain played a decisive role in the ethnogenesis of K. Alongside the aborigines, the newly-arrived Turk-Language tribes were also instrumental in forging the K. people. This is particularly true of Kipchaks (Polovets people) whose language was accepted by the local tribes. Thus

the Kumyk Language of the Kipchak group of the Turk languages emerged. There are three dialects at present: Khasavjurt, Buinak, and Kaitab. Their religion is Sunni Muslims.

Kura – the largest river in the Caucasus and second largest in the Caspian Sea Basin. Its catchment area is 188 thou km², and its length is 1,515 km. It flows across the territory of 5 states. The distribution is as follows: Iran – 40 thou km², Turkey – 28.9 thou km², Azerbaijan – 52.9 thou km², Georgia – 36.4 thou km², and Armenia – 29.8 thou km². It originates on the Kyzyl-Gaduk slope in Turkey, where it flows over a distance of 174 km. The rest of the river runs through Georgia – 426 km and Azerbaijan – 915 km. Over 65% of the basin area (122.2 thou km²) is at the height of 500 m above ocean level and constitutes the area of flow feeding and transit, while 35% (68.5 thou km²) are of flow reshaping and losses. In the upper reaches (from the river source to the Borzhomi gorges) and as far as Akhdaby-Khashuri City (Georgia), the river makes its way through narrows and deep canyons, and in its middle course (as far as the Mingechaur Storage Reservoir) it takes in a number of rivers of the Minor and Greater Caucasus. In the downstream segment of the river (up to inflow in the Caspian Sea), more than half of the river flows over the alluvial lowland structured by river deposits, separating the Shirvan Steppe from the Mil-Karabakh and Mugano-Salyan Steppe. Here, K. flows slowly and meanders, leaving behind numerous ox-bow lakes and depositing a large amount of clay material. K. also takes in its largest tributary here, the Araks River. The mean runoff is 15.5 km³/annum, and sediment runoff is 17.1 million tons per annum. Sources of K. alimentation are waters of snowmelt (36%), ground water (30%), rain water (20%), and glacier water (14%).

Kura River
(http://www.khalilov.az/blog/wp-content/2008/08/_dsc5168.jpg)



Kura-Araks Lowland – situated in the area of the lower reaches of the Kura and Araks rivers between the Greater and Minor Caucasus within Georgia, Azerbaijan, and Iran (Iranian Mugan). In the east, it is washed by the Caspian Sea. Its length is 250 km, and its width is 130 km, with an area around 3 million hectare. Its heights are lower than 200 m in the middle, and its eastern parts are below ocean level.

The lowland is structured by Quaternary sea and alluvial-proluvial deposits. The climate is dry and subtropical. The mean temperatures in January are above 0°C and in July fluctuate between 22 and 26°C. Precipitation is 200–400 mm/annum. The summer dryness of KAL and of the contiguous Apsheron-Kobystan District and Circum-Kura inclined plain determines the semi-desert (desert) nature of the landscape. KAL ground water is mostly saline and is characterized by a chloride type of salinity that gives way to a sulfate type around the periphery of the lowland. The sources of salinity are the salts brought in by ground and surface water from the Minor Caucasus and northern uplands. The saline ground water coming up close to the land surface are conducive to salinization of all KAL soils and the development of semi-desert solonchak landscapes. Besides solonchaks produced as a result of soaring ground water in the southwestern parts of the lowland, solonchaks also emerged as a result of limans and salt lakes detached from the Caspian Sea.

The soils are serozems (gray-brown) and meadow, including solonchaks and solonetz soils. Vegetation is characterized by sagebrush and saltworts. There is an age-old history of agricultural development in KAL, and water for irrigation is now mainly taken from Mingechar Storage Reservoir. Agriculture has been through a series of stages: from 1931 to 1941, irrigation was adapted to the natural water regime, and then from 1945 to 1965, the transformation of the water regime by the Mingechar hydropower complex along with a combination of irrigation and power development and, partly, with water supply occurred. The main irrigation canals are Shirvan and Verkhnekarakabakh. Concurrent with irrigation activities, large-scale work is under way to level and leach saline lands: the purpose of this work is not only to desalinize the soils but also to freshen the top strata of ground water. Additionally, measures are being taken to prevent secondary salinization. KAL is the main base for growing cash crops, largely cotton (80% of the Azerbaijan harvest), but grain crops are also cultivated here. Fruit gardens and vineyards are there. And oil fields also mark the land.

Some areas of KAL are named after the steppes: Shirvan steppe (on the left bank of the Kura River), and Karabakh, Mugan, Mil and Salyan Steppes (on the right bank of the Kura River). The Circum-Kura inclined plain stretching along the Kura at the foot of the Minor Caucasus is the continuation of KAL.

Kura Barbel Sturgeon (*Acipenser nudiventris derjavini*) – genus of sturgeon family, the body is elongated and of spindle-like shape. The snout is short but pointed. The number of bony plates is variable: 11–16 in the spine, 51–74 in the belly, and 11–17 in the sides. KBS dwells largely in the Middle and South Caspian, and hardly ever in the north of the sea. It is anadromous. For spawning, it runs to the Kura, Ural, and Sefid Rud, and hardly ever to the Volga. Runs into the Kura throughout the year; however, its migration is not uniform: maximum of the run falls in March and April (50–60%), while in autumn there is a run in October and November (15–20%). In the Ural River, the run is pronounced in spring (April and May). KBS is a large fish. The length of its body reaches 220 cm. Its spawning grounds in the Kura and Araks are in the same segments where the spawning grounds of other sturgeons are. Spawning occurs from the end of April to May at water temperature of

15–25°C. In the Ural River, KBS produces spawn in various areas of the lower and middle river flow. The baby fish swim into the sea in summer. KBS is a valuable fish, but not available in abundance. It is propagated artificially in the Kura.

Kura Military Flotilla – established in the summer of 1920, its objective was to assist the Red Army units in their fight against the counterrevolutionary gangs and to protect the river segment of the Soviet-Iranian border. The flotilla had battleships “Salyanets” and “Bakinets”; the armed steamship “Beketov”; and reconnaissance boats “Serenga,” “Bar,” and “Filatov.” It also had transport means.

Kura River Delta – in the east of the Kura-Araks Lowland, Azerbaijan. The delta area is 204 km², stretching in a southeastern direction in the form of a peninsula jutting out about 15 km into the sea. The delta width does not exceed 7 km. KRD is a lobate-type delta of an enclosed sea with a steep offshore at a stage of transition to a single arm protrusion delta. In the Kura delta, there is a contracted area of promising oil-bearing structures Ateshgakh, Yavan-Tava, Mugan-Deniz.

Kura Spit – situated 20 km south of Neftchala City, it limits Kyzylagach Bay of the Caspian Sea, Azerbaijan. The spit, subject to the Caspian Sea level, is now and then built up or scoured. The spit seashore features human settlements Prorva, Saratovka, Zharskin, Kurkosa, and others as well as numerous fisheries.

Kura (South Caspian) Stellate Sturgeon (*Acipenser stellatus stellatus natio cyrensis*) – morphologically, almost identical to North Caspian, but biologically (period of maturity and growth rate) is somewhat different. When at sea, it keeps largely to the middle and southern part of the Caspian, yet some fish do penetrate as far as the north, to the boundary of the Volga pre-mouth area. It swims to the Kura for spawning. It runs up the Kura as far as Mingechaur, up the Araks as far as Karadonly Village, and up the Samur River and the rivers of the Iranian seashore. It enters the Kura all year long; however, in spring (April–June) and autumn (September–November) the bulk of the fish migrate. The length of the body 98–192 cm. Yields of KS in the Kura comprise fish aged 7–25 years. The spawning grounds of KS are the same areas of the Kura and Araks that are used by other sturgeon species. Spawning lasts from May to August on pebble ground at water temperature from 15 to 26°C. Young fish mainly run into the sea in June and July. KS’s food is similar to that of North Caspian stellate sturgeon. KS is an important food fish of Azerbaijan, although its population is significantly lower compared with the North Caspian form. KS stock is maintained by artificial propagation.

Kura Stone – the southernmost island in the Baku Archipelago, Azerbaijan, it is situated 11 km from the eastern shore of Kyzylagach Bay. Discovered by F.I. Soimonov and named Kura (after the Kura River). The island is a cone-shaped upland linked with dryland by a subsea bulkhead (depth under 10 m). On the island are low mud hills. The shores are hemmed by a narrow sandbank, and its depth is below 5 m.

Kura (Persian) Sturgeon (*Acipenser gileldenstaedti persicus*) – genus of fish in the sturgeon family, the body is slender, dyed ash-gray in its spinal section and sometimes has a bluish tincture. It has a long and narrow head and a narrow forehead and snout. KS is larger than the Russian sturgeon. Its length equals 88–229 cm, and its mass is 22.4–76.2 kg. An anadromous fish, it spawns in the Kura, Sefid Rud, and other rivers of Iranian seashore and occasionally in the Volga and Ural. Feeds on clam worms, seabed crustaceans, and fish (atherina, kilka, herring, and gobies). KS is of commercial significance. Its artificial propagation has been established at fish-rearing stations in Kura lower reaches. The spawning population of sturgeon is being increased at present through natural and artificial reproduction, the latter being prevalent. The fish population reproduced at the fish farms averages 27.6% of the total. Depending on the size of commercial fish stock and intensity of fishing, the yields of KS in the Caspian basin are subject to considerable fluctuations. The highest yields were usually noted in the years of sturgeon fishing in the rivers. Sea fishing also brought high yields, especially when pubescent fish were included in the catches. All kinds of nets (seines, hook-and-line gear, etc.) were used for KS fishing. Sea fishing on the Caspian Sea was terminated in 1962 as biologically irrational. Nowadays, KS is fished during its spawning migration in the rivers with cast nets.

Kurenie – smoking of salted fish.

Kurenaya, Kurenka – salted fish, mainly roach, Chalcaburnus, and herring, smoked with a sawdust smoke.

Kurkhai Fishing – spring-time fishing of stellate sturgeon in a sea bay not far from the Atyrau seashore of Kazakhstan.

Kuryk – settlement and a bight of the same name in Alexanderbai Bay in the Mangistau Region in Kazakhstan. Plans have been drawn to build a new port and base for the Republican Navy and border guards. The settlement will specialize in transit cargoes.

Kutan – a farmstead or nomad's camp of shepherds in mountain rangelands (Turk.). The following meanings are noted: “range,” “large area of arable land” (Kumyk, Nogai, Avar, Azerb.). In the North Caucasus and in the Circum-Caspian area it means “fenced area in a steppe for cattle” or “sheep-cot.”

Kutum (*Rutilus frisii kutum*) – valuable semi-anadromous fish of the Middle and South Caspian that is used for food. Common from the Terek River southward up to Anzali Bay and on to the Atrak River. Previously, its main spawning ground was the Kumbashinka River in Azerbaijan. Since then it has lost its importance, and the main site of its propagation became Samur Lake and Minor Kazylagach Bay. At present, K. spawns in all rivers of Daghestan. The length of its body is from 28 to 58 cm, and its mass is from 600 to 3,400 g, averaging 1,750 g. K. reaches sexual maturity at the age of 4, sometimes 3. Spawns in the slow-flowing water of pre-mouth areas of the rivers on diverse substrates: just-flooded vegetation, bulrush

thickets, on underground stems of coastal plants, as well as on a rocky ground. *K.* larvae are hung up on plants with the aid of special organs in quiet overgrown segments of a river, having drifted in the flow. *K.* meat exhibits excellent gustatory qualities and is especially valued in Iran where it is consumed sun-dried and is used for cooking various national dishes. In this connection, artificial breeding of the species at fish-rearing stations is of great importance.

Kyzyl-Agach – settlement on the shore of Minor Kyzylagach Bay, Lenkoran Region, Azerbaijan. In the fifteenth to seventeenth centuries, Kyzylagach Bay and harbor used to be a major trading center between Russia, Persia, and India. Via K-A. lay the caravan route to Gilan and Mazandaran, where merchants from Europe and Russian traders exported silk and other goods. Almost all vessels that sailed from the North of the Caspian to the south called at Kyzylagach Bay. Prior to the twentieth century, a deep-water harbor, impenetrable to the winds of all directions and secure against the impact of sea waves and convenient for the calling and berthing of sea ships, was near K-A. K-A. was the main and transit point of the entire region. The harbor had 5 large timber jetties (2 for log shipping, 2 for passenger-and-freight, and 1 for bulk-oil). Astrakhan timber carriers as well as numerous freight-and-passenger and mail ships called here. In 1921, a railway line was extended as far as the jetty. When Port-Ilyich was built, the K-A. harbor lost its former significance for maritime traffic; gradually, the harbor water area went dry and now is occupied by fields of agricultural crops.

Kyzylagach Bay (formerly Kirov Bay (until 1991)) – bay mapped for the first time in 1720 and named after the river Kyzylagachchai (“alder-tree river”) (Azerb.) flowing into it. In 1935, it was renamed Kirov Bay after the Soviet Party functionary S.M. Kirov (1886–1934). In 1991, the former name was restored, but in the form of “Kyzyl-Agach”. It is located in the southwestern part of the Caspian Sea (Lenkoran District, Azerbaijan). It is separated from the sea by Kura Spit on the east. The bay shores are flat and dissected. Over its age-old history, KB underwent dramatic and abrupt changes. Until recently, the bay territory stretched as far as Salyan City and westward beyond it. The existing Mugan, Mil, Salyan, and Shirvan Steppes used to be the bottom of the once large and deep KB, which was separated from the sea and acquired its present-day contours only at the end of the eighteenth century. During that period and earlier, the Kura with its arms the Akusha, Armyanka, and South Kura, used to flow into KB, filling it with it sediments and building up the delta dryland. By the 1830s, the water inflow in the bay had declined perceptibly and as early as in the 1860s the greater part of the river runoff had shifted to the eastern arm of the Kura. This resulted in the build-up of Kura, Krestovaya, Lebyazhya, and Kabanya Spits as well as of the chain of islands separating the Greater and Minor KB. In 1930, the input of Kura water into the bay virtually ceased altogether. In 1940, the bay water area shrank abruptly which led to its northern part going dry completely. The bay boundaries are: Salyan Steppe in the north, Mugan Steppe in the west, and Sara Peninsula on the continent. To the east, the bay is hemmed by Kura Spit, and on the south is the Caspian Sea. Roughly

speaking, the bay has a rounded shape. In view of the abrupt rise of the Caspian Sea level after 1978, KB water area regained its former size and even increased due to KB coastal areas being flooded. KB is the only and best spawning ground and fish nature reserve on the entire Azerbaijani shore of the Caspian Sea. Sixteen different fish species from the Caspian and Kura come here in large schools for spawning. The sturgeon, stellate sturgeon, salmon, and roach assemble here. The territory of KB is part of Kyzylagach Reserve. Due to the variations of the Caspian Sea level and of the runoff of the Mugan arms of Araks River and of the Akusha arms of Kura River, KB was multiply subjected to dramatic changes. These are manifest in the changing shoreline of the bay and shrinkage of its area. The bay water area fluctuates from 1200 to 850 km². All spits (Krestovaya, Lebyazhaya, Kabanya) except Kura Spit have disappeared; the latter has asserted itself as a robust barrier, increasingly separating the Greater Bay from the high sea. When the Caspian level dropped, the bays Gorky Kultuk, Bezymyanny, Kabanii and Labyazhii merged with the mainland. The islands Greater Kulagin Solonetz, Yoshan (Burunki), Karabattak (Baklanii), and Sara, having merged with the northern shore near Karakush, have become the elongated Sara Peninsula, which divided the bay into two parts: Greater and Minor.

Kyzylagach Reserve – situated in the extreme southeast of Azerbaijan in the vicinity of Kyzylagach Bay of the Caspian Sea. When it was established in 1929, its area was 180 thou ha; today, it equals 88,360 ha. Until 1992, the reserve was named after S.M. Kirov.

The characteristic feature of the reserve is its exceptional dynamism associated with the variability of the Caspian level, the changing channels of the Kura and Araks rivers, and human activity. The reserve has a clearly defined specialization: protection of wintering waterfowl (geese, brent geese, ducks, swans, bald coots, flamingoes, and others). It is Europe's largest wintering site for waterfowl. The water bodies are also the largest spawning grounds of numerous valuable fish (sturgeons, etc.) in the southeast of the Caspian Sea. The reserve has two fish farms. Of the 74 fish species that inhabit the Caspian Sea, 54 are encountered in the Greater and Minor Kyzylagach Bays. The reserve is also a habitat for 310 species of birds. These arrive here from the nesting areas in Western Siberia, the South Urals, and Northwestern Kazakhstan. Rare birds, entered in the "Red-Data Book," also live in the reserve: roseate pelican, Dalmatian pelican, spoonbill, mute swan, Bewick's swan, red-breasted goose, white-headed duck, white-tailed eagle, flamingo, francolin, osprey, little bustard, Indian gullinule, and great bustard. Roseate pelican in the reserve is a wintering and migratory species; its population in KB is around 150–200 specimens.

Kyzyl-Su – bight, see *Turkmenbashi*

L

Lagan – formerly Caspiisky (from 1944 to 1991), city in Kalmykia, center of Caspian District in the Republic of Kalmykia, 310 km southeast of Elista. Situated in the Circum-Caspian Lowland, 42 km from the Ulan-Khol railway station on the Astrakhan-Gudermes line. Population – 13,900 (2009). It has been a city since 1963. It emerged as a settlement of peasants who migrated from Central Russia to Lagan Island. The location for a long time was an island off the northwestern shore of the Caspian Sea. During the eighteenth to nineteenth centuries, this land area had different names: Lagansky Island, Lagansky Mound, Lagansky Kultuk, Lagansky Stan (camping ground), Laganskie Fisheries, etc. The name of “Lagan” was a derivative of the Mong. *lag* – “silt”, “silty”, the first settlers were attracted here by the fisheries’ wealth in 1765. Before the beginning of the twentieth century, Lagan Settlement was an island. Nowadays, the location is 9 km away from the Caspian Sea and maintains contact with the sea via the man-made Lagan Shoalbank Canal. There is a local machine-building plant, meat-canning factory, and fish-processing facility (est. in 1937) – was some of the largest in the Volga-Caspian fisheries area; fishing fleet maintenance facilities; and a local oil and gas recovery authority.

“Lagan Shoalbank” – canal, see “*Lagan Shoalbank*” *Canal*

“Lagan Shoalbank” Canal – built in 1934, it was refurbished in 1954 and 1972, and again in 1985 to allow the passage of fishing boats with draughts of 2.6 m, considering the Caspian Sea level as of –28.7 m. The length of the canal is 41.6 km. At present, the canal’s width is 20–25 m and its depth, taking into account sea level rise, is 3.3 m. The canal reaches the Volga-Caspian Canal which is 146 km long.

Lahijan – city situated 30 km south of the Caspian Sea between Ramsar City and Rasht City, Gilan Province, Iran. Its population is 62 thou people (2005). Prior to the fourteenth century, L. was the only human settlement at Gilan. After the rise of Rasht City, the importance of L. begins to decline. It is famous for its numerous tea plantations and tea-packing factories.

Lakis (Lakis, Kazikumukhs) – indigenous population of Daghestan (140 thou in 2002). People of this nation in the RF total 156 thou (2002). The dwellers of Kazikumukh Village, when invaded by the Arabs, accepted Islam and began

to spread it so enthusiastically that they were given an honorable name of Kazikumukhs by the Arabs (*kazi* – “one fighting for one’s faith”). Their language is Lak of the Daghestani branch, Iberian-Caucasian languages. Dialects are Kumukh, Vitskhin, Vikhlin, Shadnin, Arakul, Bartkhin, Ashtikul. They are Sunni Moslems.

Land-Locked or Semi Land-Locked Sea (legal) – means a bay, basin, or sea surrounded by two or more states and connected with some other sea or ocean via a narrow passage, or consisting entirely or mainly of territorial seas and sole economic zones of two or more coastal states.

Langarud, Langerud – river flowing into the Caspian Sea some 20 km southeast of Sefid Rud Cape, Gilan Province, Iran. The last 6–7 km before flowing into the sea, the river flows parallel to the seashore, separated from it only by a narrow spit. The width of the river mouth is 20–30 m; the depth to the longshore bar is around 1 m. In the vicinity of the mouth, the Langerud takes in its tributary, the Shalmanrud River. The river banks are precipitous. Near the mouth the river is called Chamkhala.

Langarud, Langerud – city located on the banks of the Langarud River, 9 km from the Caspian Sea, Gilan province, Iran. Its population is 68 thou people (2005). The people engage in horticulture and vegetable-growing. The Circum-Caspian Highway runs through the city.

Layer-Wise – method of fish salting: guts are removed from the fish and then salted in layers, one on top of the other.

Lebedia – ancient Russian name for the Circum-Caspian Lowland.

Legal, International-Legal Status of the Caspian Sea – with the establishment of Russia in the Caucasus, Trans-Caucasus and Central Asia, the status of the Caspian was defined by two Caspian states – Russia and Persia. The most important events in the history of I. L.S. were the Gulistan Peace Treaty of 1813 and the Turkmanchai Peace Treaty of 1828, which replaced the former. They confirmed free navigation of merchant ships and fixed the exclusive right of Russia to have the Caspian Navy. By the Turkmanchai Treaty, the border between the Russian Empire and Persia was marked by a line “along the right bank of the Odinabazar River to its upper reaches and from there as far as the top of the Djikoir Mountains so that all waters flowing from these mountains to the Caspian Sea will belong to Russia and all waters flowing towards Persia will belong to Persia. But as the border between two States goes over the top of the mountains it was stated that the slopes of these mountains towards the Caspian Sea should belong to Russia, while the opposite slopes belonged to Persia” (Art. 4). In addition, the dominating rights of Russia (and only Russia) over the Caspian Sea is confirmed by one more international treaty, the “Special Treaty Between Russia and Persia in Turkmenistan concluded on February 10, 1828” (in particular, its Art. 1 and 3).

A similar confirmation is the Convention on “Delineation to the East of the Caspian Sea” signed in Tehran on December 9, 1881.

The presently effective status is defined by the Treaties between the Russian Socialist Federative Republic and Persia of February 26, 1921 and the USSR-Iranian Treaty on Trade and Shipping of 1940. They stated the regimes of free shipping, free fishing (except the 10-mile fishing zones) and banned sailing of ships under flags of third countries. These provisions remain effective and binding for all Caspian countries.

After the breakup of the USSR and appearance of three new Caspian states – Kazakhstan, Azerbaijan, and Turkmenistan, the situation in this region has changed drastically. Addressing of the legal status of the Caspian Sea became pending because the effective status fails to regulate the issues of resource use and nature conservation between the new states.

Beginning in 1992, the deputy foreign ministers of the littoral states began conducting consultations and negotiations within the framework of the Ad Hoc Working Group on settlement of the Caspian legal status. The Caspian needs special legal status as the norms of the UN Convention on the Law of the Sea are not applicable to it. The Russian position is that “delineation of the seabed for resource use among the neighboring and opposite-lying states, keeping the water body in common use.” It proposed to organize a 15-mile coastal zone that would be in the national jurisdiction of the littoral states. The priority consideration should be given to the problems of the use of mineral deposits, bioresources (fishing), and nature conservation.

A significant advance in formation of the Caspian legal status became the “Agreement between the Russian Federation and the Republic of Kazakhstan on delineation of the Northern Caspian seabed for exercise of sovereign rights to resource use” signed in 1998 and the Protocol thereto of 13.05.2002, the Joint Declaration of the Russian Federation and the Azerbaijan Republic on Principles of Cooperation in the Caspian Sea signed in 2001, and the Agreement Between the Russian Federation and the Azerbaijan Republic on Delineation of the Neighboring Parts of the Caspian Seabed signed in 2002. In addition, in 2001 the Republic of Kazakhstan and the Azerbaijan Republic signed the Treaty on Delineation of the Caspian Sea Bottom. In 2003 (May 14) the Treaty between the Russian Federation, Azerbaijan Republic and Kazakhstan Republic about the Meeting Point of Delineation Lines of Neighboring Parts of the Caspian Sea Bottom was signed.

Lenkoran – city, center of Lenkoran District, Azerbaijan. Founded about 300 years ago. The name is derived from Lenkergukan, meaning “anchorage; moorage”, though according to another version, it came from lene – “water-logged area” and Koran – “outskirts, shore”. Situated on the left bank of the Lenkoranchai River at the mouth of the river into the Caspian. In the past, L. used to be the capital city of Talysh Khanate. It has a railway station. Population – 203 thou people (2008). It is the center of a subtropical area and contains a branch of the Azerbaijan Institute of Horticulture. They engage in viniculture and produce other subtropical crops. There is a food industry (canning factory, fish-processing plant, tea-packing factories), building materials

plant, and forest industry. There is also a furniture-making factory. There is a technical secondary school and a music school. Sulfur springs flow up here. There are historic and architectural monuments in the city, such as Lenkoran Fortress (eighteenth century) and the mosques Beyuk Bazar and Kichik Bazar. One of the fortress towers is equipped with the Lenkoran lighthouse, which is over 120 years old.

Lenkoran District – is situated on the southwestern (40 km long) seashore of the Caspian Sea in Azerbaijan. It borders on the south with Astara Dist., on the west with Lerik Dist., and on the north with Masallii Dist. The area is 1539 km², and the population is 203 thou (2008), of which 58 thou (30.5%) is urban and 132 thou (69.5%) is rural. This district of the Republic is most densely populated: 132 persons/km². There are two cities in the district: Lenkoran, the district center, and Port-Ilyich. It also has 80 villages. The district is essentially agricultural. Its main crops are vegetables, tea, and citrus. There are 27 industrial enterprises in the district: 2 vegetable-and-fruit canning factories, 6 tea-packing factories, 2 fish-processing plants, 3 textile mills, 3 motor transport companies, and 1 household electronics plant.

Lenkoran Lowland – situated in the south-east of the Azerbaijan Republic, between the Talysh Mountains and the Caspian Sea, strung along the shore for over 100 km. Its width varies from 5 to 6 km in the south to 25–30 km in the north, where it merges with the Kura-Araks Lowland.

LL gently slopes toward the sea aggradational plain, structured by Quaternary marine and alluvial deposits. Its climatic and natural conditions are determined by the mountain barrier of the Talysh Range which augments the fall of frontal precipitation and condenses the moisture brought in by winds from the Caspian Sea. There are four terraces (from 4 to 33 m) rising above the Caspian Sea level. These are structured by clays, loams, and (the most recent ones) sands with pebble-beds. The widest one is the second terrace, featuring water-logged woods and paddy fields. The eastern part is heavily water-logged and abounds in small lakes. Marshes and mortso are separated from the sea by a strip of dunes.

LL is the most humid area of the Caspian seashore, with annual precipitation reaching 1,225 mm. The number of rainy days is 115, and the maximum of precipitation occurs in autumn. At Astara, 300 mm of precipitation fell during a single day once (November 1927). The mean annual temperature is 14.7 °C. The summer is hot: mean temperature of July and August is around 26 °C. The winter is mild, with the mean temperature in January being 3.3 °C. The Caspian Sea in winter is also a source of heat as it contains large reserves of heat in its deep-water part. The winters are sometimes quite severe. In 1925, –15 °C was registered in Kirova (Kyzylgach) Bay, which froze completely, killing tens of thousands of birds.

The soils of the seashore are alluvial and oozy-boggy on the mortso shores as well as recent poorly-developed sandy soils of the sea-coast dunes. The higher terraces feature subtropical, podzolic, and podzolic-gley and heavily-podzolized forest soils grouped with subtropical yellow-podzolic soils.

In forests, still preserved as stand-alone areas, are chestnut-leaved oak, alder, and other tree species. The area produces subtropical crops (rice, tea, tobacco, etc.) and engages in sericulture.

Due to frequent rains and moist ground, they build homes in LL settlements on piles, with high roofs. In orchards, they cultivate ebony, lemons, and tung. Of the southern introduced species, the following plants have adapted to the local conditions successfully: cedar, fan palm, bamboo, pampas grass, feijoa, pecan nut, cork oak, gutta-percha tree, Canadian maple, Japanese cedar, etc.

Lenkoranchai, Lenkoran – river that originates in the Talysh Mountain Range, Azerbaijan. Recharged by rain.

Lenz Emiliy Khristianovich (1804–1865) – Russian physicist, oceanographer, from 1830 he was an extraordinary academician. From 1823 to 1826, he travelled round the earth on the sloop “Predpriyatie” (“Enterprise”) (commanded by O.E. Kotsebu) during which he made some significant observations in oceanology. He studied vertical distribution of water temperature and salinity in the oceans and a diurnal march of air temperature in different latitudes. L. invented (in association with E. Parrot) a sea bathometer, an instrument for water sampling at a desired depth for laboratory research, and a depth gauge. He proposed the barometric leveling method. L. was the first to address the issue of century-long changes of the Caspian Sea level based on observations of the sea dynamics. L. was sent to find out the causes for and nature of Caspian level fluctuations. He mounted two benchmarks in Baku to compare the sea levels observed in different years. At L.’s request, the Ministry of Finance ordered Baku Customs in 1836 to arrange regular observations of the Caspian Sea level in Baku Bay and, to quote the order, “to obtain the earliest proof of the anticipated lowering of the Caspian Sea surface or, as some believe, of its periodic rise . . .”. Instrumental observations of this nature on the Caspian Sea commenced on February 1, 1837.

Letnii Aleksandr Aleksandrovich (1848–1883) – an outstanding Russian scholar and engineer. He was born in Petersburg. Graduated from Petersburg Institute of Technology in 1871 with a degree as a process engineer 1st rank. He worked at the same institute until 1879. Then he moved to Baku, where he continued working until he died. In 1874, L. explored Syzran asphalt field and came to the conclusion that the local asphalt can replace the asphalt that Russia was importing from Europe, paying gold for the importation. Then he designed and built at Syzran the first Russian asphalt plant. In 1875, he published his fundamental work “Pyrogenic Distillation of Bituminous Fossils.” In 1877, the Department of Trade and Manufacture issued a privilege (patent) to L. for the method of hydrocarbons recovery from oil and fuel oil, which was called pyrolysis. L. was the first to isolate hydrogens of aromatic series from oil: benzol, toluol, kilol, isopropyl toluene, naphthalene, anthracene, and phenathrene. Not only was L. the first to discover the pyrolysis process, he introduced it on an industrial scale. L. designed and built Ragozin plant in Yaroslavl where they recovered aromatic hydrocarbons from oil raw materials. In 1878, L. published a paper entitled, “The Impact of High Temperature on Oil” making a

higher degradation of oil possible. In 1879, he designed Rops plant in Petersburg that became the first and only mineral oils plant in St. Petersburg.

During the Baku period of his brief but brilliant life, L. managed the construction of two plants at Kirmaku Village in the vicinity of Baku. One of these plants was the first to start production of ceresine on a commercial scale in Russia. This made it possible to initiate the manufacture of Russian-made candles. The raw materials for these was ozokerite from Cheleken Island (at that time) on the eastern shore of the Caspian Sea. Concurrent with this project, L. dealt with the problem of exporting Baku oil to Batumi.

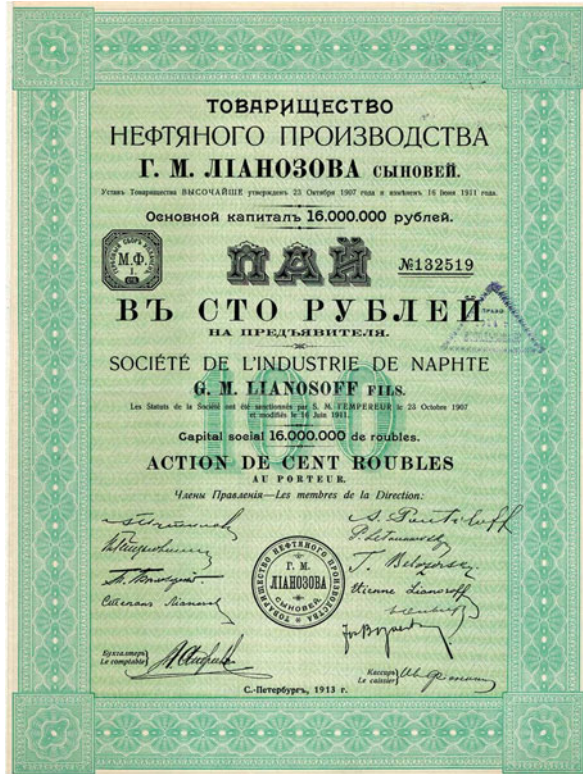
Lezgins (selfname – *Lezgiyar*) – a people in the south of Daghestan (337 thou people in 2002), and Azerbaijan (178 thou people in 1999). In the RF they comprise 412 thou people (2002). Their language is Lezgin, with two dialects: Kurin and Akhtyn, which are of the Lezgin group of the Daghestani branch of Iberian-Caucasian languages. They are mainly Sunni Moslems, though some Shiites are encountered.

Lianozov Stepan Georgievich (1872–1951) – court counselor, hereditary honorable citizen, major entrepreneur, son of the well-known oil industrialist G.M. Lianozov. In 1907, he founded the oil-production partnership “G.M.Lianozov’s Sons” in Petersburg. L.S.G. was on the board of 22 other companies, in particular of the “Eastern Company for Warehouses, Insurance, and Goods Transportation with Issue of Loans”, “Moscow-Caucasus Oil Industrial-Trading Partnership”, and he became one of the promoters of the Russian General Oil Corporation “Oil,” which was established in 1912 to combat the oil trusts of the Nobel brothers and Rothschild. From 1919, L.S.G. was the head of the Northwestern Government created under N.N. Yudenich in Estonia. In 1920, he was one of the organizers of the anti-Soviet Russian Trade-and-Industry and Financial Union (“Torgprom”), an émigré organization of Russian business circles in Paris.

“G.M. Lianozov’s Sons” – oil production partnership “G.M. Lianozov’s Sons” was one of the largest oil industry firms in Russia. It was established in 1907, following the transformation of industries that belonged to the oil industrialist G.M. Lianozov by his heirs (S.G. and D.G. Lianozovs and others). The firm’s board was in Petersburg. Originally, the Partnership owned the oil fields with 18 boreholes near Baku, the petrol, kerosene, oil and hypsolite plants in Baku, and the warehouses in Baku and Batumi. In 1912–1914, the partnership bought part or all of the shares and property of the following enterprises: “A.S. Melikov and Co.,” Apsheron Oil Industry Company, “Aramazd” Oil industry and Trading Company, the oil fields of K.L. Kvarnstrem, Ya.A. Mansvetov, Krasilnikov Brothers, Tiflis Bibi-Eybat Partnership, and the “Khalafi” Partnership. In 1913, the partnership, in association with the Caspian Partnership and Russian Partnership “Neft” (“Oil”), established the subsidiary Oil Industry and Exploration Joint-Stock Company to which it submitted 51 application for oil-bearing areas near Grozny. From 1912, in association with the Russian Partnership “Neft,” and from 1914, with the “Partnership of Nobel Brothers,” it acquired and developed new oil-bearing areas near the village of

Voznesenskaya in Tersk Region, in Shirvan Steppe near Grozny, and in Dossor Stow on the Emba River (Ural Region). However, the Partnership was focused on oil recovery from the leased lands, and the lease payments accounted for up to 36% of company income (1916). In 1920, the Partnership enterprises was nationalized.

G.M. Lianozov's Sons
(<http://www.bull-bear.ru/catalog/unusual/map/185.jpg>)



Light Oil – crude oil with a high percentage of light hydrocarbon fractions. Density in compliance with the Russian standards is 0.65–0.87 g/cm³.

Lighthouse – (1) at a navigation obstruction sight, it is a tower-type structure with a light source (a light-optical system) that is turned on at night. L.'s purpose is to identify the shore, enable ships to determine their positions on the sea, and warn of a local navigational hazard; (2) any sign, pole, or bar with a lock of bast or bunch of reed at the end to mark the location of fishermen's gear or nets in the sea; a sign on the ice during winter fishing at sea. On the Caspian are Makhachkala L. and Chechen L.

Liman – shallow-water bay.

Liman – a small town in Astrakhan Region, it is the center of Liman District, 110 km southwest of Astrakhan. Situated on the Volga lower reaches, in one of the

flood plain water bodies close to the river's right arm, Bakhtemir, on the Caspian coast, 25 km southeast of Zenzeli Railway Station. It was founded in 1910 by the Kalmyk D. Dolbanov and named Dolban after the man. From 1943, it has been called L., and from 1965, it has been a town. L. has a number of industries, including a brickfield, a butter factory, a bread-making plant, etc.

Lionozov Stepan Martynovich (unknown–unknown) – prominent Russian entrepreneur. Came from a poor Armenian family, but graduated from the Tiflis Commercial School. He was a participant in the 1857–1859 Caucasus War. In 1862, he moved to Astrakhan, where at first he managed the affairs of the merchant Mirzoev, then focused his activity on salt-works, supplying, on easy terms, salt to Terek and Kuban Cossacks. In 1872, L. was awarded the Golden Medal “For the Good Cause”. In 1888, together with other entrepreneurs, L. rented Persian fisheries, having thus become a pioneer of a major Russian industrial enterprise in Persia. The company was mainly engaged in fishing “red salmon”, zander, cat-fish, and sazan (carp) in the Caspian Sea. The fish was delivered from the fisheries to Astrakhan by sailing schooners. The turnover of fish goods from 2 fishing areas alone (Anzali and Sefid Rud) was as large as 300 thousand poods (1 pood = 16 kg). Thanks to proper management of the fishing business on the fisheries, L. was able to change for the better the living conditions of fishermen and was awarded the Persian “Lion and Sun” order for humane treatment of Persian hands. In 1891, the title of a commercial counselor was conferred on him, and L. was granted a hereditary honorable citizenship. L. was famous for being a major philanthropist in Astrakhan. His huge house on Kanava (“Ditch”) (currently, 1st May Quay) nowadays houses the Volga-Caspian College of Fishing Industry, and it used to be a shelter for the sick and poor.

Live-Bait Fishing Boat – fishing sailboat and sometimes transport vessel once common in the Caspian Sea. Named after the technique of fishing: live-bait fishing (i.e. bait cut into pieces or live bait – zhivod'). LBFB were of 3 types: sea-going (length 21–29 m, width around 6.5 m, tonnage under 250 t), catcher's (length 6.9 m, width 3–3.5 m), and zhivod' boats. LBFB had a raised bow, sheltered deck, and hinged rudder. The hull's middle compartment was a keepnet with slits for running water in which live-bait was kept.

Locia (Pilot) (“sailing directions”) (Dutch *steer a ship*) – (1) section of ship navigation science, dealing with making provisions for safe navigation of aquatic and air (air navigation) vessels; (2) manual containing detailed description of aquatic or air (air navigation) routes (special L.). Marine general-purpose L. deals with conditions of navigation in the seas and presents information on aids to navigation currently used at sea. General-purpose river L. deals with navigation conditions on domestic water ways (rivers, lakes, and storage reservoirs). Special L. (marine and river) describes conditions of navigation in a particular sea, river, lake, etc., and contains data on hydrological and weather conditions of navigation, descriptions of the ship channels (on rivers), underwater obstacles, approaches to ports and anchorages (sea roads), typical shores (banks), aids to navigation, etc. Special L. serve as manuals for the navigator and are usually attached to the sailing direction charts.

Locked Sea – name given to the Caspian Sea by the Arabs in ancient time.

Lokbatan – town on the Caspian shore, Azerbaijan, 3 km from Puta Railway Station. Its population is 30.6 thousand people (2009). There is oil production there (the oil field is at the foot of a mud volcano).

Long Walls – sometimes referred to as “Long wall lines.” These fortifications, built by Sassanide tzars at the best (bottleneck) locations of the Circum-Caspian route they controlled, formed a defense against incursions of the steppe people. On the territory of the Azerbaijan Republic, such LW are believed to be Besh-Barmak earthen mounds and Gilgilchai or Shirvan LW. On the territory of the Daghestan Republic, the Great Caucasian Wall or Mountain Wall, and south of Derbent is the Rubas Wall.

Lopatin – peninsula in the lower reaches of the Terek, Daghestan. During the period of Mangyshlak regression, it emerged as a beach-ridge that girdled Agrakhan Bay. During the period of neo-Caspian transgression, the peninsula performed shore-protection, acting as a natural dike, though that brought the problem of dike-induced drainage. The man-made slot in the body of L. peninsula compounded the situation further. Agrakhan Bay became shallowed and water-logged.

Los’ (“Elk”) – an island in the Baku Archipelago, situated 8.5 km to the southeast of Cape Pirsagat. Uplifted in its upper part and sloping down to the south, the island could be reminiscent of an elk back. The local name is Garasu. The island is low, its surface is uneven, and it is of oval shape. The island is 900 m long and 600 m wide. Its northern and eastern shores are precipitous. There are a large number of gas springs and small mud salses observed in the middle part of the island. Due to the large quantity of the disgorged volcanic mud following a 1923 eruption, the height of the island increased by 1.5–2 m.

Lotus (*Nelumbo nucifera*) – “water rose”, species of aquatic perennial herbaceous plants, ascidiform family. Two species, one of which is Hindu lotus. This is a relict plant, known from the Cretaceous period. The L. flower only lives 3 days. It opens out with sunrise and turns to follow the sun. The seed capsules and pollen of a deflorated L., according to the old-timers and physicians, is a unique and highly-effective raw material for medicines used to cure gastral diseases. L.’s huge flowers change the color of their petals from pale yellow to purple. There exist several hypotheses of how L. made its way to the Volga delta. One such hypothesis says that L. was brought in by the birds as they were migrating. L. seeds capable of germinating when placed in water bodies have been found in the stomachs of the birds.

According to another hypothesis, L. was introduced by Kalmyk nomads who believed that L. was a sacred plant. It was once called “the holy rose of Kalmyk Steppes” (the emblem of the Republic of Kalmykia features L.). The third version insists that L. is an aboriginal plant of the Volga delta that has been preserved for millions of years. In Europe, L. is only found in the Volga delta (Russia) and in Kyzylagach Bay (Azerbaijan). Astrakhan is referred to as the “capital city of the miraculous Lotus.” By tradition, the dwellers of Astrakhan assign this name to all most important things or phenomena (e.g. the ship-building giant is “Lotus” Plant).

Yellow L. is encountered in North America, and Indian L. is in South and East Asia and in South Europe. The greater part of L. population is in the Damchik area of Astrakhan nature reserve. The areas under L. are as large as 5 thou ha. The plant is entered in the Red Data Book of the USSR.

The name of L. is also given to a species of water-lilies growing in the water in Northeast Africa, the co-called Egyptian L.

Lotus
(<http://www.yage.ru/lotos/3.jpg>)



Lovets (“catcher”) – one who is fishing. Until now, old-time fishermen on the Volga and in the North Caspian call themselves catchers, while the younger generation call themselves fishermen. Until the 1930 s, the word “fisherman” was hardly ever used because in the Lower Volga the word had an additional meaning: fish trader and fish buyer. L. dealt with fishing only, not with fish sales.

Low-Lying Area, Low-Level Blowing Wind – wind blowing from the sea against the river current.

Low-Sulfur Oil – crude oil with a low content of sulfur.

Lowland (Plain) Daghestan – extreme southwestern extension of the Circum-Caspian Lowland stretching from the Kuma River in the north to the Caucasus mountain foothills in the south. LD occupies 46% of Daghestan’s area. The Circum-Caspian Lowland within Daghestan is an almost flat, slightly inclined plain, mainly of an alluvial-accumulation topography. Gradually sloping down to the Caspian shore, the substantial part of its area is below the world ocean level (down to –27 m). It was structured by sea and river alluvial deposits 1–2 to 50 m in thickness of Quaternary and partly Pliocene Age. LD is subdivided into Terek-Kuma, Terek-Sulak, and Coastal Lowlands.

Lower Samur (Derbent) Plain – situated to the south of Derbent pass in a relatively narrow strip between the Caspian shore and foot of the mountains, widening

and gradually merging with the Samur delta, Daghestan. The plain in its southeastern part is structured by Upper-Sarmatian limestones occurring horizontally, with a slight slope toward the Caspian Sea. In the southwestern part of the plain and around Khoshmenzil are small (3–4 m high) ouvals strung from the northwest to the southeast. Here, 3 terraces are traced: Hazarian at the height of around 100 m above the Caspian mean sea level as well as early and recent Khvalyn terraces at the height of 74 and 26 m, respectively. Within Derbent city and south of it, there are 3 ancient Caspian terraces whose surfaces gently slope seaward, yet their ledges are buried under the dunes. On the surface of the terraces is a group of small lakes where table salt is mined.

LUKOIL, Oil Company – Russia’s first vertically-integrated oil company, dealing with oil recovery, production, and marketing of oil products. In 1991, under a decree of the RF Government, an oil concern uniting 3 oil-and-gas producing companies: “Langepasneftegaz,” “Uraineftgaz,” and “Kogalymneftegaz” was established. The initial three letters of the names of these companies formed the name of the JSC “LUKOIL” Oil Company established in 1993 on the basis of the former concern. That same year, two major oil refineries “Permnefteorgsintez” and “Volgogradneftepererabotka” joined the company. In 1995, the company was enlarged with 9 other enterprises that included “Permneft,” “Astrakhan-neft,” “Nizhnevolzhskneft,” and “Kaliningradmorneftegaz”. L. owns 4 oil refineries in Russia (Nizhegorodsky, Volgogradsky, Permsky, and Ukhtinsky) and 2 abroad (Bulgarian “Neftekhim” and Romanian “Petrol”). L. is one of the world’s leaders among the oil companies in terms of oil reserves and ranks fourth by oil recovery volumes. L. has developed a uniform strategy of developing all its divisions that consists of making provisions for sustainable growth of production, efficiency, and enhanced management practices. The company places emphasis on technical upgrading of production. The development strategy is in large measure oriented towards cooperation with foreign partners and active foreign economic relations. L. is interested in broadening the scope of foreign operations in the field of oil processing and oil products marketing (downstream), attracting foreign investments, as well as in access to the foreign resource-and-raw materials base. L. cooperates actively with foreign companies, such as “Ajip” (Italy), “Atlantic Richfield Co” (ARCO) (USA), “Shell” (USA), and others. It is developing oilfields in Egypt, Algeria, and Tunisia; its plans include participation in the development of the Western Kurna field (Iraq). Concurrent with this, L. is developing a marketing network in Turkey. The Caspian Region is a priority for L. It is the most active in Azerbaijan, Kazakhstan, the Baltic States, and Belorussia. L. wastes no time developing the fields in the Caspian Sea. In 1994–2002, the company was a member of international consortiums intended to develop the fields Azeri, Chirag, and Guneshli (10%); Karabakh (32.5%); and Shah-Deniz (10%). At the end of 1999, L. commenced drilling in the Russian part of the Caspian Shelf. It is planned that oil production will start in March 2010 at Yuriy Korchagin oil field, which is located 180 km from Astrakhan and 240 km from Makhachkala. This oil field reserve is estimated as of 570 mln barrels.

M

Main Bank – name for the Volga-Caspian Canal by inhabitants of Astrakhan.

Main Shirvan Drain – built to receive highly saline drainage waters of the Shirvan and Mil-Karabakh Irrigation systems and divert these outside irrigated tracts to the Caspian Sea; also used to make provision for draining a flooded area of 20 thou ha in the area of “Shirvan Korasu,” Azerbaijan Republic. Length of MSD is 215 km, and maximum capacity at outlet is 37 m³/s. MSD influences an area of 297 thou ha, out of which 155 thou ha is in the Shirvan Steppe and 142 thou ha is in Mil-Karabakh Steppe. There are nearly 80 structures built on the drain (aqueducts, inverted siphons, bridges).

Majlis (Arab.) – name of a representative agency of power in some states (e.g. in Iran, Azerbaijan, and others).

Makarkin – the delta front island in Damchik area of Astrakhan reserve. Emerged in 1936–1937. Its surface is structured by sand and shells of brackish-water cardium mollusks. The soil cover consists of plant residues; in the northern, more elevated part, it is accessible to Volga deposits, where thin loamy alluvial soils took shape. Most of the island is overgrown with cane.

Makhachkala – a city founded in 1857, it is the capital of the Daghestan Republic, situated on a narrow strip of Coastal Lowland at the foot of Tarkitau Mountain, near the foothills of the Greater Caucasus. Its population is 466 thou people (2009). The earliest settlements within what are now the city limits have been known since the Bronze Age. During the seventh to tenth centuries, it was the Hazar City of Semender, which was the capital of the Hazar Kaganate, until approximately 723. Later, during the medieval centuries, Kумыk City of Tarki emerged on the slope of Tarkitau Mt.

For all the ethnic differences between the Kумыks, Avars, Lezgins, and other people of Daghestan, its territory and population were already regarded by neighboring states as an undoubted unity, its vivid manifestation being an invariable union and mutual assistance in the struggle against Persian (Iranian) and Turkish conquerors. The earliest mention of Daghestan (i.e. the “mountain country”) is encountered in the writings of Ibn-Haukal, the Arab geographer of the ninth to

tenth centuries. Some areas of Daghestan were known as Albania, Avaria, Tarkov, shamkhalate at different times. The latter was famous for its political and trade relations with the Russian state since 1619, when the first ambassador arrived in Moscow from Tarkov. On August 12, 1772, Tarkov shamkhal Adil-Girei solemnly received at his quarters Peter I, who had begun his Persian campaign in June. The camp of Russian troops headed by Peter I was located on Anji-Arka hill, where Makhachkala lighthouse is at present. The history of M. begins in 1844 when a fortress was built on Anji-Arka hill. The Daghestanis called it Anji Fortress or Anji-Kala (“flour fortress” – as it served as the main point where foodstuffs for troops were delivered from the Volga). In 1857, the fortress was renamed Petrovsk-Port (until 1921), where the camp of Russian troops was located during Peter I’s Persian campaign in 1722 (at that time, the city population was 2,000 dwellers).

By 1870, the construction of a man-made harbor and port was completed. The building in 1896 of the Rostov-Baku railway that ran through Petrovsk-Port was conducive to a considerable increase of the port goods turnover and to the growth of local industry. In a matter of a few years, there emerged an oil refinery, a barrel factory, a large cotton mill (“Krasnaya Manufaktura”), a tobacco-processing plant, a printing-works, and railway workshops. The first Russia population census of 1897 indicates that the population of the city was 9.8 thou people. Judging by the description of the “Kaspïi” newspaper, Petrovsk-Port early in the twentieth century was a city with streets difficult to traverse, houses and barracks made of sun-dried brick, one small bathhouse, a dozen water-pipes of general use, two schools, and a 12-bed city hospital. During the Civil War, from the summer of 1918 to early 1920, the city was occupied by German and Turkish troops. Later, the city was in the hands of British troops and White Guard units. On March 30, 1920, the Red Army freed Petrovsk-Port. On November 13, 1920, at the 1st Extraordinary Congress of Daghestan Peoples, the autonomy of Daghestan was promulgated. On May 14, 1921, by decision of the Daghestan Revolutionary Committee, M. became the capital of Daghestan ASSR that had come into being on January 20 of the same year. In memory of the killed Daghestani revolutionary Magomed-Ali (Makhach) Dakhadaev (1882–1918), the city was renamed again in 1922. During 1921–1991, M. became the capital city of Daghestan ASSR. From 1991, M has been the capital of the Daghestan Republic. The city was heavily damaged during the severe earthquake of May 14, 1970. At that time the city had a population of 186 thou people.

The climate is transitional from marine to continental. The winter is mild, with a mean temperature in January of -1°C . The summer is very warm and dry, with rather frequent breezes and a mean temperature in July of $+24^{\circ}\text{C}$. Precipitation is around 400 mm per annum.

M. is a major industrial center that evolved on the basis of machine-building, chemical, light, and food-processing industry. In 1933–1937, a tanker basin was built. This is a strategic transportation junction (Makhachkala Sea Port) and a transshipment point on the Caspian Sea with a system of servicing facilities (ship-repair works, fish-canning factory, refrigerator, oil terminal, etc.). The railway station is on the line Rostov-on-Don–Baku. There is a regional airport. The following industries

are well developed: machine-building and metal treatment, chemical, light, food-processing (including fish-processing, canning, wine-making) industry, fabrication of building materials (glass fiber, limestone brick, ferroconcrete structures). M. is an important cultural and scientific center of the North Caucasus. Daghestan State University is here. There is a RAS research center here, comprising the Circum-Caspian Institute of Biological Resources, etc. Institutes of history, language and literature, polytechnic, agricultural, teacher-training, medical; 5 theaters, among them Avarian and Kumyk theaters of music and drama, Russian Drama Theater (established in 1925); the Republican museum of regional history and Graphic Arts Museum are also here. M. is a balneological and maritime climatic resort. The main natural curative factors, in addition to climate, are mineral springs and sulfide silty muds of salt lakes (Makhachkala, Greater and Minor Turali lakes). Sea sand beaches are here also. Not far from M. is Talgi health resort with hydrogen sulfide springs.

Makhachkala Commercial Seaport – Russia’s southern outpost on the Caspian Sea and one of Daghestan’s major industrial enterprises. The port operates all year round without icebreaker assistance and is connected via the railway lines with the entire territory of Russia. The site of the future commercial seaport was determined by Peter I during his Persian campaign in 1722. In 1841, a major fortification (port) was laid down through which supplies for the Caucasus troops from the Volga were arranged, using a cheap and convenient waterway. In 1852, Petrovsky lighthouse was built, and at that time there were already 2 sea roads at a distance of 2 km from the shore: an official one for ships with merchant goods and a military for ships with military cargo. In 1859, the Ministry of Railways announced a competition for the best design of a Caspian Seaport. The design prepared by the military engineer Volkengagen was recognized as the best one. Pursuant to the design, there were to be set up 2 manmade stone malls. MCSP was officially opened in Petrovsk-Port on November 19, 1870. In connection with the renaming of Petrovsk-Port into Makhachkala City, the port from January 25, 1929, began to be called Makhachkala Port.

A port is a navigable harbor that receives general cargoes and containers. The dry-cargo harbor includes railway and motor vehicle ferry complexes with a capacity of 1.5 million tons of cargo per annum. The port is a tanker basin with a capacity of 7.9 million tons per annum, capable of handling up to 5 tankers at a time. A ship-repair yard and a technical maintenance base operate here. Shore consolidation work and work to enlarge the territory and water area of the dry-cargo harbor have been completed. The construction of a grain terminal is about to end: the terminal will make it possible to handle up to 800 thou t of grain each year.

The port has a tanker basin 8.9 m deep with a 2.3 km-long canal, capable of receiving tankers of up to 12 thou t tonnage and it has a dry-cargo harbor. An oil depot situated near the port has tanks for 50 thou m³ and is capable of handling up to 100 tanks at a time. Due to the rising Caspian water level and severe storms, the port structures began to be destroyed quickly in the 1990s. The port is to be refurbished.

In 1993, a state frontier crossing point “Makhachkala – sea port” was opened.

Makhachkala lighthouse – established in 1866, it was built on Aji-Arka Hill in Makhachkala with a height of 84.4 m. M.L. is an octagonal stone tower with a lantern device on top. It was built to replace Petrovsky lighthouse.

Makhachkala Southeast – strong southeasterly winds during the cold season of the year in Makhachkala and Derbent, Daghestan.

Makhmudabad (Mahmood Abad) – city on the right bank of the Aleshrud River 11 km east-northeast of Izdeh Village, Mazandaran Province, Iran. The city used to be an important trade point on the Iranian shore, but after Nowshahr Port was built, its significance waned. The city also has a power plant, customs office, post-office, telegraph, and rice-hulling plant. The Circum-Caspian highway runs through the city in the southern direction toward Amol City and on to Tehran. This 180 km-long highway is the shortest way from the Caspian shore to the Iranian capital.

Malaya Plita (“Minor Plate”) – island, situated 4 km east of Great Plate Island, Azerbaijan Republic. It is a group of three small islands merged together. MP is part of the Apsheron Archipelago.

Maly Kyzylagach Bay – situated in the southwestern part of the Caspian Sea (Lenkoran District, Azerbaijan). On the southeast, it is limited by Sara Peninsula, on the north, by the area of the dried Khurshudchala (Salyan Steppe), on the west by Mugan Steppe (the lower reaches of the Talysh Mountains), and on the south by the Caspian Sea (Lenkoran roads), separated from it by a dike. The greatest length of M.K.B. is 16.7 km, and its width is 6.5 km. The shoreline is around 40 km, and the area of bay water surface is 140 km², with depths of 0.5–1 m. Due to the variations of the Caspian Sea level, the water area of M.K.B. shrinks or increases substantially. A natural link between the Greater Kyzylagach Bay and the Caspian Sea used to exist. During the 1930s, the input of Kura River waters via the Akusha River to the Kyzylagach bays ceased altogether, whereas Maly Bay, following the drop of the Caspian level, was separated from both the Greater Bay and the sea. At present, M.K.B. receives an insignificant input of fresh water from the Kumbashinka and Vilyazhchai Rivers and is connected with the sea via three canals: fish-pass, escape canal, and emergency canal, which were built as a result of work on M.K.B. in 1955 to restore its importance for fisheries.

Maly Zhemchuzhny Island – situated in the northern part of the Caspian Sea. A narrow strip of shell rock around 1 km long and under 500 m wide, it was formed 80 km from the sea margin of the Volga delta where there used to be a subsea shoalbank following the drop of the Caspian Sea level in 1930–1940. The island harbors a unique breeding colony of sea-gulls. The island is the largest in the North Caspian and is the nesting place of the great black-headed gull. This gull species, as well as the Caspian tern nesting here, are entered in the Red Data Book. Herring gulls, terns, and other species of birds nest here in large numbers. Under the Decree of the RF Government of 14.01.2002, M.Zh. is declared a natural monument of federal significance. Accordingly, the island area is granted the status of a specially guarded natural territory of federal importance.

Man-Made Island – situated at the exit from the main navigable arm of Bakhtemir of the Volga delta. The island was built in 1929. A lighthouse was erected to facilitate entry of ships from the Caspian Sea into the Volga. According to one legend, the island was built by Peter I at the place where a bark had been shipwrecked.

Manas – maritime climatic health resort, 50 km south-east of Makhachkala, 20 km from Izberbash City, and 9 km from Manas Railway Station, Daghestan. Situated on the Caspian Seashore. Mean temperatures: January, -1°C ; July, $+24^{\circ}\text{C}$. Precipitation is around 400 mm per annum. Mineral springs (iodide-bromine brines) were discovered at M. A properly equipped beach is available.

Manasozen – small river in piedmont Daghestan. Originates as two tributaries: the Khalagork, Kulimeer and Paraulozen in the Chonkatau Mountain Range; it flows into the Caspian Sea. The length of the river is 92 km, and its catchment area is 1,480 km². The catchment area of the upper reaches is in Limestone Daghestan, while the lower reaches is in a Coastal Lowland. Most of the precipitation falls during the warm season of the year in the mountainous part (500 mm per annum), while the lower reaches and in the basins receive 300–350 mm. Primary replenishment of the river is through rain.

Manat Azerbaijani – banknote, national currency of the Azerbaijan Republic. First Manat was issued between 1919 and 1923. The currency was called the Manat in Azeri and the Ruble in Russian. Second Manat (1992–2006) was issued for circulation in 1992 (1 Manat = 100 Gepiks). It replaced the Soviet Ruble at a rate of 10 Rubles to 1 Manat. The following banknotes were issued for this currency – 1, 5, 10, 250 Manat (since 1992), 50, 100, 500, 1,000 Manat (1993), 10,000 Manat (1994), 50,000 Manat (1996). Banknotes from 1 to 250 Manat featured a monument of medieval architecture (Baku's Maiden's Tower, twelfth century). A 500-Manat banknote showed the world-famous poet Nizami Ganjevi (1141–1209). A 1,000-Manat banknote featured a portrait of the President of the independent Azerbaijan Republic of 1918–1920, Mammad Amin Rasulzade. A 10,000-Manat banknote was called "shirvans" – because the obverse featured the image of the palace of Shirvanshahs. A 50,000-Manat banknote featured the mausoleum of Momine-Hatun and a portal with two towers. On 1 January 2006 a New Manat was introduced at a value of 5,000 old Manat. Banknotes in circulation are 1, 5, 10, 20, 50, and 100 Manat. Coins are 1, 3, 5, 10, 20 and 50 Gepiks. The notes look quite similar to Euro.

Manat Turkmenian – banknote, national currency of Turkmenistan. It was issued on November 1, 1993 replacing the Soviet Ruble at a rate 1 Manat = 500 Rubles. Notes were introduced in denominations of 1, 5, 10, 20, 50, 100 and 500 Manat. Banknotes featured: 1 Manat – building of the Academy of Sciences and ladies' knick-knackery as well as Il-Arslan Mausoleum; 5 Manat – building of philharmony and Parthian rhyton as well as Abu-Said Mehen Mausoleum (eleventh century) in Miana Village; 10 Manat – Government House and Tekesh Mausoleum (twelfth–thirteenth centuries) at Kunya-Urgench; 20 Manat – National library and Astan-Baba Mausoleum (eleventh–twelfth century); 50 Manat – Great Patriotic War memorial and Anau Mosque (1455–1456); 100 Manat – Presidential Palace and

Sultan Sanjar Musoleum (twelfth century) at Merve; 500 Manat – building of Molla Nepes Theater and Sufi dynasty (Tyrabek-Hanym) Mausoleum (fourteenth century) at Kunya-Urgench. These were followed by notes for 1,000 Manat (1995), and 5,000 and 10,000 Manat (1996). In 2005 a new series of notes was introduced in denominations of 50, 100, 500, 1,000, 5,000 and 10,000 Manat. All notes bear a portrait of former President Saparmurat Niyazov. In 1993 coins were introduced in denominations of 1, 5, 10, 20, 50 Tenge (1 Manat = 100 Tenge). After inflation new coins of 500 and 1,000 Manat were introduced in 1999. Since 1 January 2009 redenomination of the Manat was held at the rate of 5,000 to 1 due to inflation. New banknotes of 1, 5, 10, 20, 50, 100, 500 Manat features prominent historical figures of Turkmen history and architecture monuments in Turkmenistan. Coins are issued with the following denominations – 1, 2, 5, 10, 20 и 50 Tenge.

Mangistau Region – formerly Mangyshlak Region (until 1990), Kazakhstan Republic. Having come into being in 1973, it borders on the north and northeast with Atyrau Region; on the east with Aktyubinsk Region, Kazakhstan and the Uzbekistan Republic; and on the south with Turkmenistan (Balkan Velayat). Its area is 165.6 km², and its population is 416 (2009) thou people (urban population – 90%). It has 4 administrative districts, 3 cities, and 14 towns. Its center is Aktau (former Shevchenko). M.R. is situated within the Circum-Caspian Lowland and the western part of Ustyurt Plateau. On the west it is washed by the Caspian Sea. The climate is sharp and continental. The mean temperature of January is –3°C, of July is +26°C. Precipitation is around 150 mm per annum. There is no permanent river network. The soils are mainly brown, with sagebrush and salsola desert and areas of shrub vegetation. In the southeast of the region, the Ustyurt Reserve is organized to conserve rare animals, such as Ustyurt moufflon, caracal, and, possibly, single specimens of cheetah. The territory abounds in reserves of oil, gas, phosphorous, coal, manganese, various salts, and shell rock.

M.R. is Kazakhstan's oldest region of oil production. Nearly $\frac{3}{4}$ of oil recovered during the entire history of oil industry in the Republic falls on this territory. Around 70 oilfields have been discovered here, of which 27 are being developed. The largest of these are Uzen, Zhetybai (discovered in 1961), and Kalamkas-Karazhanbas. The combined oil reserves of these amount to 504.5 million tons. High hopes are pinned on the development of the Severnye Buzachi (Northern Buzachi) Field. Geological reserves of oil here are estimated at roughly 1.5 billion barrels. Zhagin Field of natural gas is also here. The delivery of oil and gas is arranged via the oil pipeline Uzen (Atyrau)–Samara and the gas pipeline Uzen–Bainau. The main industries are related to the recovery and processing of oil and gas.

Ships ply the waters of the Caspian Sea here. Aktau has the country's only non-freezing commercial seaport. Mixed railway-marine freight traffic is arranged through this port to Russia, Transcaucasia, and Iran. Besides Aktau port there are two low-activity ports – Bautino and Eraliev.

A nuclear power plant once operated at Aktau for a long time. The plant also functioned as an industrial installation for sea water desalination. At present, the

plant is being decommissioned. The major industrial centers are: Aktau, New Uzen, Fort-Shevchenko, Zhetybai, and Zhanaozen.

There is 6.8 million hectares of agricultural lands in the region. These lands are predominantly pastures. Astrakhan sheep-breeding, camel-rearing, and horse-raising are developed. Fishing and fish processing are at an advanced stage of development on the Caspian shores.

Mangyshlak – the largest peninsula on the northeastern Caspian seashore, Kazakhstan. Ancient name was Seiakh-Kuh. “Mangyshlak” is believed to mean “Menks’ winter camping ground” (Turk *menk* – name of one of Nogai tribes, *gyshlak* – “winter camping ground”). Another interpretation is this: *man* – “sheep” and *gyshlak* (“sheep wintering site, sheep camping ground for the winter”). The third interpretation: from misspelled *min kishlak* – a thousand villages, kishlaks. Makhmud Kashgari (eleventh century) suggested his own etymology: from *man kygilag* – “location (wintering ground) of man people.” M. is often referred to as the “peninsula of a thousand treasures.” On the north, M. is abutted by Buzachi Peninsula. The peninsula is a ledge of Mangyshlak Plateau, washed out and dissected by deep ravines in various directions. The shores are precipitous, in places vertical. It juts out into the sea by approximately 250 km. The surface in the south-western part is a plain with occasional depressions whose bottoms are sometimes below the ocean level (e.g. Karagie –132 m, Kuandy –57 m). In the southeast is the Mangyshlak Plateau, delimited by the Karysh-Zharyk Depression (–30 m) and filled with sands. To the north of M. stretch 3 mountain ranges: Mangistau, North, and South Aktau, separated by narrow valleys. On the south, the plateau is delimited by the Kenderli-Kayasan Plateau. The heights of M.’s mountainous part are under 555 m, and on the plateau is under 278 m. M. is structured by limestones, sandstones, and clay shales. M. exhibits harsh nature. The climate is sharp continental, dry. Precipitation is around 160 mm per annum. There are no rivers or fresh water springs. The soils are of a semi-desert type, the surface is partly covered with sands and solonchaks. The vegetation is desert, with good rangelands: grazing is common. Living conditions are extreme to humans. M. has deposits of manganese, phosphorous, oil, and gas. At the end of the 1950–1960s, large fields of oil, gas, uranium, and other mineral resources were discovered.

Mangyshlak Bay – situated at the eastern shore of the Caspian Sea, between the western shore of Buzachi Peninsula and northern shore of Tyub-Karagan Peninsula. On the northwest it is delimited by the Tyulenii Islands. Its length is around 100 km, its width at the entrance is around 70 km, and its depth is 9–14 m. M.’s summit is called Kochak Bay; to the west of Kochak Bay is Sarytash Bay. M.’s eastern shore is low-lying and is hemmed by mud flats, while the southern shore is an uplifted plateau, dissected by ravines, balkas, creek and channels and has a steep precipitous seaward slope. Here, hills and mountains are almost directly adjacent to the shore. Vegetation is scarce. M. usually freezes in winter.

Mangyshlak Furrow – narrow recess, furrow, passing along the northern shore of Tyub-Karagan Peninsula. Its depth is about 13 m.

Mangyshlak Region – see *Mangistau Region*

Mangyshlak Shelf Edge – structural-morphological boundary between the northern and middle parts of the Caspian Sea. It looks like a natural dike, as it is a large gently sloping step in the seabed relief. The name of M. is collectively referred to as a number of islands and subsea bars that constitute a continuation of the Karatau Mountains. The shelf edge is a pronounced zone of a relative shoal stretching from the Tyub-Karagan Peninsula to Chechen Island.

Mantashev Aleksandr Ivanovich (1842–1911) – one of the representatives of the Mantashevs family, Russian capitalists of Armenian decent, an entrepreneur and merchant. He founded the oil processing company “A.I. Mantashev and Co” in Baku in 1899 and was a shareholder of the “Nobel Brothers Partnership.”

“**Mantashev A.I. and Co.**” – oil-industry and trading company and one of the largest joint-stock oil-industry firms in the Russian Empire. Established in 1899, following the transformation of the trading house, owned by A.I. Mantashev, an Armenian oil industrialist who came from the family of a Tiflis trader. At the time of establishment, the company had 147.7 dessiatins (1 dessiatina = 2.7 acres) of oil-bearing land, rented 25.6 dessiatins at Balakhans, Sabunchakh, Ramankh, Zabrat, and Bibi-Eybat (all in the vicinity of Baku). Additionally, the company owned a kerosene plant, a lube oil plant with a jetty of 100 sagesnes in length (1 sagine = 2.13 m), and a silo for pumping oil and fuel oil to the ships in Baku. The company had a mechanical workshop at Zabrat, warehouses and oil-filling stations at 34 settlements in Russia and at 15 points in Egypt, a case-making plant in Batum, and an oil pipeline of about 50 verst in length (1 versta = 1.067 km). The company sold oil and oil products in the Russian Empire and exported these (mainly kerosene) via Batum. The company operated its offices and agencies in Alexandria, Bombay, Cairo, Constantinople, London, Marseilles, Port-Said, Thessalonki, Smirna, and Shanghai. In 1912, Mantashev’s son Leon joined the Russian General Oil Corporation. Personal unions were established between the company and the Russian General Oil Corporation, between the Partnership “G.M. Lianozov’s Sons”, the Russian Partnership “Oil”, the Partnership “Mirzoev Brothers,” and “Moscow-Caucasus Oil-Industry and Trading Partnership”. During 1916, Mantashev’s company was gradually integrated into the Nobel Concern. In 1920, the company’s enterprises were nationalized.

Marco Polo (1254–1324) – the renowned European (Venetian) traveler before the epoch of the Great Geographical Discoveries. In 1271, M.P., who was 17 and with his father and uncle, traveled as a merchant and messenger of the Pope to Central Asia and China, where they arrived in 1275, where M.P. spent the next 17 years. During this time, at the service of the Mongolian Khubilai Khan, he visited different parts of China and neighboring areas. He was the first European who described China and many other countries of Central and Near Asia, becoming acquainted with their cities, manners and customs, and people. He returned to Venice in 1295.

From September 1298 to July 1299, he was in prison in Genoa where he was put after a sea battle. While in prison, he dictated to a fellow prisoner, *Rustichello da Pisa*, a detailed account of his travels. His notes, which were later made into the book, “The Travels of Marco Polo,” were soon translated into several European languages. This book was very important for increasing the knowledge of geographers about Asia. It also took its deserved place in the history of the Great Discoveries. The Russian translation called “The Book of Marco Polo” and was published in Moscow in 1956.

Marco Polo dressed in Tartar costume http://www.thirteen.org/marcopolo/wp-content/uploads/2008/10/marco_polo_-_costume_tartare.jpg



Mardakyany – town in Azerbaijan on the northeastern shore of Apsheron Peninsula, 34 km northeast of Baku, with which it is connected by an electric railway and a motor road. A maritime climatic health resort. An excellent sandy beach. Botanical gardens. Sanatorium, rest homes. A round castle tower from the thirteenth century, a tower from the fourteenth century, and remains of fortress walls and other monuments have survived here.

Mareograph – stationary instrument with a recorder, registering variations of the sea level at a given location.

Marine Fields of Natural Deposits – natural accumulations of mineral deposits (liquid, gaseous, and solid) in the subsoil and on the surface of the seas and oceans. The greatest emphasis is placed on M.F. of oil and gas. Several oil and gas bearing areas (OGBA) are distinguished – offshore and adjoining dryland segments with explored oil and gas reserves. OGBAs, having unique reserves of hydrocarbons, are found in the Persian Gulf, the Gulf of Mexico, the Gulf of Guinea, the Baltic, Caribbean and North Seas, the Alaska shelf, and the Caspian Sea. The Caspian Sea OGBAs include the marine fields and those of the adjoining dryland. The principal fields are discovered in the southern and northern parts of the Caspian Sea. The first M.F. wells (Neftyanye Kamni) were sunk in 1949. After 1972, on the Caspian Sea shelf were discovered the M.F. Bulla-sea and Livanov-Vostochnaya Shoalbank (1973), Garasu (1974), Barinova, Yuzhnaya-2 (1976), and 28th April (1979). The typical features of these fields are great depths of pay zone occurrence and unusually high formation pressure. During the 1990s, there were major oil-and-gas fields discovered in the North Caspian: East and West Kashagan in Kazakhstan, Khvalynskoe, and Central in Russia. In the South Caspian, Shah-Deniz was discovered in Azerbaijan.

Maritime Complex of the Astrakhan Region – located in four administration districts: Limansky, Kamyzyaksky, Volodarsky, and Ikryaninsky. Its area is 1,180 thou ha (24% of the region territory), and the population is 186.7 thou people (18.4% of the region's population). It possesses 20% of the industrial capacity and 36% of the agricultural production of the region. The population (66 thou people) lives in one city, Kamyzyak, and in 10 urban-type settlements. The leading industries here are food, fuel, and ship-building. The food industry dominates, comprising 65% of total output. There are 54 large agricultural farms. The fishery industry comprises 28 fishing enterprises, 6 sturgeon fish farms, 38 pond fish farms, and 6 fish processing enterprises. A considerable part of the M.c. is located in the zone affected by the water level variations in the Caspian, in the so-called “risk zone.” As a result, it suffers from deteriorating sanitary, economic, and social conditions, particularly in periods of the Caspian water level rise.

Maritime Hydrometeorological Center – established at the National Hydrometeorological Service of the Ministry of Environment and Natural Resources in Azerbaijan. The center has a large databank that is constantly updated based on observation results from the Caspian Sea. The center seeks to improve the exchange of data among all Caspian states and the Intergovernmental Oceanographic Commission and to elaborate and implement the regional and international programs on sea protection. In the future, its research will play a key role in the activities of the National Oceanographic Commission. At present, a number of meteorological stations are operating on the Caspian in Azerbaijan. They are located in Neft Dashlary, on the Chilov and Khara-Zirya islands, and in other places.

Maritime (Coastal) Lowland – a part of the plains of Daghestan, it stretches from the northwest to the southeast as a narrow strip for 160 km between the piedmonts and the Caspian Sea. From the Caspian Lowland, in general, and from the Tersko-Sulaksky Lowland, in particular, M.L. is separated by the piedmont ridges and their offspurs, such as Tarkitau Mountain, which comes close to the Caspian Sea near Makhachkala and the Andjiarka Mountain located in the city. Near Makhachkala City, Buinak Cape, and Derbent City, the lowland narrows to 2–3 km and the piedmonts come close to the Caspian Sea, while near Kaspiisky City and Mamedkala village and in the Samur mouth, it widens to 15–20 km. M.L. is a narrow flat land strip gradually rising from the Caspian Sea coast to the piedmonts. Its elevations vary from –27 m below the ocean level to +200 m. The ancient Caspian transgression left its marks in the form of four marine terraces that were interrupted by river valleys. Transversely M.L. was cut by valleys of several rivers (Cherkeozen, Manayuzen, Paraulozen, Achisu, Gamriozen, Ulluchai, Darvagchai, Rubaschai, Gyul-Gerychai, Samur, and others) and erosion hollows with a great number of irrigation canals. The basement of M.L. is composed of Paleogene-Neogene deposits overlain with ancient Caspian sediments that made up the maritime terraces. A narrow beach (about 100–400 m wide) runs along the Caspian coast. It is covered with sand and crushed shells forming not high (from 2 to 10 m) levees and dunes. The M.L. lakes include the Akkol, the Greater and Lesser Turali, and the Adji. They are not large and are classified as salt lakes. M.L. comprises isolated Makhachkala-Turalinsky, Terekmeisky, and Nizhne-Samursky plains.

Maritime Solonchak Lowland – belongs to the southern part of Southwestern Turkmenistan and is a part of the Caspian marine depositional plain. It extends along the Caspian coast beginning from the border with Kazakhstan in the north and ending in the Esenguli region in the south. It is characterized by variegated relief and soils. Its northern, Gekpatlaukh part represents a narrow solonchak strip going deep from the south into the Seyunagsak sandy area and then gradually widening in the southern direction. The solonchak is separated from the sea by the depositional levee about 1–1.5 km wide and to 10 m high, but on the latitude where the Gekpatlaukh bald mountain rises over the surrounding plain to 85 m, its width exceeds 10 km. The southern, Chikishlyar part of the solonchak lowland widens to 60 km. Here solonchaks do not cover the whole territory, but occur together with the less saline soils. The absolute elevations are less than –20 m and tend to rise eastward to –5 m. The coastal sandy levee changes significantly through its run. To the north of the Chikishlyar settlement, it is broken into three levees with a total width to 2–2.5 km and near Esenguli settlement it turns into a narrow terrain of hilly sand 3–4 m high. The monotony of the solonchak lowland is broken by narrow beach levees (1–2 m) and flat-top residual mountains (1–3 m) formed as a result of sea scouring and deflation processes and also cones of bald mountains forming a range where Akpatlaukh is 40 m high. In the south, the terrains are found with sandy ridges 10–15 m high representing the remnants of the more ancient terraced surface.

Marshy Thicket(s) – areas in the offshore zone overgrown with bulrush and entangled with tall and barbed branches of blackberry through which passage is difficult.

Masazyr – salt lake in the central part of Apsheron Peninsula, 10 km north–west of Baky City near the Masazyr Settlement. Area around 8 km², feeding from two salt sources. Sulfide silt mud is used for balneological purposes.

Mature Beluga – beluga whose length exceeds the commercial standard of 265 cm.

Mazandaran (Mazanderan) – historic province (ostan) on the Caspian shore in the north of Iran; part of the Circum-Caspian provinces. Referred to by Firdousi (tenth century) and presumed to be of pre-Moslem origin. In 1999, the province was divided into Mazandaran and Golestan. Its area is 23,756 km², and its population is 3.1 million people (2008) (53% – urban, 47% – villagers population, 15 districts, 46 cities, 2,870 villages). One of the largest agricultural provinces in the coastal lowland between the Caspian Sea and the Elburz Mountains east of the Sefid Rud. On the west, it borders with Gilan Province, and on the east, with Golestan Province. On the northeast, it borders with Turkmenistan, and in the south, it wedges between Zanzan and Semnan Provinces and Tehran. M.'s center is Sari City. Major cities are Babol, Amol, Nowshahr, and Kamshahr, Babolsar. M. is a territory so different from the rest of Iran by its appearance, soil, and climate that one tends to regard it rather as the continuation of the Caucasus. M. features lush vegetation: fig, almond, pomegranate, lemon, and orange trees. To quote Strabon, “a grain falling out of the head is enough to produce a new crop, the trees there are beehives, and honey drops from their leaves.” The climate is subtropical, humid. The northern part of M. is densely populated; they grow tea-bush, rice, citrus culture, sugar cane, jute, tobacco, and cotton. In the south, mostly on mountain slopes, are forests featuring valuable tree species: argan tree, beech, oak, box, maple, hornbeam, and others. M.'s subsoil contains mineral deposits of oil, coal, iron ore, silver, and gold. There is manufacturing (textile mills and ginneries), dairy, and rice-hulling industries. There are also fisheries on the Caspian shore.

Mazandaran Sea – the name for the Caspian Sea used in Iran, after the historic-and-geographical area Mazandaran on the southern seashore.

Mazandaranians – a people in Iran that inhabit a narrow strip of the southern Caspian shore and the adjoining mountain areas. M. population is over 12 million people. The Mazandaran Language belongs to the Iranian group of Indo-European language family. Affined to Persians, with whom they merge all the time. By religion, they are Shiite Moslems.

“Mazut” (“Fuel oil”) – trade and transport company set up by Rothschild's Firm in 1898. Used to own 13 tankers in the Caspian Sea, among which were “Bibi-Eybat,” “Aleksandr Kolesnikov,” and “Nikolai.” By 1912, it had grown to become a solid oil-exporting and trading association.

Measure Great Sturgeon – the great sturgeon of the largest size ever caught. It is measured from the nose to the anal fin.

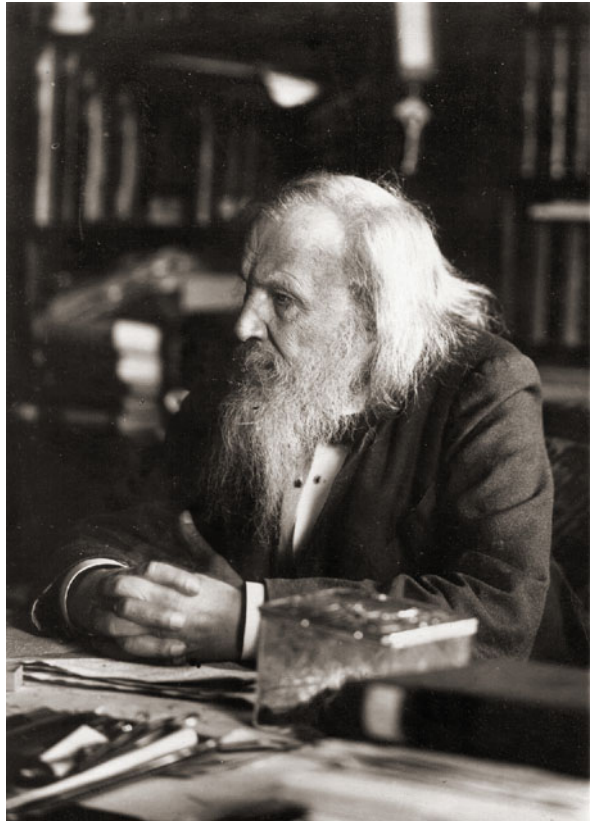
Median Line – dividing line between the territories of two states in the sea or ocean; a locus of points equidistant from the territorial boundaries of that state.

Mediterranean (Invasive) Species of the Caspian – penetrated into the Caspian Sea from the Novo-Euxinian or Ancient Black Sea Basin at Khvalyn time via the Kumo–Manych Strait. Consists of polychaete worms (Fabricia), of mollusks (2 species of cerastoderm and peralwort *Bowerbankia*), and of fish (needlefish, atherine, common goby). Early in the 1920s, these were joined by bivalved mollusk mytilaster (*Mytilaster limatus gmelin*). Between 1930 and 1934, Black Sea shrimps *Leander adspersus Rathk* and *L. squilla L.* penetrated in the Caspian Sea by chance, when the sea was being colonized by gray mullet. Some M.S. reached the Caspian Sea after the opening of Volga–Don Canal, in particular, barnacles, pearlweed *Conopeum*, crab *Ritropanopeus* and others. M.S. has had a substantial role in the food bases of the Caspian Sea fishes. At the end of the twentieth century, the jellyfish *mnemiopsis* was introduced.

Melon Growing – a branch of agriculture dealing with the cultivation of melon crops, such as melons, muskmelons, pumpkins, and others. It is most widely practiced in the Lower Volga areas and in the Astrakhan Region.

Mendeleev Dmitry Ivanovich (1834–1907) – outstanding chemist, he discovered the periodic law of chemical elements. He was born in Tobolsk. At 15, M. entered the Division of Natural Sciences, Physics, and Mathematics Department of the Main Teacher-Training Institute in Petersburg, from which he graduated with a gold medal in 1855. In 1856–1859, M. was an organic chemistry lecturer at Petersburg University. In 1861, he published a book titled “Organic Chemistry” for which he won the Demidov Prize. 1863 was a make-or-break year for M. He made his first trip to Baku and came to know the business of petroleum recovery. From that moment on, oil industry becomes one of the main areas of his research and practical activity. He pointed out the need for introducing a new process: continuous distillation of petroleum. He also proposed making use of petroleum residues for the production of lube oils in the article “What is to be done with Baku Oil?” In the article, he described a method of obtaining bakuoil (lamp oil). In the 1860s, M. wrote: “There are many reasons for claiming that oil production business may well develop in the Caucasus not only on a scale comparable to that of Pennsylvania, but may be even on a larger and more solid footing.” M. traveled to Baku several times (1878, 1880, 1886) to study the economics and state of oil fields mechanization. M. insisted that oil science and engineering must be upgraded all the time: “Being aware of the state of oil business in those locations of Russia that I visited, I consider it my duty to stress once again this source of the country’s future wealth. Wasting time as far as oil business is concerned is as good as losing forever.” M. was a member of the major foreign academies and holder of honorable scientific degrees conferred by foreign universities.

Mendeleev D.I.
(<http://dic.academic.ru/pictures/wiki/files/68/DIMendeleevCab.jpg>)



Mezhen (Droughty Period) – mean water level in a river that is established after the water has receded.

Miankaleh – peninsula in the northeast of the Iranian shore of the Caspian Sea. A narrow low-lying spit starting at meridian $53^{\circ}21'E$ and stretching eastward as far as the Gorgan Strait. It separates the Gorgan Bay from the Caspian Sea. M. beach from the seaside is 200–300 m wide and reaching 500 m in places. The northern shore is hemmed by a chain of sand dunes that are mostly 4–5 m and occasionally 15–20 m high. The dunes are usually fixed by shrubs. The middle part of M. is covered with thornbush thicket in which jackals and wild boars are common.

The peninsula used to be the habitat of a multitude of wolves, tigers, leopards, cheetahs, and other wildlife that were trophies when the shahs went hunting. Early in the twentieth century, the Persian authorities permitted Kurdish tribes to engage in animal husbandry on M. As a result of overgrazing, the territory degraded. The wildlife population shrank abruptly both as a result of hunting and of loss of the habitat. In 1970, M. became a protected area. In 1976, the Iranian Government allowed use of the land for cultivation, leaving only 68 thou ha as a wilderness area. There is still a threat to wilderness from the construction of a throughway across

the center of the peninsula as well as from the planned building of a railway and new pipelines. Plans have also been drawn to increase the volume of tanker shipping operations under the agreement between Iran and Kazakhstan (oil supply on exchange) and construction of new port at Amirabad that will become the center of activity under this Agreement.

There are a few fisheries on M. The ruins of Miankaleh fortress are also here, including 2 half-destroyed towers and the remains of the wall between them. Maly Ashur Fortress is on the eastern end of M. The fortress is a gray massive building with embrasures and a watch-tower in between.

Middle Caspian – area around 140 thou km² with a water volume of 26.7 thou km³ that occupies the areas between the North and South Caspian and has a mean depth of 213 m and a maximum depth of 788 m. It is characterized by a relatively simple morphology of the seabed. The central part of M.C. is occupied by a deep-water depression (Derbent Hollow) hemmed by the plunging into the sea stepped shelf zone and continental slope. The Middle Caspian depression is asymmetrical. The west shore is steeper, while the east is gently sloping. The western part of the depression is the deepest one, which is due to the special features of tectonics.

Middle Oil – crude oil with mean specific density of 0.871–0.910 g/cm³.

Midstream – one of the three main segments associated with energy resource transportation. In the oil-and-gas industry, this involves the use of pipeline systems and various kinds of transport (tankers, barges, railway and truck tankers, etc.) for oil and gas transportation.

Migratory Fish – fish that run from the sea to rivers or from rivers to the sea for spawning.

Mikhailov Shoalbank – situated 7.5 km to the south-southwest of the termination of the South Cheleken Spit near the Caspian eastern shore, Turkmenistan. It is named after Lieutenant Konstantin Ivanovich Mikhailov, a participant of a hydrographic expedition.

Mochagi – shallow-water, silty sea bays, overgrown with reed.

Molod' – young fish.

Moloko (milk) – protein of red (blue-backed) salmon.

Monitoring – process of observation of an object or phenomenon and is permanently effected on a regular basis over a fairly long period of time with predetermined aims and a detailed program. M. is customarily classified as baseline or background; global, regional, or local; and by impact as well as by methods and objects of monitoring (air, space, environmental).

The Frame Convention on protection of marine environment of the Caspian Sea foresees development and implementation of joint programs by the Caspian States. As of 2004, M. has been undertaken to determine the total reserves of sturgeons in the Volga-Caspian Basin.

“Monster of the Caspian,” “Caspian Monster” – the western nick for Russian wing-in-ground effect aircrafts, using the so-called “screen effect” – formation of a peculiar compressed-air foil under an aircraft flying just a few meters above the water surface. The “father of M.C.” at the end of the 1950s was R. Alekseev (1916–1980). The first tests of a 430-ton wing-in-ground effect craft with a wing span of 40 m and the cruising speed of 450 km/h were held in 1966 in Caspiisk city on the Caspian Sea. Two crafts were built: “Orlyonok,” which crashed in 1974, and “Lun” (“Harrier”), which was 600 t, had 8 engines, and could travel at 500 km/h. The “Lun” craft, renamed “Spasatel” (“Rescuer”), is currently being remodeled for the RF Ministry of Emergencies.

Monster of the Caspian
(http://davidszondy.com/future/Flight/KM_ekanroplan.gif)



Monteke Sands – situated in the north of the Caspian Sea between Astrakhan and the Ural River in the south of the Circum-Caspian Lowland.

Moorage Front, Moorage Line of a Port – a coastline of a port equipped with mooring facilities for berthing and moorage of ships.

Morskoi Biryuchok (“sea lone wolf cub”) – regional zoological sanctuary (Lagan District), Republic of Kalmykia. It was established in 1973, and its area is 50 thou ha. Situated in the northwestern part of the Caspian Sea coastal water area, it includes Morskoi Biryuchok Island, Kizlar Bay, and Dargin Shoalbank. Morskoi Biryuchok Island features cane-cattails “plavni” stretching as a wide strip that serve the habitat of mass nesting of waterfowl and semi-aquatic birds. It is one of Russia’s largest areas for congregation of migrating geese (red-breasted goose, lesser white-fronted goose, gray and tule geese). The main migration route of waterfowl and semi-aquatic birds of the Azov and Black Sea Basin passes through the sanctuary. In the sanctuary is an aggregation of molting and wintering birds. The steppe areas of the sanctuary are the locations where great bustard and little bustard migrate and some of them even winter.

Morskoi Ostrov (“sea island”) – situated at a distance of 20 km to the east of the northern part of Kulaly Island around Mangyshlak Bay, Kazakhstan. In the Atlas of A.E. Kolodkin (1826), the Kozei Podgorny Shoalbank is shown, and subsequently, this shoalbank became M.O. The length of M.O. is 3.7 km, it is not high, and its

western shore is a little lower than the eastern one and covered with thick vegetation. The northern part is low-lying, while a chain of sandy mounds stretches from the island's middle part as far as its southern end along the eastern shore.

Mortso, Morso – (1) shallow water bay, sometimes of huge size, merging with the Caspian in its northern part; (2) a small river dammed by dunes and sandy mounds and producing a flood in its lower reaches (in the south of Azerbaijan); (3) lagoon, lake on the Caspian seashore.

Moryana, Morina – (1) southeasterly wind blowing nonstop for several days, surging water from the Caspian Sea, thereby raising the water level on the seashore and in the Volga delta. One of the adverse effects of M. is fish kill, involving fish that are left in the cane thickets after the water has receded. In December of 1952, M. surged water across the northwestern Caspian seashore over a distance of 50–60 km, nearly as far as Kizlar; (2) sea water surged into river mouths; (3) storm blowing from the sea. Morina is the name frequently used by the dwellers of Astrakhan.

Moscow – capital city of the Russian Federation, center of Moscow Region, city of federal importance, constituent entity of the Russian Federation. The country's largest and one of world's major political, industrial, scientific, and cultural centers. One of world's largest megalopolises: territory (without the city of Zelenograd and other settlements subordinated to Moscow Mayor's Office) – 1081 km² (2009), population – 10.5 mln people (2009). Situated in the European part of Russia, at the Oka and Volga interfluves on the Moskva River (left tributary of the Oka River). Most of the municipal territory is at a mean height of 120 m above ocean level, as it is within the wide valley plains of the Moskva River and its tributaries: Yauza, Setun, and others. In M. central districts, the archaeological cultural layer thickness equals 4–6 m. More than 100 rivulets, among them the Neglinnaya (the Moskva River tributary) are channeled in the buried pipes. The climate is moderate to continental. The winter is temperately cold and protracted, with a mean temperature in January of –7.5°C. The summer is warm, with a mean temperature in July is +18.4°C. Precipitation is 600–800 mm per annum (maximum falling in July–August). Administratively, M. is divided into 10 districts (with the city of Zelenograd also enjoying the rights of an administrative district).

The earliest settlement of Slavic tribes (Vyatichi and Krivichi) emerged on M. territory and around it at the end of the first millennium. Moscow was for the first time mentioned in the Ipatiev's chronicle in 1147 as a possession of the Suzdal Prince, Yuri Dolgorukii. From the thirteenth century, M. was the center of principality, and from the fourteenth century, it was the center of the Great Moscow Principality.

In 1382, M. was burned down and looted by the troops of the Golden Horde. From the second half of the fifteenth century, it was the capital of the unified Russian state, and from 1708, it was the center of Moscow Province. After the capital of the Russian State moved to St. Petersburg (1712), M. retained the importance of a second capital city. In November of 1917, Soviet power was established in the city. From March 12, 1918, it was the capital of the RSFSR, and from 30.12.1922 to

25.12.1991, it was the capital of the USSR. From 1929, it has been the center of the Moscow Region. Since 25.12.1991, it has been the capital of the Russian Federation and the seat of the highest agencies of legislative, executive, and judicial power in the country.

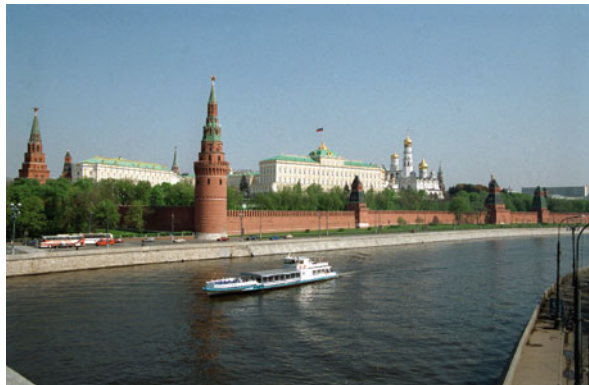
M. is a universally recognized center of arts, with over 140 theaters and 70 museums (Tretyakov Gallery, A.S. Pushkin Museum of Fine Arts, and others). M. is also the country's major center of radio and TV broadcasting.

M. is also the country's major scientific center: the Russian Academy of Sciences (RAS), Russian Academy of Agricultural Sciences (RASKhN) and others, including over 1,000 scientific-research institutes and design offices, over 80 institutions of higher education (including 13 universities (M.V. Lomonosov Moscow State University, Russian Peoples' Friendship University, N.E. Bauman Moscow State Technical University, Moscow Institute of Physics and Technology, and others), and 19 academies (agricultural, veterinary, oil-and-gas, management, and others). Some of the institutes deal with the study of the Caspian Sea: P.P. Shirshov Institute of Oceanology (RAS), Russian Federal Research Institute for Fishery and Oceanography, Water Problems Institute (RAS), Institute of Geography (RAS), and others.

M. is also Russia's major industrial center; the crucial trade and-financial center of the country; and the seat of the boards of numerous banks, major Russian firms, and agencies of foreign companies.

M. is Russia's major transportation junction, with 11 railway lines from 9 railway terminals channeling off from here in various directions. There are 3 major river ports in Moscow (Western, Northern, and Southern). M. is a port of 5 seas (the Caspian, Azov, Black, White, and Baltic). 13 highways link M. with Russian cities and countries near and far abroad. Four major airports also link Moscow. Russia's oldest (since 1935) and longest (299 km) underground subway system is also located in M (180 stations in 2009).

Moscow city
(http://www.russia.org.cn/pics/big/moscow_1.jpg)



Moscow-Caucasus Partnership for Oil Industry and Trade – founded in 1902 in Moscow to operate oil fields in Baku Province and oil storages in Yaroslavl as well as to trade in oil and oil products. The Gukasov Brothers were among the promoters of the Partnership. The firm's principal capital amounted to Rbls. 4.5 million. In

1905, over 25 million poods of oil was produced on the fields of the company. Due to stiff competition on Russia's oil market, Partnership's business began to go wrong gradually, and on the eve of the First World War, the firm's management changed. The company's principal capital was retained (Rbls. 4.5 million).

Mozer Sands – see *Terek Breaking Waves*

Mud Cone – geological structure imitating in miniature a volcano. Usually 1 m high and 10–20 m in diameter, with a crater of up to 0.5 m in diameter.

Mud Volcano – geological structure that discharges onto the earth's surface permanently or in a recurrent manner, masses of mud and gases, frequently with water and oil. MV occur largely in oil-bearing and volcanic areas. They are encountered in the Volga-Ural interfluvies. There are 30 volcanoes on the eastern shore of the Caspian Sea. MVs are confined to the shore of the Buzachi Peninsula and to stows Kaidak, Mertvyi Kultuk, and Prorva. In Azerbaijan and the adjoining part of the Caspian Sea, MVs commonly occur at 16,000 km² area. Maximum concentration of MVs are in the Shemakhino-Kobystan Region (108 volcanoes) and Apsheron Region (48 volcanoes). There are 25 MVs in the Baku Archipelago. These are in the form of sea-scoured islands (Bulla, Oblivnoi, Los', Duvannyi and others) or underwater banks. MVs are arranged in chains on tectonic lines or their inter-sections. They are characterized by natural activity.

Mud volcano
(<http://z.about.com/d/geology/1/0/C/0/1/mudvolcano500.jpg>)



Mugan – in the middle ages, this was the name of the area occupied by Mugan, Mil, and Shirvan Steppes in the southeast of present-day Azerbaijan.

Mugan Steppe – plain area south the Kura River in the area downstream of the point of confluence with the Araks River, part of Kura-Araks Lowland in the south-eastern part of Azerbaijan. In the south, it merges gradually with the Lenkoran Lowland and in the southwest it continues into Iran. Before it was conquered by the Mongols, M.S. used to be one of the flourishing areas of Transcaucasia with a dense network of irrigation canals. Prior to conquest by Mongols, M.S. fell into decay, and what used to be its rich cities turned into small settlements. M.S. is an alluvial plain, most of which lies below ocean level. It has mild winters and hot, dry summers. Precipitation averages 200–250 mm. The soils are serozems (gray-brown), meadow, and sometimes saline. Vegetation is semi-desert: sagebrush, pea shrub, ephemeral plants. Agriculture is based on irrigation. There are a number of major irrigation canals. Cotton-growing and animal husbandry are practiced on large scale.

Mukhtarov Murtaza (1855–1920) – major Baku oil industrialist. Born in Amirjan Village of Baku Province. Began his career as an apprentice at a locksmith shop, then worked as a foreman and drilling operator. He attracted attention as being energetic, enterprising, and having an organizing talent. He became a drilling contractor and advanced to become one of the leading entrepreneurs of Baku. Mukhtarov built a number of mechanical works in the Baku industrial area and succeeded in technical retooling of drilling operations. He was a shareholder of the Moscow-Volga Oil Partnership and administrator for the affairs of “Baku Company of Russian Oil.” M. was famous for being a generous philanthropist. He was curator of Baku non-classical secondary school, Temirkhan-Shura women’s upper secondary school, honorable member of Petersburg Moslem Charity, and founder of 40 scholarships for higher and secondary specialized educational establishments. He was an admirer of West-European culture and struggled against superstitions and prejudices among the highlanders. For this, he issued the “Tarakki” newspaper in Baku. He built many schools and mosques. In 1911–1912, the Polish engineer and architect I.K. Ploshko built a house for him in Baku, mimicking, in large measure, French gothic-style palaces. During the Soviet period, the building housed a Palace for wedding ceremonies.

Multi-Island or Multi-Arm Delta – produced by multiple division of the channel. The Volga delta is an example of this.

Muravyov (Karsky) Nikolai Nikolaevich (1794–1866) – Captain of the General Staff, brother of the Decembrist A. Muravyov, Colonel of the General Staff, founder of the secret society “Salvation Union.” He began military service at age 17 and participated in the 1812 Patriotic War. Under the leadership of M., to establish naval bases, including those on the Caspian shore, by order of General A.P. Ermolov, expeditions to the Caspian Sea were organized in 1819 and 1820. In 1819, M. explored the eastern Caspian shore, in particular, Krasnovodsk Bay, Neftyanı Island, and Dervish Island, and made reconnaissance of the Gorgan River, then M., together with the interpreter Petrovich (A. Muratov) and his batman, traveled across Karakums to Khiva on 4 camels and 2 horses, and he was the first person ever to describe the route from the Caspian Sea to Khiva. As a result, M.

made certain that the most suitable site for building a fortress was the shore of Krasnovodsk Bay. In 1820, M. was again sent to the eastern shore to make surveys of Krasnovodsk Spit, the northern shore of Balkhan Bay and its islands, as well as to study the northern part of the eastern shore of the Caspian, in particular Aleksandrbaï, Mangyshlak, and the Emba River mouth. M. laid the foundation of Voznesenskaya Fortress on Krasnovodsk Spit. In 1826–1828, he participated in the second Russian-Persian War and then in the Russian-Turkish Wars of 1828–1829. He gained the prefix “Karsky” to his family name for capturing Kars. In 1833, M. was appointed the chief of the Russian detachment sent to Bosphorus to assist the sultan struggling against the Egyptian Pasha. In 1835, M. was appointed commander of the 5th Infantry Corps. In 1836, he was discharged from military service but was subsequently reinstated in 1848. At the end of 1854, M. was appointed viscount of the Caucasus and Commander-in-Chief of the Detached Caucasus Corps. Holding the position of an infantry General (1853), from 1861, M. was the commander of the Samogit Grenadier Guards. M. is the author of a number of books: “Turkey and Egypt in 1832 and 1833,” “Russians in Bosphorus in 1833,” and “War Beyond the Caucasus in 1855.” The name of M. is perpetuated on maps of the Caspian Sea – a bay in Turkmenbashi (formerly Krasnovodsk) Bay, Turkmenistan, is named after him.



Muravyov (Karsky) N.N.
(<http://www.leo2m.nextmail.ru/pictures/murv.jpg>)

Murd-Abi, Mord-Ab (Pers. “dead water”) – the name applied to Anzali Bay of the Caspian Sea, Iran. The water in it is unusually calm.

Murgab(s) – brackish stagnant water lagoons, separated from the sea by shoals.

Museum of Daghestan Fishing Industry – situated in Makhachkala, Daghestan.

Museum of Fishing History – situated in Ikryanoe Village, Ikryaninsky District, Astrakhan Region, Russia.

Museum of Fishing History in the Lower Volga – situated in Oranzherei Village, Ikryaninsky District, Astrakhan Region, Russia.

Museum of the Red Banner Caspian Flotilla – opened in 1954 in Baku as a military-historical museum, its exposition deals with one of the oldest flotillas of the former Soviet Union. The museum shows how the flotilla came into being as well as the events of the eighteenth to nineteenth centuries, especially the participation of Caspian sailors in the revolution of 1905–1907 and in the Civil War, are illustrated very well. Among the exhibits is a list of ships that sailed from the Baltic Sea to the Volga River and the Caspian Sea to take part in the struggle against the interventionists; a model of the “Karl Liebknecht” destroyer which carried out heroic operations during the Civil War and materials about the 1920 Anzali operation are also here. Great emphasis is placed on the participation of the Caspian flotilla in the World War II of 1941–1945.

Myopathy – disease of sturgeons associated with dysbolism in muscular tissue, discovered in the 1980s. Manifests as “delamination of muscular tissue.” The muscles of affected sturgeons look limp and atonic, with muscle fibers are easily separated from one another. M. is caused by heavy chemical water pollution, especially with chlor-organic compounds, including pesticides and nitrogen fertilizers.

N

Nagaev Aleksey Ivanovich (1704–1781) – Russian hydrographer and cartographer, Admiral. Graduated from the Sea Academy in Petersburg in 1721 and worked there. In 1730–1734, made a description of part of the Caspian Sea, and in 1739 did the same for the Gulf of Finland. In 1745, based on materials of the 2nd Kamchatka expedition, drew the first map of the Bering Sea. He is also the author of the first Atlas and sailing directions of the Baltic Sea (1752). At the initiative of N., the first sea and weather observation station was setup in Russia in 1752. The station was intended to forecast possible floods induced by westerly winds. N. drew maps of Ladoga Lake, the Caspian Sea, Medvezhie Islands, the Oka and Moskva Rivers, and the Kolyma River mouth. The bay and port in the northern part of the Sea of Okhotsk (Magadan port) are named after him.

Nagiev Aga Musa – see **Oil Barons**

Nargen Island – situated at the entrance to Baku Bay, Azerbaijan. The Azerbaijani name is Beyuk-Zire. On the maps of the eighteenth century, it was known as Naissar. It stretched 3 km. The width of the western part is around 650 m, in the middle part it decreases to 170 m, and in the east it widens again to 740 m, becoming narrower closer to the end. Near the eastern tip stones are found. The middle part of the island is covered with herbaceous vegetation.

Narimanov – center of district of the same name, 48 km northwest of Astrakhan, Astrakhan Region. In 1984, the urban village Nizhnevolsk was transformed into a city named after the Soviet state and party figure N.N. Narimanov. Situated in the Circum-Caspian Lowland on the right bank of the Volga River, 40 km from railway station Trusovo on the Astrakhan-Gudermes line. The motor road from Astrakhan to Volgograd passes through. Its population is 11.1 thou (2009). “Lotos” Plant to manufacture block-modules for floating rig decks is here.

Naryn-Sands, Narynskie (Urdinsk) Sands – in the “Book to the Big Drawing” – description of Russia’s largest seventeenth century map (1627) – a reference to Naryn Sands is made: “And in those sands there grows grass and there are many

water wells.” N.S. are part of the Volga-Urals sands within the Circum-Caspian Lowland. The sands rest upon recent Khvalyn deposits. They are characterized by the wide sand ridges, called “naryns,” of northeastern and southwestern strike. Its widths 4–10 km (relative height under 10 m) with hummock-and-hollow meso-relief; low-ashiks (1–4 km) with shallow occurrence (1–3 m deep) of fresh ground water overgrown with vegetation. The length of such a ridge is 10–20 km, it is usually strung from the southeast to the northwest, towering above the inter-ridge hollows by 15–20 m. It is not uncommon for such a ridge to develop, which is why cuts and mounds are formed on its surface. Occasionally, the ridges feature natural thicket and artificial stalks of violet willow, hybrid maple, and silverberry, buckthorn, and dog-rose. Overgrown sands are covered with sand-hill wormwood, locoweed, etc.

National Center for Caspian Sea Research and Study – established in 1992 in Sari City, Mazandaran Province, Iran. The Center deals with such Caspian Sea problems as hydrometeorology, hydrodynamics, and construction in the coastal areas, as well as geology and geomorphology, land use, and coastal zone management. The Center is equipped with up-to-date instruments and has several ships. Additionally, its sphere of activity includes 3 observation stations currently being built to monitor the changing level of the Caspian Sea at Astara, Amirabad-Nek, and Bandar-Torkaman.

Natural Gas – a mix of light hydrocarbons (usually methane) in their natural state inside the earth. If the gas is mixed with oil, it is called accompanying gas.

Nature Conservation – development and implementation of measures towards rational nature management that include protection against excessive technogenic loads and adverse effects of human interference, active regulation of reproduction processes, and enhancement of landscapes’ natural potential as well as putting these into effect. N.C. in the Caspian Region suggests a comprehensive system of indispensable actions, among them assessment of environmental impact caused by diverse human activities.

Nautical Mile – the length of 1 min of the meridian arch. In Russia, Germany, France, and Sweden it is equal to 1,852 m; in Britain, USA, and Japan it is 1,853 m.

Naval Forces of the Azerbaijan Republic – one of the Azerbaijan Republic’s Armed Forces, along with ground and air forces. Azerbaijan NF include ships and military units of the former Caspian military flotilla handed over under an agreement reached with Russia. The ships and units comprise 2 frigates, 18 combatant crafts, 15 mine-sweepers, 4 landing ships, as well as 2 auxiliary vessels. The NF personnel strength is 2,200. NF are deployed in Baku.

Naval Forces of the Islamic Republic of Iran – represented by two independent commands: Command of Army Navy in the Caspian Sea area (4th Naval Area, Anzali Naval base) and Command of the Islamic Revolution Guards Corps in the

Caspian Sea area (Coastal Guard battalion at Nowshahr Port). An Army Naval Training Center is based at the ports of Nowshahr and Anzali as well as Rasht (not far from the coast). A school of Iranian frogmen is located on the Caspian Sea coast. Iran has 3 anti-submarine vessels, 2 patrol boats, fast boats, as well as several hovercrafts. In all, the Iranian Navy on the Caspian Sea has around 90 war and auxiliary ship units, largely small-sized.

Naval Forces of the Republic of Kazakhstan – Naval Forces began to be formed after the Presidential Decree “On Establishment of Naval Forces of the Republic of Kazakhstan as part of the Republic’s Armed Forces” (1993).

The purpose of NF is to provide for national security and ensure the observance of high sea legislation, suppression of breaches of law and sea crimes, organizing customs control and combating illegal traffic (drug traffic), bioresources conservation, carrying out search-and-rescue operations, making provisions for safe navigation and seafaring, implementing provisions of the international maritime convention, and environmental protection. The backbone of the national fleet is patrol boats made available by the USA and vessels built at the Urals ship-building works. In 1988, the first Kazakhstan naval ship, the smaller mine-sweeper “Berkut” (“golden eagle”) came off the Uralsk slipway. Several war ships were allocated by Russia from the Caspian flotilla. The Kazakhstan fleet will be deployed along the entire Kazakhstan shore of the Caspian Sea at the port of Atyrau, Bautino, Aktau, Eralievo. A naval college has been opened at Aktau. The establishment of the fleet is scheduled for completion by 2010–2015.

Naval Forces of the Republic of Turkmenistan – the backbone of national navy are fast vessels – boats of the type of “Grif” and “Kolkan” as well as the “Point Jackson” boat presented by the USA. The Naval Forces will be deployed in Turkmenbashi.

Naval Port – port intended for the deployment of naval ships and part of the naval base. NP has roads and harbors for ships berthing as well as jetties and godowns to make provisions for the fleet with fuel, ammunition supply, foodstuffs, and other types of supply. On the Caspian Sea, these are Anzali (Iran); Baku (Azerbaijan); Novokomarovka, Makhachkala (Russia); Kuryk (Kazakhstan); and Turkmenbashi (Turkmenistan).

Navigable River – river accessible for navigation (of river vessels only or of river and sea vessels) throughout the navigation seasons or parts thereof over its entire course or in some particular segment; therefore, the term N.R. is usually supplemented with an indication as to what kind of ships the river is accessible to and over what distance. Navigable depth should be greater than the ship’s draught by a certain value conditioned by navigation rules.

Navigation – (1) sailing, shipping industry; (2) period during which shipping is possible in various seas and oceans. (3) one of the main sections of the ship handling

science that deals with methods of choosing the shortest and most optimum route of a ship as well as techniques of safe navigation despite hazards that occur at sea.

Navigation Aids – system of shore-based and floating signal beacons, largely illuminated but sometimes sonic, used in seas, lakes, bays, straits, and estuaries of large rivers, where ships sail, to facilitate normal shipping operations. N.A. include light-houses (shore-based and floating), leading beacons and identification marks, buoys, pole beacons, etc. Floating markers (buoys, pole beacons) in seas and on large lakes are positioned by coordination system.

Navigation Period – natural, ice-free period using waterways for transportation purposes. N.P. may be extended through the use of ice-breaking ships. As far as rivers are concerned, they are distinguished between physical and actual length of navigation. Physical duration of navigation is understood as a period from the moment of ice removal from a waterway to the moment of grease ice arrival. The actual duration of navigation is the period from the moment of sailing of the first ship in spring to the moment of last ship sailing in autumn past a particular flood measuring post. The actual period of navigation may equal physical navigation or it may be shorter. In some cases, the actual period of navigation may be longer than physical (when ships follow the ice-breakers before the commencement of ice drift, etc.). In the North Caspian, N.P. lasts from March to November. In the Middle and South Caspian, N.P. lasts all year round.

Necton – actively floating organisms living in water.

Neft Dashlary (Neft Daslari) – see *Neftyanye Kamni Oil Field*

“Neft” (“Oil”), Russian Partnership – financial oil corporation and one of Russia’s major oil companies early in the twentieth century. Established in 1883, it united the firms “Baku Oil Company”, “Neft,” “Balakhano-Zabrat Company,” and others. It owned oil fields in the Districts of Baku, Grozny, Ferghana, and Ukhta. It also owned the “Conductor” Shipping Line, kerosene and chemical plants in Baku, and tankers for the carriage of oil products.

Neftchala – city since 1959 and district center of Neftchalinsky District from 1973, Azerbaijan. The city name has to do with the oil-bearing characteristic of the city environs and is formed by Azerb. *neft* (“oil”) and *chala* (“flat enclosed basin; a depression almost unnoticeable in relief” or “a hollow in which there is oil”). Situated 170 km south of Baku, in the Kura River delta, 12 km from the Caspian seashore and near the railway station Neftchala. There is an oilfield 12 km south of the Kura River mouth. There is also an iodide-bromine plant and fish farm.

Neftchala District – administrative-territorial unit instituted on February 11, 1940 in Azerbaijan. During the years that followed, ND was incorporated into Khillin and Salyan Districts until April of 1973, when the district again became an independent

administrative-territorial unit. Its area is 123.3 thou ha., and its population is 74 thou people (2001). There is one city in the district (Neftchala), 3 towns, and 48 villages and settlements. The district is rich in natural resources: oil, gas, iodide, bromine, commercial-grade salt, and cooking salt. The Republic's major river, the Kura, flows into the Caspian Sea here. Shirvan and Mugan Lowlands make it possible to cultivate virtually any agricultural crops and rear livestock. Oil, gas, chemical, fishing, and agriculture figure prominently in the district economy.

Neftyanje Kamni Oilfield (Neft-Daslari) – oilfield 50 km east of Apsheron Peninsula, Azerbaijan. Large-scale geological exploration of NK area was carried out from 1945 to 1948. In 1948, Chernye Kamni (Black Stones) was visited by a team of experts headed by N. Baibakov (subsequently, Chairman of USSR Gosplan). Among the experts was S. Orudzhev (subsequently, the USSR Minister of Gas Industry) and A. Aliev, who conjectured that the sea was rich in oil. Additionally, the team included rig-builders who set up the first production facilities on piles. NK Oilfield was discovered in 1949, when the first 1100 m deep oil well drilled by a team of drillers headed by M. Koverochkin produced a daily yield of 100 t of oil. By that time, the geographical term Black Stones was actually replaced with NK. In 1951, commercial development of the field commenced, and the first tanker with oil was sent to the shore.

In 1952, for the first time in the world, construction of a ramp intended to link man-made metal islands began. Oil is recovered from more than 20 horizons, which is a unique phenomenon. Since 1949, 1940 oil wells at the field have been drilled, producing 60% of all sea oil in the USSR. By the end of the 1990s, there was a well stock of 472 wells, of which 421 were in operation. The mean daily yield is 1,800–2,000 t of oil; 50% of the producers are watered-out. The residual recoverable oil reserves at the field equal 21 million tons. The field is linked with the mainland by a 78 km-long subsea oil pipeline with a diameter of 350 mm. By the end of the 1990s, 2,000 people were working at the field.

Neftyanje Kamni Settlement (Neft-Daslari) – town in Azizbek District, Baku (from 1952), Azerbaijan. It is set up on the Caspian Sea, 42 km to the southeast of Apsheron Peninsula and 110 km from Baku on metal ramps built around the so-called Black Stones – a stone ridge (shoalbanks) hardly visible on the sea surface. This is Azerbaijan's easternmost settlement. To commemorate the discovery of oil here, Black Stones were renamed Neftyanje Kamni.

Black Stones are mentioned in the 1897 sailing directions. In 1949, oil extraction from the seabed commenced here, and in 1952, a settlement for oilmen was built. At the location of the shoalbank, to lay down a proper foundation, seven decommissioned ships were sunk, among them the first oil tanker, “Zoroastr”.

NKS is regarded as the capital of the Caspian shelf. The construction of the settlement began in 1952. Two 250 kW power plants were built along with a boiler-house, an oil loading station, cleanup plants, 16 two-story buildings, a hospital, a bathhouse, etc. By 1960, the building of Baku Oil Technical Secondary

School was completed, along with a soft drink bottling plant, two 5-story hostels, and one 9-story residential building. A park with trees was laid out. From 1976 to 1986, the construction of oil-loading stations, three 5-story hostels, a canteen, a hospital, 2 oil-gas compressed-air plants, a potable water bioplant, and two 350 mm subsea oil pipelines leading to Dubendy terminal were completed. The ramps are used for motor traffic. Regular boat traffic runs between NKS and Baku Seaport.



Neftyanje Kamni settlement (Neft-Daslari)
http://narrow.parovoz.com/gallery/AZ/20060806_4997.jpg

Neftyanje Kamni, Shoalbank – surrounded by stone reefs, in between which are subsea and above-water stones. The northern and southern harbors are at the western shore of the island and are formed by sunken vessels. Here there are drilling rigs of the oilfield Neftyanje Kamni. All of these are linked by ramps on which the Neftyanje Kamni settlement oilfield operators.

Net – fishing gear used to trap fish on a commercial scale. The upper part of the net is furnished with various buoys, while the lower part has sinkers. Long ropes (cables, drags) are attached to both ends of the river sweep net, and it is pulled out onto a ship or on the shore. Depending on the design and the size of the mesh, N. are distinguished as river sweep nets, seashore N., lake sweep nets (large, small, winter, twin N.), pelagic (purse, semi-purse), seine N. (fishing trawls), and brace N. A stationary N. is a stationary trap.

Nikitin Afanasiy (unknown–1472) – merchant of Tver and Russian traveler. At the time of N., there was but one safe way overland from Europe to the rich countries of Asia: by way of Russia and the Caspian Sea. In 1466, N. set out to promote trade

from Tver down the Volga, reached Derbent by sea, then crossed the Caspian Sea and arrived in Persia, where he lived for about a year. In the spring of 1469, N. arrived in Ormuz and by the Arabian Sea reached India, where he lived for about 3 years, traveling extensively; on the way back, he visited Ormuz again, reached Trabzon, crossed the Black Sea, and in 1472 came to Kafa (Feodosia). During his travels, N. kept a diary making notes that contained all kinds of information about the population of India, its economy, religion, and lifestyle as well as about nature. The notes are known in literature as a book titled “Travel Beyond Three Seas, 1466–1472”.

Niz, Ponizovye (Lower Part, Low-Lying Area) – name used in the sixteenth century, following the conquering of Astrakhan by the Russians, of the extensive Circum-Caspian area.

Nizhne-Volzhsy (“Lower Volga”) Territory – formed within the RSFSR boundaries in 1928, its center is Saratov City. Its area is 324.3 thou km², and its population was 5,5 mln people. The territory included Kalmyk Autonomous Region, Astrakhan, Saratov, and Stalingrad Provinces. Additionally, it included the ASSR of the Volga Germans who had settled in the Volga area following the publication by the administration of the Empress Catherine II of the Manifesto dated July 28, 1763 that legitimated the ownership of land by German settlers in Russia. Under the October 19, 1918 Decree signed by V.I. Lenin, those Germans were granted an autonomy called “Labor Commune of the Volga Germans,” Russia’s first nationality-based territorial entity. In December of 1924, the Germans’ regional autonomy was transformed into an ASSR of the Volga Germans with an officially-recognized German Language. The German Republic area was 27.4 thou km², and the Kalmykian Region area was 69.6 thou km². The entry of these nationality-based entities in the NVT was based on the voluntariness principles. The Kalmykian ethnos in the area ranked 6th by population. In 1934, the NVT was split into Saratov and Stalingrad Territories. Stalingrad and Kalmykian Regions as well as Astrakhan District were included in Stalingrad Territory.

Nobel Ludwig Emanuel'evich (1831–1888) – son of Emanuel (Immanuil) Nobel, a highly educated person who had a gift of technical foresight. He was a keen businessman. L.N. bought Sherwood’s plant in Vyborgskaya Storona (Petersburg), where he deployed a new production line, based mainly on Artillery Department orders. The enterprise made equipment for Izhevsk Plant, water turbines for Sestroretsk Plant, lathe-drilling-machines for Perm Canon Works, Petersburg Ammunition Factory, and Tula Fire-arms Plant. L.N. took interest in work on geology, political economy, philosophy, read fiction, and loved poetry. His favorite poet was Voltaire; his ideal of a statesman was Peter I. L.N. knew 5 languages: Swedish, Russian, French, German, and English.

Early in the 1870, his brother Robert N. set out for the Caucasus to procure nut-trees to make the stocks of small-caliber guns that were to be made at Izhevsk Plant. When in Baku, he took interest in oil business and used his brother’s money to set

up a photogenic kerosene plant, having bought for Rbls. 25,000 a small factory on the outskirts of the city. At the same time, he purchased several oil-bearing areas at Sabunchi. In 1876, L.N. came to know the oil industry business in Baku and realized that it was necessary to improve it. He intended to replace manual labor in moving oil from the oil fields to oil refineries with pipes and a steam-operated pump and to organize transportation of end products over the Caspian Sea and the Volga in iron barges and along railway in tankers.

In 1876, L.N. began working on the program article “View of Baku Oil Industry and Its Future.” To him the development of oil industry was the purpose of his life. He was the first to design and build an oil pipeline with oil heating from the rigs to a refinery. From his drawings, the world’s first oil tanker “Zoroastr” was designed and built in Sweden at Motall Ship Factory. After successful operation of this tanker, the Nobel brothers built a number of tankers: “Moisey”, “Magomet”, “Brakhma”, “Socrat”, “Spinoza”, and “Darvin”. L.N. introduced the use of crude oil in ship engines. He invented a system of oil injection to ensure a better combustion and installed the system on his ships. He was the first to offer metal tanks for oil and oil products storage. Later, L.N. became the principal agent of the “St. Petersburg French-Russian Dynamite Company.”

In 1879 in St. Petersburg, the Emperor Alexander II approved the establishment of the Joint-Stock Company for oil production “Nobel Brothers” (cable address “Branobel”) with authorized capital of Rbls. 3 million. The company had the following promoters: Ludwig Nobel, Alfred Nobel, Robert Nobel, P.A. Bilderling, A.A. Bilderling, I.Ya. Zabelsky, F.A. Bloomberg, M.Ya. Belyamin-Senior, A.S. Sundgren, and B.F. Wonderlich. At the same time, a contract for the purchase of the Oil Fields at Rakhmany from the oil industrialist I. Gadzhinsky was signed, and in 1905 oil-bearing areas were purchased from the industrialist A.Ya. Adamov. During the 35 years that followed, the Partnership built the following plants in the vicinity of Baku: kerosene, oil-making, viscose, benzene, paraffin, two sulfuric acid plants, one for alkaline waste regeneration, a soda plant, a mechanical plant, gas-making facilities, and a lumber mill. Over the same period, 581 million poods of kerosene and 1,130 million poods of fuel oil were produced. For the first time in Russia, oil pipelines were built and oil products were carried over the waterways. After L.N. died, the Partnership was headed by his son, Emanuel Ludwigovich (1859–1932), and the mechanical plant in Petersburg was headed by the second son, Karl Ludwigovich (1862–1893).

L.N. was one of the most active members of the Russian Technical Society (RTS). He wasted no time supporting the existing free schools and training courses for workers, and every year he invested Rbls. 5,000 in the advancement of technical novelties. After he died, RTS established prizes and a Medal named after Ludwig Emanuel'evich Nobel, which were awarded every 5 years – “For Best or Outstanding Inventions in the Field of Metallurgy or Oil Industry.” The medal was awarded for the first time in 1893 to A. Stepanov for the new theory of kerosene lamps. The last winner of the medal (1905) was A. Nikiforov for a unique development in oil industry. At present, the prize has been revived by the Russian Industrial Society, the successor of the RTS.



Nobel L.E. (<http://hd.se/familj/slaktforskning/wp-content/uploads/2008/10/ludvig-nobel-1831-1888.jpg>)

Nobels – dynasty of prominent Russian industrialists. The founding father – Emanuel (Immanuel) N. (1801–1872) was born at Goevli, Sweden. At 25, he became an architect, taking interest in invention, and worked at a small caoutchouc factory. In 1833, nearly bankrupt, N. left Sweden. In 1837, at the invitation of the Russian counselor of state, L.G. Gartman, E.N. came to Petersburg where, in association with General K.I. Ogarev, he set up a machine-building plant. The enterprise manufactured battleships, steam engines for military ships, screw piles, and other items for the navy department. In 1846, N. commissioned a second plant to make mines, steam engines, machine-tools, etc. During the years of the Crimean War, E.N.'s plants produced hardware for the mine barrage in the Gulf of Finland. As far back as in 1840, the entire Nobel family moved to Petersburg: the wife Andrietta and three sons – Robert, Ludwig, and Alfred (Emil, the youngest son, was born when the family arrived in Russia).

After the Crimean War ended, the military orders for E.N. were canceled. Having settled matters with creditors with difficulty, E.N. with wife and the son Emil returned to Sweden. From then on, the dynasty falls into two branches. Ludwig N.,

who founded with brother Robert a firm of his own, becomes the head of the Russian branch. The foreign branch was headed by Alfred Bernard N. who became world-famous as the inventor of dynamite and subsequently established the Nobel Prizes (from the year 1895, the prizes have been paid out from the interest on his capital of Swedish Cronas 30 million).

Nogai Steppe – see *Terek-Kuma Lowland*

Nogaitsy (“Nogai People”) – a people in the Russian Federation (90.7 thou people in 2002), mainly in Daghestan (to the north of the Sulak River as far as the Kuma River – 38.2 thou people). They are in Stavropol Territory as well as in Karachaevo-Cherkessia, Chechnya, and Ingushetia. Their language is Nogai of the Kipchak group of Turk Languages. They speak two dialects: Karanogai and Kuban and are Sunni Moslems.

North (Northern) Caspian – northern shallow-water part of the Caspian Sea at the abs. level of -27 m with an area of around $105,000$ km² and a water volume of 490 km³, around 0.5% of the total water volume of the sea. The whole of N.C. is within the shelf zone, the prevailing depths being 0–5 m, with the shelf edge not exceeding 15–20 m. By bottom topography, N.C. is a stepped, gently-sloping and inclined plain separated from the Middle Caspian by the denting Mangyshlak sill. The seabed relief is structured by irregularities (islands, shoals, furrows, and hollows). For this reason, the morphometric characteristics of N.C. vary substantially, subject to the sea level position. Despite the very small volume, it is this part of the Caspian that process for the maintenance of the high bioproductivity for which the sea is famous. Conducive to the formation of high bioproductivity of N.C. is the favorable combination of natural factors, including abundant river runoff (over 80% of the total runoff going to the sea, mostly by way of the Volga River), which brings a large amount of nutrients; intensive heating during summer and the long vegetation period; rapid turnover of biogenic substances; and adequate ventilation of waters (except the areas with near – bottom hypoxia). As a result, the N.C. water area is the habitat of numerous valuable fish species, above all, sturgeons. Salinity of N.C. is low even for the Caspian Sea as a whole. This has to do with the huge quantity of river runoff arriving in N.C., which accounts for about one half of the total water volume in this part of the sea. The shallowness of N.C. and continental nature of its climate, with considerable seasonal variations of water temperature (from 0° in winter to 24–25°C during summer). From December to March, the N.C. water area usually freezes, although the ice cover is unstable. Depending on the volume of river runoff arriving in N.C., significant seasonal and year-to-year variations of salinity are observed. Over the last 50 years, mean salinity of N.C. has varied from 6.5 to 10.5‰, while the eastern part of the water area has been up to 11‰. Typical of N.C. water area are the maximum sea-wise spatial differences of salinity: from the river delta to the boundary with the Middle Caspian it increases from 1–2 to 10.5–12‰.

The impact of Volga waters on hydrological conditions of N.C. in large measure depends on the patterns of runoff distribution in the delta and on its arrival in the sea. These factors are, in turn, determined by the water content of the river, delta morphology, as well as by water management activities on the river (dredging the Volga–Caspian Canal, performance of the water diseer). During the long lowering of the sea level and delta reconstruction, the Volga runoff is focused on two major systems of arms: western (Bakhtemir) and eastern (Buzan). As the sea level rises and the maritime part of the delta is flooded, the Buzan runoff increases.

Of fundamental importance to N.C. hydrology are the large-scale processes of fresh and sea waters mixing. The zone of mixing freshened North-Caspian and more saline Middle Caspian waters actually encompasses the entire N.C. water area. The isohaline of 11.5‰ is assumed to be its sea boundary. The primary structural element of the water mixing area in N.C. is the frontal zone, where maximum transformation of the waters occurs and high salinity gradients are observed. The quasi-latitude salt-bearing front of N.C. reaches its maximum development during the spring-summer season and is approximately between the isohalines of 4–10‰. The position of the frontal zone generally is quite stable even though it is subject to seasonal and year-to-year fluctuations. The frontal zone is, on average, distanced 80–120 km from the delta margin, while the mixing of river and sea waters is most intensive where the main jet of Volga waters passes (i.e. in the northwestern area of the N.C.). This area is characterized by high horizontal gradients of salinity: 1.2‰/km.

Significant variations of hydrological conditions in N.C. (Volga runoff, salinity) at different values of the sea level are accompanied by the reconstruction of plankton and benthos complexes: decline (increase) of the population of fresh-water, slightly-saline water and brackish-water species, and, accordingly, by increases (reduction) in the sea species and a change in the fish capacity of the sea.

North Caspian Roach (*Rutilus rutilus caspicus*) – semi-andromous fish. One of the most plentiful commercial species of the Caspian Sea. Its body is tall. Its side-line contains from 42 to 47 paleolas. The fins are dark with gray at the edges. In autumn, the fins often acquire a reddish tint. In summer, fattens across the entire Caspian water area, at times occurring near Makhachkala, sticking to depth of 2–6 m, with water salinity not exceeding 7–8‰. Feeds mainly on mollusks. In autumn, approaches the shores, often coming into river deltas. After spring ice-melting, at water temperatures of 2–3°C, at the end of March and early in April, NCR runs into the deltas of the Volga and Ural. The peak of the run occurs at the end of April to early May, at water temperatures of 7–9°C.

The species reaches sexual maturity at the age of 2 years. The main spawning occurs from the end of April to the end of May in inundated lakes and flood plain water bodies of the middle part of the Volga delta. The fish eggs more often than not stick on the dead plants of the previous year. It takes the eggs 5–6 days to develop. A spawned NCR immediately runs into the sea for fattening. Its length of life is up to 8 years. NCR's typical size in commercial conditions is between 18 and 36 cm, even

though individuals as large as 50 cm in length are also encountered. NCR's mass is 40–400 g, with fat content from 2.5 to 5%. NCR used to be (along with herrings) the most plentiful fish of the Caspian Sea in the past, and its catches were as large as 1 million quintals. At present, maximum catches of NCR equal 10,000 quintals.



North Caspian roach (<http://kolons.ru/assets/images/3.png>)

North-Caspian Shipping Company – established in 1922 as a State Caspian Shipping Line. In 1938, changed name to Astrakhan anchorage bulk-oil shipping line “Reidtanker”. In 1940, it becomes the Caspian anchorage bulk-oil shipping line “Reidtanker”. In 1955, it changed its name to the Caspian State Anchorage Bulk-oil Shipping Line “Kaspar” Authority. In 1961, it was again renamed the Astrakhan Authority of the Caspian Shipping Company. In 1987, it became the Astrakhan Industrial Association for Sea Transport. Finally, in 1993, it was renamed the North Caspian Shipping Company. Its ships deliver cargoes of freighters from Russia's river ports to any ports of the Caspian, Azov, and Black Seas and undertake dredging and surveying as well as towing of floating facilities along the inland river routes. It also has an extensive ship-building and ship-repair base.

North Caucasus-Mangyshlak Oil-And-Gas-Bearing Province – in Russia (within Rostov Region, Krasnodar and Stavropol Territories, Kalmykia, Kabardino-Balkaria, North Osetia, Chechnya, Ingushetia, Dagestan) as well as Kazakhstan and Uzbekistan with an area over 530 thou km². Geographically, the province occupied part of the Circum-Black Sea and Circum-Caspian Lowlands Stavropol Upland, Kumo–Manych Depression, Mangyshlak Plateau and Ustyurt. Tectonically, N.C.M.O.G.P. is confined to the Scyth Platform, South–Mangyshlak–Ustyurt system of downwarps of Greater Caucasus of Turan Platform, and Indolo–Kuban and Terek–Caspian Troughs of the Greater Caucasus. Six oil-and-gas bearing complexes are distinguished: Permo–Triass, Jurassic, Lower Cretaceous, Upper Cretaceous, Paleogenic and Neogenic. The first productive oil wells were drilled in the western part of the North Caucasus in 1864. The first oil in the eastern part of North Caucasus was obtained in 1893 (Old Grozny Fields). By 1994, there were over 280 oil, gas, gas condensate, and oil-and-gas-condensate fields discovered in the province. More than 200 fields are being developed. The best-known fields in Russia are Sukho–Kumskoe, Malgobek–Gorskoe, Old Grozny Field, Oktyabrskoe,

Velichaev–Kolodeznoe, Mirnenskoe, and others. The oils of N.C.M.O.G.P. are low-sulfur, waxy, and highly waxy, with great variations of density and tar content (in Cainozoic deposits, oil density reaches 931 kg/m^3 , while in Mesozoic it is $811\text{--}880 \text{ kg/m}^3$). The oils are of a naphthene-methane composition. Gases of the gas fields contain CO_2 up to 6%, N_2 up to 5%, and H_2S up to 1.8%. The fields, for the most part, are at an advanced stage of development, with the major administrative and industrial centers of field development being in Krasnodar, Stavropol, Grozny, and Makhachkala.

North Cheleken Bay – the southern part of Turkmenbashi, formerly Krasnovodsk Bay, Turkmenistan. Separated from the Caspian Sea by the North Cheleken Spit. Entry in the bay is determined by the Caspian Sea level.

North Cheleken Spit – the limit of the west of Turkmenbashi Bay, Turkmenistan. The spit is low-lying, sandy, covered dwarf with thinned vegetation.

“North–South” International Transport Corridor – historically, the Caspian Sea Basin has been the crucial transit center of goods’ exchange between Europe and the countries of South Asia. The Caspian Sea is the shortest link between Russia’s European part and the countries of the Indian Ocean, the Middle East, and West and Central Asia. In this connection, the issue of turn-out No 9 of the international Trans-European corridor (Helsinki–Odessa) in the direction of Moscow–Volgograd–Astrakhan with an exit to the Caspian Sea has been actively discussed over the last 15 years. A decision to go ahead with such a plan was made at the Third All-European Transport Conference (June, 1997, Helsinki). This issue was reflected in the concept of the state transport policy approved by the RF Government in 1997. In April of 1999 in Tehran, a memorandum on cooperation in the matter of Indian transit between the commercial firms “Vagna” (Russia), “Volga–Vaster” (Russia), “Lakor” (Russia), “Irsotr” (Iran), “Iranohint” (Iran), and “Regi” (Iran) was adopted. On June 22, 1999, the aforesaid forms signed a general agreement in Moscow on transportation of export–import containers along the international transport corridor Sri–Lanka–India–Iran–Caspian Sea–Russia. On December 25, 1999, the first container was shipped along this route.

Trial transportation of 40-foot long containers over the new route showed that the time of transit from Bombay to Astrakhan may only take 15–17 days and 21 days to Moscow, the cost of transportation being USD 2,500–2,600. Under the proposed scheme, cargoes shipped in superlarge containers from the Indian ports shall be destined for the Iranian port Bander–Abbas, then carried on by trucks over the territory of Iran to the Iranian Caspian port Anzali, whereupon they are shipped to Astrakhan and delivered by railway and trucks to destinations in Russia and the CIS. Direct delivery of containers by “river–sea” vessels from Anzali to Moscow and even to Murmansk and to the Black Sea is possible, too. Calculations indicate that the transport corridor in question would make it possible to shorten the delivery time by 20–30% and cut transport costs by 20–25%. Experts believe that by 2010 the annual freight turnover through the corridor may reach 15–20 million tons.

On September 12, 2000, while the 21st International Euroasian Transport Conference was held in St. Petersburg, the Transport Ministers of Russia, India, and Iran signed the Intergovernmental Agreement on the International Transport Corridor “North–South”. The Agreement was ratified on 12.03.2002.

Novocaspian Transgression – Late Holocene transgression of the Caspian Sea when its level was 6–11 m higher than today. There were 2 phases. At the time of the N.T. maximum, which was only 5,000 years ago, the sea level reached an elevation of –22 m (–20 m) absolute height, and there was no Volga Delta as it exists today.

Novosadok – local name used in the North Caspian for a thin layer of young ice that is dangerous to small wooden vessels because it is very sharp and may cause considerable damage (sometimes called “cutter”).

Novy Ostrov (new island) – part of Tyulenii Islands, situated at the entrance to Mangyshlak Bay, Kazakhstan. When the Caspian level is low, the island shores are fringed with a dry strip.

Novy Uzen (New Uzen) – city (from 1968) in Mangistau Region, Kazakhstan, situated roughly 110 km east of the Caspian seashore. It has a railway station (railway line N.U.–Aktau–Makat) and is a center of oil and gas production. It has a gas processing plant. The oil pipeline Uzen–Atyrau–Samara and the gas pipeline Uzen–Bainau begin here.

Nowshahr – city-port and administrative center on the Iranian shore of the Caspian Sea, Mazandaran Province. Its population is 16.3 thou (1992). The city stretches along the shore for more than 2 km. Linked with other maritime cities by the trans-Iranian Highway. The population is basically engaged in agriculture. N. port was built at the mouth of the Nowshahr River from 1933 to 1940. The port’s harbor is formed by two stone malls protruding northward from the shore. The malls’ interior walls are used as jetties. The overall length of the wharf is around 400 m, with depths at the jetties of 1–2.5 m. The port harbor is often subjected to river siltation, so it requires regular dredging. The port has a 6 km-long narrow-gauge railway and ship-repair shops.

Nulevoi Sbros (“zero discharge”) – principle whereby all wastes are removed to shore bases at all stages of offshore fields development and operation to ensure the environmental safety of the Caspian Sea.

O

Oblivnoi (“Slipware”) Island (local name Chigil) – part of the Baku Archipelago, situated 6.7 km southeast of Byandovan Cape, Azerbaijan. Its area is 0.134 km², its length is 0.54 km, and its width is 0.3 km. It is elongated from the southwest to the northeast. O.I. is elevated, with a maximum height of 43 m. It has the shape of an irregular truncated cone with precipitous shores. Its origin is mud volcanic. There are several active mud volcanoes in the southeastern part of the island, which are constantly pouring new mud flows onto the island surface, hence the name of the island. Other hypotheses indicate that “the island is round, washed over by waves on all sides.”

October Revolution Canal – irrigation canal stretching 70 km from the Sulak River to the City of Makhachkala and supplying water to the extensive areas of Terek-Sulak Lowland. Built in 1923. The canal water is used for water supply in the Vuzovskoe Lake- Storage Reservoir and for fish-breeding in Akkol Lake.

Offshore Kazakhstan International Operating Company – in 1997, during the state visit of Kazakhstan’s President to the USA, the Production Sharing Agreement on the North Caspian was signed involving the participants of the International Consortium “Kazakhstan-Caspiishelf” (KCSH). In order to proceed with the exploration drilling stage, the Offshore Kazakhstan International Operating Company (OKIOC) was established, and all participants of KCSH became its members. In September of 1999, Philips Petroleum Company and INPEX (Japan) joined the Agreement. The Production Sharing Agreement (PSA) between Company shareholders and Kazakhstan in respect to the Kazakhstan Shelf’s northern blocks. The list of OKIOC shareholders includes: Ajip (14.29%), British Gas (14.29%), Exxon Mobil (14.29%), Shell (14.29%), TotalFinaElf (14.29%), BP Amoco (9.5%), INPEX (7.14%), Philips Petroleum (7.14%), Statoil (4.8%). Under the signed PSA, shareholders of OKIOC had a prior right of making a choice of sea blocks as investors of the already completed exploration work. In all, foreign companies were entitled to choose 12 blocks: 2 blocks each (BP and Statoil at the early stages of project implementation acted in partnership). On the strength of the data that existed at the time, a choice was made of the blocks within which promising oil-and-gas

bearing reservoirs in East and West Kashagan, Kairan, Aktota, and some others were discovered.

Ognevka – a lighthouse on the shore marking the way for fishermen setting out for the sea in the North Caspian.

Ogurchinsky Island – situated at the margin of a shallow area in the southeastern part of the Caspian Sea, Turkmenistan. O.I. is an island bar that was formed during the second stage of the Novocaspian Transgression. It confines Turkmen Bay on the west. O.I. is indicated and designated in the maps of the 1715 survey; the name originates from Ogurcha Stow, known from 1392 on the shore opposite the island. The stow could have been named after the Turkmen racial and tribal name of “Ogurjali.” Others suggest the name means “place of refuge from pursuits.” In the 1780s, O.I. was a group of the island Aidak, Tyulenii, Kamysly-ada, and others that merged as the Caspian Sea level decreased, becoming one island, Ogurchinsky. The length of O.I. stretching in a narrow strip from the north to the south is around 40 km; the width is 0.5–2 km. The area is around 45 km². The western shore of O.I. is winding, while the eastern one shore is straight. The surface is low-lying, covered with short sandy mounds overgrown with grass and shrubs. These are good ranges. In 1982, a sanctuary was established here. The availability of rangeland vegetation provides the necessary conditions for breeding valuable species of hoofed animals here: Persian gazelle and Asiatic wild ass, with subsequent settlement of these in favorable habitats.

Oil – (*neft'* in Russian, from Pers. and Turk. *neft*) – liquid fuel mineral, usually of dark brown color. Its density is 650–1,040 kg/m³, and its combustion heat is 43.7–46.2 MJ/kg (10,500–11,000 kcal/kg). By composition, oil is a complex mixture of paraffin, naphthene, and, to a lesser extent, aromatic hydrocarbons. The content of carbon is around 82–87%, most of the rest being hydrogen (11.5–14.5%). Impurities occurring in oil (4–5%) are represented by compounds containing oxygen (mainly, naphthene acids), sulfur, and nitrogen, resinous substances, and asphalt matter. O. is separated into low-sulfur (sulfur content under 0.5%) and sulfurous (over 0.5%); by resin content – into low-resin (under 18%), resinous (18–35%), and high-resin (over 35%). Oil associated minerals are often oil well gas and water. As a rule, O. occurs in porous or fissured rocks (sands, sandstones, and limestones). By applying distillation to O., benzene, naphtha, kerosene, oils, paraffin, and other products are obtained. The characteristic trend is toward a maximum O. utilization, which yields refined products, and the use of O. as a chemical raw material for production of synthetic materials. The major O. fields are around the Persian Gulf, the Caspian Sea, the North Sea, West Siberia, and the Gulf of Mexico. O. reserves are estimated at 1,200–6,400 billion barrels (2008).

Oil-And-Gas Terminal – ground or offshore plant designed for collection and temporary storage of oil or liquefied natural gas from pipelines or tankers.

Oil Barons, Oilbarons – name given to major oil industrialists in Azerbaijan from 1880 to 1920. In 1884, O.B. set up in Baku their own organization called “Council

of the Congress of Oil Producers” to facilitate development of the oil business. The council published its own magazine, “Oil Business,” and had a library, a hospital, a school, and a drugstore. For 6 years (1884–1889), the Council head was Ludwig Nobel. O.B. invested money to keep administrative, social and municipal services alive; these, in turn, attended to matters of city lighting, construction of housing and telephone stations, road building, street development, introduction of “konkas” (“konka” – a horse-driven tram), laying out gardens and parks, setting up casinos and hotels, etc. The local O.B. entered into a kind of competition, building luxurious palaces as their residences. Each such palace until now remains a real architectural masterpiece, an excellent monument of architecture.

Among the most famous philanthropist O.B. was **Gaji Zeinalabdeen Tagiev (1823–1924)**. He made a considerable contribution to the development of education in Azerbaijan. In 1901, he personally built in Baku the Russian-Moslem Women’s Upper Secondary School named after the Russian Tsarina Aleksandra Fedorovna, the wife of the last Russian Emperor Nikolay II. This was the first Women’s Upper Secondary School not only in Baku but in the entire Moslem world. The school’s head mistress was Tagiev’s wife, Sonja Khanum. At present, the school’s building is a historic monument and houses the Institute of Manuscripts. Additionally, Tagiev patronized 3 other major schools of the city: commercial, mechanical, and St. Nina Technical Secondary School. From 1896 to 1899, he built Baku’s first European-style Shopping Mall which is still used for shopping today.

Another O.B., **Aga Musa Nagiev (1849–1919)**, built a huge palace, subsequently known as Ismailia, to commemorate his son Ismail who died of tuberculosis (his father’s millions were unable to save him from death). The palace was built by the Polish architect I.K. Ploshko in the Venetian-Gothic style, and its resemblance to “Palazzo Contarini” of Venice is striking. In 1918, the palace was burned down, but it was restored during the Soviet period. At present, the building houses the Presidium of National Academy of Sciences of Azerbaijan. Nagiev’s other gift to Baku was the largest city hospital, built in 1912 and shaped as the Russian letter “H,” symbolizing the initial letter of Nagiev’s family. Additionally, Nagiev was a patron and guardian of one of the largest secondary technical schools for men, a non-classical secondary school which at present houses the State Institute of Economics.

D.D. Mitrofanov built in Baku his residence whose façade, contrary to Moslem canons, is decorated with numerous sculptures made of limestone: human faces, women’s bosoms, lions, bears, sturgeons, other representatives of flora and fauna, and Mitrofanov’s own monogram, “M.” In 1919, the building was leased to the French Embassy; it later it became an apartment house.

Oil Depot – a tank or tank farm usually of cylindrical shape and used for storing oil and oil products. Subject to tank position, they are distinguished as overland, semi-underground, and underground OD. OD may be fabricated of steel, ferroconcrete, plastic, earth (storage pits), or stone. Their storage capacity is usually up to 12,000 m³. To avoid an oil spill in case of a breakdown or fire, OD are often installed in pits or are surrounded by a fireproof wall or an earth bank.

Oil Derrick – a massive, usually metal structure housing equipment for dropping and hoisting of drilling tools, downhole engines, and casing tubes. D.R. is usually provided with pulley blocks and other mechanical lowering-hoisting facilities and the racks for drill pipes. Drilling rigs 9–58 m high are in operation. They are manufactured as three- or four-face pyramids or truncated pyramids and also A-shaped and are moved with a tractor or they are dismantled into separate blocks and then assembled in a new place.

Oil Diplomacy – internationally accepted notion meaning practical activity of foreign-policy, foreign economics, and energy departments, often in association with corporations, toward the attainment of objectives and discharging of tasks of foreign energy policy associated with the activity of all segments of the oil sector. Of late, it is also used in connection with diplomatic struggle around the Caspian oil transportation routes.

Oil Island – see *Cheleken*

Oil Pipeline – a complex of structures for pumping crude or refined oil between two points on dryland or at sea over long distances (hundreds and thousands of kilometers) from the areas of oil recovery to locations where the oil is processed or transported further. OP comprises a pipeline, oil pump-over stations, communication facilities, and auxiliary works. The Caspian area oil is transported by the oil pipelines Baku-Supsa (926 km), Baku-Novorossiisk (1,411 km), and Atyrau-Orsk, Uzen-Aktau, Uzen-Samara, Tengiz-Novorossiisk (1,589 km). The 1,730 km OP Baku (Azerbaijan)–Tbilisi (Georgia)–Ceyhan (Turkey) was built in 2006.

Oil Production – extraction (recovery) of oil and by-gas from the subsoil, including collection of these products and their preliminary preparation (i.e. removal of water and solid impurities). Methods of currently used in O.P.: adjustable recovery of oil by flowing well operation, oil lift with the aid of compressed air or natural gas (compressor recovery method and compressor-assisted gas lift), and deep-well pumps. Special techniques to enhance the productivity of wells and efficiency of oil recovery from the pools are used on a large scale: water injection into oil-bearing beds (peripheric, contour flooding, and central flooding), air or gas injection, reservoir fracturing, oil-well shooting, chemical and thermal treatment of oil-well holes, secondary operation of oil fields.

“Oil Production Partnership of the Nobel Brothers” (“Nobel Brs Partnership”) – oil-industry enterprise established in 1879 in Baku by the Nobel brothers – Ludwig (1831–1888), Alfred (1833–1896), and Robert (1829–1896) – from Sweden as well as by P. Bilderling. The “Partnership” began in 1873 when Robert passed through Baku in search of top-quality wood (Persian walnut and other species) for gunstock they were manufacturing in Russia. This was a time of oil fever, and Robert was quick to appraise the situation and invest all of his “Persian-walnut money” in the purchase of a small oil-refinery and kerosene plant. It took a few years for him to persuade his brother Ludwig to come to Baku, where they set up the “Partnership.” By 1884, their enterprise had an annual output of over 1.5 million tons of oil, which

accounted for 1/3 of the oil produced in the US. In 1880, the “Partnership” built at its shipyard in Tsaritsyn (Volgograd) two iron bulk-oil split-type barges of 900 t capacity to transport kerosene, and then two more barges of 1,640 t capacity. Furthermore, they built a large oil pump station in Tsaritsyn. The “Partnership” had oil depots from Astrakhan to Rybinsk. The Nobels built a shipyard in Astrakhan, too. The “Partnership” owned most of the oil fields and around 200 small oil refineries in the vicinity of Baku. By the end of the nineteenth century, the Nobel brothers controlled up to 90% of Russian oil, having effectively surmounted the Rockefellers’ famous “Standard Oil Company” The Nobels, therefore, are referred to as the “Russian Rockefellers.”

Beyond the recovery and processing of oil, the Nobel brothers advanced and developed the concept of establishing city parks in Baku. One of the parks they set up was on the boundary between the industrial and residential areas of Baku, or, like common people used to call them, “The White and Black Cities.” Here, they built their residence, which they called “Oil Villa,” and made a park around it. In 1882, they established following rule: all of their empty carriers coming back from Iran and Lenkoran in the south of Azerbaijan were to bring fertile soil for their allotments. With this soil, the brothers began to cultivate an area of over 10 ha, inviting the well-known European botanist E. Bekle, who had created numerous parks from Warsaw to Baku, to design their gardens. Bekle imported diverse species of plants and trees from Lenkoran, Tbilisi, and Batumi, and rare species were brought in from Russia and Europe. In the end, he managed to produce a huge “green ensemble” of more than 80 thou plants and arboreal species, including fruit trees, many of which had never grown in Baku. Irrigation of the park constituted a most serious problem, but Ludwig succeeds solved the problem by bringing back his tankers filled with water from the Volga. At a later date, he watered the park with special pipelines that used the water from steam generation at the oil refineries. Capital expenditure in the park exceeded Rbls. 250 thou, which was a spectacular amount at that time. The amount included the construction of a club (“The Upper House”), a library, and a house for the workers. Before long, the park became a favorite place of Baku dwellers. For all the money invested in this and other projects, and the energy that the brothers spent to keep up this “green mirage,” they could not be called philanthropists. They did not build a single monument of architecture in the center of Baku, unlike other foreign oil companies, such the Rothschilds or other “oil barons”. The Nobel brothers built the park with to improve the living conditions and leisure time of their engineers and administrators. Many Azerbaijanis wish and plan to conserve the Nobels’ heritage. After their villa is refurbished, it will be opened as a museum of oil and the Nobel. The establishment of the Nobels’ Environmental Center in the villa is also being considered.

Oil Products – mixtures of gases, liquids, and solid hydrocarbons of various classes obtained by oil refining or other methods of oil processing. Major OP groups: fuels (gases, benzene, naphtha, kerosene, fuel oil), oils, solid hydrocarbons (paraffin, ozokerite, ceresine), bitumens, and other OP (coke, benzol, toluol, xylol and others).

Oil Refinery – plant where various components of crude oil are separated, and the oil is processed into diverse oil products as well as into materials for use in other production processes. There are 4 oil refineries in the Caspian Sea area: in Azerbaijan – “Azerneftiyag” (Baku Oil Refinery) and “Azertanajag” (Novobakinsky Oil Refinery); in Turkmenistan – Turkmenbashi Oil Refinery; and in Kazakhstan – Atyrau Oil Refinery.

“Oil-Related” Postage Stamps – postage stamps showing various oil and gas recovery processes as well as oil and petrochemical industry. The first “oil-related” postage stamp showing the Baku fire-worshippers’ temple against the backdrop of sea oil rigs was issued in Azerbaijan in 1919 at a nominal price of Rbls. 25. Early in the 1920s, the first Soviet “oil-related” stamp showing hammer and sickle was issued in Azerbaijan. During the Soviet period, there were several “oil-related” stamps issued. The first postage stamp of an independent Azerbaijan Republic was also oil-related. It was to mark the 115th anniversary of the establishment of the Nobel Brothers oil company, “Nobel Brothers Partnership”. Its release in June of 1994 was timed to the ratification of the contract of the Western Oil Consortium in December of 1994. The stamp of 50 manat featured the Nobel Brothers Robert, Ludwig, and Alfred as well as Peter Bilderling, the founder and holder of the Partnership.

The 1994 anniversary was also celebrated in Turkmenistan, where four “oil-related” postage stamps of 1, 1.5, 2, and 3 manat were issued. The 1-manat stamp showed the Cheleken Island Mud volcano, indicating the presence of oil. The 2-manat stamp showed the first production well drilled on Cheleken Island; the 1.5-manat stamp showed the first twin-diesel tanker, and the 3-manat stamp, like the Azerbaijan stamp, showed the three Nobel brothers and Peter Bilderling. Additionally, a book of stamps of 5 manat was issued to commemorate the production of a billion poods of oil (“Nobel Brothers Partnership,” 1879–1906).

To date, over 170 countries worldwide have released around 2500 “oil-related” postage stamps. In 1974 the International Petroleum Philatelic Society was organized in the USA.

Oil Slick – oil layer floating on the surface of the seas, usually as a result of a tanker accident or from a leak from an oil pipeline or oil field.

Oil Stations – stationary (shore-based) or floating pumping stations for transferring oil and oil products, both when loading (filling) these in the ships (in the absence of supply by gravity) and during offloading (draining) from the ships and railway tanks. Floating OS are used to supply ships with liquid fuel (bunkering).

Oil Waste Disposal Vessel – industrial ship for collection of waste and oil products from the water surface. Until recently, various ships were used for these purposes; however, due to the growing pollution of seaport water areas and in view of the need to combat oil and oil-product spills from the ships in oil-field areas, they began building OWDV to special designs. OWDV are distinguished into port-assigned,

those cleaning isolated water areas, and marine (these include water areas of offshore oil fields). They are designed to contain the oil spills, collect oil products, and neutralize oil residues. They can take on polluted water from other ships.

Okarem – town situated on the eastern shore of the Caspian Sea to the north of Esenguli, Balkan Wylayat, Turkmenistan. Emerged as a result of oil exploration and production from 1961. Its population is 6,000, and it has oil loading terminals.

Old Safid Rud – see *Safid Rud River Delta*

Olearius (Ölschläger) Adam (1603–1671) – writer and traveler. In 1633, he went into service for Hottorn Herzog Friedrich of Holstein and participated in the embassy voyage to Persia (1635–1639). The route passed from the Baltic Sea to Narva then over land to Moscow. It continued by ship down the Volga (O.A. was a participant of sailing on board the “Frederich” ship) and across the Caspian Sea to Derbent, where again by land they traveled via Shemaha, Ardebille, Kazwin and Kashan to the then Persian capital city of Isfahan. Of great value are geographic and historical data about the voyage that were contained in detailed true descriptions by O.A. In 1635–1639, he made a map of Persia. On it, the Caspian Sea is presented as an elongated rectangle.

O.A.’s work “Description of a Journey to Moscovia and via Moscovia to Persia and Back” (1646, in Russian translation – 1906) is one of the most valuable sources of data about Persia (Iran) at the time in a European language. In 1654, O. published a translation of “Polystan” authored by the great Persian poet Saadi.

Olya – settlement situated on the right bank of Bakhtemir Arm in the Volga delta, 100 km south of Astrakhan, in the Liman District of the Astrakhan Region, 40 km from the Caspian Sea. Its population is around 3,000 people. Pursuant to the Decree of the RF President “On the Rebirth of the Russian Merchant Marine on the Caspian” (1992), a merchant seaport to handle 8 million tons of cargo per annum was built at Olya. In February of 1998, the RF Government passed the resolution “On Setting up the State Unitary Enterprise Seaport of Olya.” When the construction was over, the port become one of the largest transport-and-industrial complex, coordinating all modes of transport and providing for Russia’s foreign economic relations with the countries of the Circum-Caspian Region with a possibility of reaching Central Asian and southeastern basins as well as the countries of the Middle East. The port is the final point of the 9th transportation intermodal corridor, Saint Petersburg–Moscow–Astrakhan. The port complexes include the transshipment of containers, minerals and building materials, general cargoes, timber and saw timber, as well as a sea ferry service.

Onshore Lighthouse – a tower designed to emit light as an aid for navigators of vessels and also for showing safe entry into harbors, river mouths, and channels. In the Volga delta, the most well-known are the Chetyrekhbugorny lighthouse and the lighthouse on Iskusstvenny Island; on the Caspian shores are the lighthouses of Makhachkala, Bautino, Turkmenbashi, and others.

Operator Company – company appointed pursuant to a decision of the consortium and acts on its behalf in the sphere of oil/gas exploration, recovery, or transportation.

“Orel” (“Eagle”) – name of Russia’s first naval ship. The construction of a fleet for the Caspian Sea was initiated by the closest adviser of the Tsar Aleksey Mikhailovich (1645–1676), head of Posolsky and Malorossiisky Departments Afanasiy Lavrent’evich Ordin-Nashchokin. On June 19, 1667, the tsar decree was issued “to send craftsman from Astrakhan to the Khvalyn Sea to make ships in Dedinovo Village, Kolomensk District,” and for court nobleman Ordin-Nashchokin to follow up that ship-building trade at Novgorod State Department with the aid of Duma Deacons Gerasim Dokhtorov, Lukian Golosov, and Efim Yuriev.

The first ship was built at the shipyard of Dedinovo Village, Kolomensk District on the Oka River, not far from its confluence with the Moskva River. The building began in autumn of 1667. Among the workers sent to Dedinovo to build the ship were Russian craftsmen. Tree felling was done in the vicinity of Kolomna, while the best iron for ship building was supplied by Tula and Kashira Works. On May 26, 1668, the ship was launched for the final touches to be made. It had a water draught of 1.5 m, 3 masts, and was 24.5 m long and 6.5 m wide. The ship had 22 canons, with caliber ranging from 2 to 5 pounds. Orel’s hired captain was the Dutchman David Butler. Alongside “Orel”, a yacht, 2 sloops, and a boat were built. This was the first flotilla on the Caspian.

On May 7, 1669, the ship set sail for Astrakhan where it arrived in 3 months. Upon arrival in Astrakhan, it was placed under orders of the business yard. There are two versions regarding the subsequent fate of “Orel”. One version says that the ship was burned down at the time of resurrection of Stepan Razin; the other version insists that devoid of all the armament (the cannons were removed and were used to consolidate defenses of Astrakhan (1670)), “Orel” stood berthed for years in the Volga bypass Kutum.

In 1996, at the spit of the Oka and Roika Rivers, building of a monument to “Orel” was begun. Prior to 2002, a wooden model of the ship stood on a stele. Later, the model was bronzed. The “Orel”’s outline spire the Admiralty building in St. Petersburg.

Organization of Economic Cooperation – established in 1985 by Iran, Pakistan, and Turkey. In 1992, Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan, Tajikistan, and Azerbaijan joined the OEC. At present, it comprises 10 states (besides the aforementioned ones, Afghanistan is also a member), all with predominantly Moslem population. OEC’s main consultative body is the Board of Foreign Ministers or other representatives in the rank of a minister.

Oriental Company for Insurance Goods Depots and Goods Transportation with Loans Issue – joint-stock company. Established in 1893 in Petersburg. Dealt with freight and passenger traffic down the Volga and in the Caspian Sea, cargo insurance and acceptance for storage, issue of loans against goods, accepted for transportation or storage, and sale of oil products. The company owned depots for storing oil and dry cargoes as well as 1787 tanker cars. In 1903, invested capital of

the company equaled Rbls. 7.5 million (37.5 thou shares of 200 Rbls.). By 1914, the Company's possessions included: on the Caspian Sea – 40 steamships and 28 barges (out of this, 7 iron barges); on the Volga – 30 steamships, 37 iron and 64 wooden barges, as well as 5 freight-and-passenger motor boats. At Durt-Altyn (near Astrakhan), the Company had mechanical workshops and a housing settlement for workers.

Oriental Herring (*Alosa brashnikovi orientalis*) – medium-sized herring. The body is high, slightly-tinted, with a saggy abdomen, 25–33 cm long. The number of gull rakers range from 22 to 35. The number of vertebrae is from 46 to 53. Its geographic range is limited to the South Caspian coastal waters, from Gorgan Bay in the south to Krasnovodsk Bay in the north. Migrates over short distances. Spawns near the shores from March to May, usually at water temperatures of 17–18°C and higher.

Oseredok, Seredok – shoal in the Caspian Sea surrounded by deep area. O. may be submerged or above-water.

Osetrii, Sturgeon Akhan – two-panel trammel net for sturgeon fishing.

Ostan – administrative and state entity (province) in Iran (divided into 30 ostans).

Osushka (mudflats) – a strip of seabed that is drying up in shallow water but still adjoining the sea directly.

Osushnoi (Mud Flat) Island – situated near the southern edge of the shoal stretching 10 km miles to the southeast of Krasnovodsk Spit, Turkmenistan. One of the largest islands formed on this shoal.

Oxbow – part of the former river channel, it is filled with water in spring and stays that way until autumn when fish from the river find their way to this water.

Ozokerite – (from Greek *ozo* – “I emanate smell, smell” and *keros* – “wax,” “stone lard” or “mountain wax”) – mineral from the bitumens group. By chemical composition, it is a mixture of solid saturated hydrocarbons. The color is yellow, brown, and greenish, and the melting point is 52–85°C. Its hardness by mineralogical scale is –1. Genetically, O. is associated with paraffin oil fields; it occurs in the form of lodes and beds. When heated, it becomes soft and elastic. Refined O. is called ceresine. Used in varnish-and-paint industry and in medicine (radiotherapy) and has some other uses. Considerable reserves of lode and bed-type O. occur on Cheleken in Turkmenistan.

P

Pallas Petr Simon (1741–1811) – Russian natural scientist born in Berlin, he was a world renowned scientist and traveler in the eighteenth century. When he was already a well-known young German scientist, in 1767 he went to Petersburg where, in 1768, he became Professor at the St. Petersburg Academy of Sciences. He led the academic expedition to the central regions of Russia, to the Lower Volga area, the Circum-Caspian Lowland, the Middle and Southern Ural Mountains, and Western and Eastern Siberia. In 1793–1794, he visited the Lower Volga area, the Circum-Caspian Lowland, the Northern Caucasus, and the Crimea. He collected and analyzed an enormous amount of material in geography, geology, fauna, flora,



Pallas Petr Simon
([http://www.altairegion22.ru/
images/hist51_1.jpg](http://www.altairegion22.ru/images/hist51_1.jpg))

mineral deposits, forestry, mining industry, agriculture, ethnography, and others. P. also investigated the Ergeni Hills, and concluded that they represented “the ancient coast of the vast Caspian Sea.” He mapped a part of the Kalmyk Steppe extending out to the Northwestern Caspian, and wrote the book “Flora of Russia,” publishing it in two volumes in Latin (1784–1788) along with a summary list of insects. P. was a member of many foreign academies and scientific societies. After 1810, he lived in Berlin.

His most important publications in Russian related to geography are “Journey over the provinces of the Russian Empire” (in 5 volumes, 1773–1788), “Notes on traveling to the southern regions of the Russian Empire, 1793–1794” (in 2 volumes, 1799–1801), and “Short physical and topographic description of the Tavia Region” (1795).

Paraffin (from Latin *parum*, meaning “barely” and *affinis*, meaning here “lacking of affinity”; reflects P. neutrality towards reagents) – a mix of solid saturated hydrocarbons, P is present in some types of crude oil, creating some difficulties in some of their uses. Pure P. is a colorless wax-like mass. Its melting temperature may vary from 42 to 54°C depending on its purity. P. is derived mostly from oil and as a result of synthesis. It is used as insulation material, for impregnation of fabric and paper, in the production of varnish and pigments, and in medicine. Oil extracted in the Northern Caspian has a high paraffin content.

Parthia, Parthian Empire – the ancient state that appeared about 250 B.C.E. to the south and southeast of the Caspian Sea as a result of ebbing power of the nomadic tribe of Parni (Dahae). It existed until the third century C.E. Its first king was Arsaces, who established the Arsacid dynasty.

Patrol Boat (from French *patrouiller*, meaning “going on guard”) – a small naval vessel generally designed for coastal defense duties in the protected region of a water basin. In the fishery fleet, this is an inspection vessel controlling observance of the national fishery rules as well as international agreements within the economic (fishery) zone of a state by inspecting vessels.

Pelican – one of the most amusing and easily recognizable birds in the world. White P. that can be found in the Kura delta and in the Kyzylagach nature reserve has a distinctive pouch under the beak used as an excellent fishnet. P. catches fish by expanding the throat pouch. Quite often the catch is too large for the bird to eat it at once. The fully expanded pouch may contain up to 13 l of water. Young birds can easily swallow fish weighing 800–1,200 g. Fully grown P. eat fish weighing 2.5–3 kg and fish fries. Young birds acquire their adult feathers in the third year of life. They are good hunters. Flying over the water surface and seeing the fish, P. darts down in a spiral to the fish from a height of 3–20 m. Its wings are half-bent over the back and it curves the neck and draws in the head so that it is practically lying on the back. Falling down at a great speed, it hits the water surface with the front part of its body; the splash immediately hides its body. The impact against the water can be heard from a kilometer or more, but the well-developed subcutaneous pneumatic layer in the breast protects the bird from injury. As for the fish, it is deafened by

such “bombing,” and P. easily catches it in its beak and shoots out to the surface “like a cork.”



Pelican (http://www.povodok.ru/pics/art51/art5068_0.jpg)

Pelican Island – see *Pirsagatsky Stone Ridges*

Persia – see *Islamic Republic of Iran*

Persian Campaign of 1722–1723 – an advance of Russian troops and fleet led by Peter I to the Caspian holdings of Persia to ensure the interests of Russian merchants on the Caspian Sea and to prevent Turkish annexations in the Trans-Caucasus. The vessels of the “young” Caspian fleet also took part in this campaign. As a result, Derbent, Baku, Gilan, Mazandaran and Astrabad – the latter two provinces were not occupied by Russia – were seized. The success of the Russian troops and intrusion of the Turkish army into Trans-Caucasus urged Persia to sign the Petersburg Treaty of 1723.

Persian Campaign of 1796 – a march of Russian troops to the Caspian provinces of Persia in response to the incursion in 1795 of Persian troops into Georgia. In December 1796, after Emperor Pavel I came on the throne and due to the changed policy of Russia, troops were called back from the Trans-Caucasus.

Persian Campaign of Stepan Razin – initiated in March 1668, the Cossack fleet comprised 24 boats sailing along the western coast of the Caspian Sea to the Terek mouth where the troops of chieftain Sergey Krivoy joined S. Razin. From here, the Cossacks moved to Derbent, Baku and further on to the south. Having spent winter

on the MianKaleh Peninsula, they raided the eastern coast of the Caspian before retreating to Svinoy Island near the Kura mouth, where they defeated a Persian-Kumyk united fleet numbering 70 vessels and seized 33 canons.

Persian Sea – see *Caspian Sea, Names*

Persian (Kura River) Sturgeon (*Acipenser gueldenstaedti persicus Biridin*) – found in all zones of the Caspian Sea., though the bulk of its stock lives near the southern and southeastern shores. For spawning, it enters the Kura River, Sefid Rud River, and other rivers of the Iranian shore. It also enters the Volga and the Ural. P.S. is a bit larger than the Russian S.: length of females in the Kura River is from 105 to 224 cm, while males are from 88 to 228 cm. Along with large fishes, many immature individuals ranging in length from 40 to 174 cm, but largely from 70 to 120 cm, also live in the sea. P.S. grows faster than the Volga S. The average length of 15-year old females is 132 cm and of males is 122 cm. P.S. spawns in the same grounds where other sturgeons do: on the Kura from the tail run of Varvarinskaya Dam to Pirazy Village, and on the Araks downstream (10 km) of Bagramtashinskaya Dam. Spawning is observed in May and June, but sometimes it continues longer, until August and even September. Apparently changes in the spawning periods are due to the considerable reduction of mature sturgeon populations and shrinking of its spawning zone. On the Volga, P.S. spawns in summer, while in the Ural River spawning takes place in June and July. P.S. feeding is almost the same as that of the Russian sturgeon. In the downstream reaches of the Kura River and in the pre-mouth space of that river, the young of the current year feed on small crustaceans and larvae of Chironomidae. In the coastal waters of Azerbaijan (Yalama), mature individuals, besides bottom-dwelling small crustaceans, feed on clam worms and fishes (atherina, kilka, herring, and gobies). P.S. is far lower than Russian sturgeon in terms of population. At the end of the 1970s, its yields on the Kura River varied between 0.9 and 2.2 thou quintals. This should be combined with P.S. yield by the Iranian fishermen near the Iranian shores. P.S. is artificially fish-farmed.

Persian Treaty of 1723 – see *Petersburg Treaty of 1723*

Persians (self-name “Irani”) – the dominating ethnicity in Iran (about 50% of the country’s population), numbering 45.5 million (2009). They also live in Iraq, Saudi Arabia, Afghanistan, Pakistan, Kuwait, Oman, and other countries. The first mention of the Indo-European tribes on Iranian territory was of the Midyans and kin Persians (ninth century B.C.E.). Not only Iranian tribes, but Arabs, Turks and Mongols also took part in formation of P. The Persian language (Farsi) belongs to the southwestern subgroup of the Iranian group of the Indo-European languages. At the beginning of the sixteenth century, Shiite Islam became the official religion.

Peschanyi Island (sandy island) – located 4 km to the southeast of the Sultan Cape in Baku Bay, Azerbaijan Republic. F.I. Soimonov called this island “Pesoshny.” The island stretches for 3 km, and its width is 450 m. It is composed of sand and shells. A bar 1 km from the shore runs westward from the end of the island’s overwater sand bar.

Peshny Islands (from *peshnya*, a pick used by the Urals Cossacks in winter for hunting seals on these islands) – a group of islands, including Greater Peshny, Lesser Peshny, Egorycheva Shalyga, and Southerwestern Shalyga, extending in the south-eastern direction from the Ural River mouth to the south of Atyrau. Their greatest width is no more than 2 or 3 km, and they were mapped by N.L. Puschin. They were formed as a result of merging of several levees and acquired a circular shape. As a result of the water level rise in the Caspian Sea, their area has decreased significantly.

Peter I, The Great (1672–1725) – Russian Tsar (from 1682 to 1696 he ruled the country together with his brother Ivan); then from 1721, he was the Russian Emperor. He created the regular Russian army and Navy. In 1717, he became the honorable member of the Paris Academy of Sciences. He was energetically engaged in reforming the economics, statehood, culture, and military sphere, and he pursued an active foreign policy. The lifework of Peter I was to strengthen the might of Russia and improve its standing in the world.

From his young years, he was most interested in military matters, particularly naval affairs. Between 1688 and 1693, P. I learned to build ships on Pereyaslavl Lake under the guidance of the Dutch master, F. Tommerman and Russian master, R. Kravtsov. In 1696, the Russian army and fleet captured fortress Azov in the Don’s mouth. To continue the war with Turkey, which had seized control of the Azov and Black Seas, Peter I promptly began building a large navy. In 1697–1698, he studied shipbuilding in Amsterdam, and under the name of Peter Mikhailov, he worked as carpenter in shipyards. He also studied the theory of shipbuilding in England. On his return to Russia, he supervised the construction of the navy and some sea fortresses such as Kronshlot (Kronstadt) on Kotlin Island (1704) that played a key role in the defense of Petersburg from the sea. He also did much in building the merchant fleet and in developing seafaring in Russia.

He reformed the state apparatus and established a number of collegiums, including Admiralteistv-kollegia. About 200 metallurgical plants on the Ural that were constructed during Peter’s rule made Russia the world’s top supplier of pig iron and satisfied the needs of industry, navy, and army. P. I also founded textile factories to manufacture canvas and initiated the construction of several shipbuilding yards. In 1696, Russia’s first military ship was constructed at the Voronezh shipbuilding yard. This was the galley “Principium.” At the Syassky shipbuilding yard, which opened in 1702, were constructed 2 first frigates and on the Admiralteisky shipyard in Petersburg, Russia’s first battleships of the Baltic fleet, the 54-cannon “Poltava” (1712), the 64-cannon “Ingermanland” (1715), the 90-cannon “Lesnoye” (1718), and others were built. From 1705 to 1725, the Admiralteisky shipyard on the Neva River built 25 battleships, 4 frigates, and other vessels. Ships were also constructed at the Galernaya shipyard in Petersburg, the Olonets and Arkhangelsk shipyards, the Don shipyards (1723–1725) and others.

Many ships were designed, built and tested with P. I.’s personal participation. He issued decrees on construction of such canals as Vyshnevolotsky connecting the Volga with the Baltic Sea (1703–1709) and Ladozhsky (1732). An attempt was made

to construct a canal linking the Volga and the Don (1st project – linking Ilovli and Kamyshinki rivers, the 2nd project – construction of the Ivanovsky canal via the Ivanovsky Lake), but neither projects was realized. P. I took part in development of the Military Charter (1716), the Maritime Charter (1720), and Maritime Regulations (1722) and also gave some instructions on naval ship sailing. He himself was an excellent shipbuilder, mastered several crafts, and knew navigation and sea practice well.

He was an innovator and developed the theoretical foundations of the military and naval arts. To train naval personnel, he opened the School of Mathematical and Navigation Sciences in Moscow (1701) and the Maritime Academy in Petersburg (1715). He was the founder of the Petersburg Academy that opened in 1724 and played an outstanding role in development of Russian shipping, geography, and others. He also organized several geographical expeditions for study of the northern and eastern seas (expeditions to Kamchatka). During his rule, the Russian army and navy won a number of very important victories, including the battle at Poltava (1709) and sea battles at Gangut (1714), Grengam (1720), and others. Under the Nystad Peace Treaty of 1721, Russia acquired Ingria, Estonia, Livonia, parts of Karelia and other territories. During the Persian campaigns of 1722–1723, he joined the western and southern coasts of the Caspian Sea to Russia. All of these victorious campaigns facilitated improvement of Russia's status in the world.

Peter I died on January 28, 1725 after getting a cold during the rescue of the crew of a vessel that had sunk in the Gulf of Finland.



Peter I, the Great
(http://www.everleaf.com/chasewinfield/images/21_2a.jpg)

Petersburg Treaty (Persian Treaty) of 1723 – signed between Russia and Persia on September 12 after the Persian Campaign (1722–1723) of Peter I. Russia received all lands not only on the western but also on the southern coast of the Caspian Sea as far as Astrabad. Russia promised Persia military support in its military actions against Turkey. The treaty was not ratified by Persia.

Petrochemical Plant – plant (or petrochemical processes on an oil refinery), where intermediate materials are produced for use in other production processes or as end products for petrochemistry.

Petrovsk-Port – the name of Makhachkala until 1922.

“Petrovsky Beacon” – constructed in 1852 on the Andji-Arka hill, it is the present location of Makhachkala lighthouse.

Phytogenic Shores – shores formed as a result of life activities of plant organisms.

Piedmont Island – one of the Tyuleny islands, it is located at an inlet into the Mangyshlak Bay and differs from others because it extends eastward instead of westward. Its surface is composed of sand and shells, and the height of its hillocks is no more than 1.5 m high.

Pier Offshore Drilling Method – first applied in 1947 for development of offshore oilfields in Azerbaijan. The oil drilling pier represents a light bridge resting upon oil pipes rising 5–7 m over the sea surface. Such piers link the drilling platforms with each other and with the shore. Automobile roads and narrow-gage railroads may be constructed on them, making it much easier to construct infrastructure for oil production. It also became possible to construct camps for workers on such piers. This method enabled drilling without using special sea transport, which improved cost effectiveness of offshore drilling and increased its volumes.

Pirallahi – see *Artyom Island*

Pirsagatsky Bay – located between ranges of underwater and overwater stones and stony islands stretching 56 km to the south of Pirsagat Cape, Azerbaijan.

Pirsagatsky Stone Ridges – located near the western coast of the Azerbaijan Republic in the Caspian Sea, they are stony ridges stretching for 4 miles to the southeast of the southern shore of Pirsagat Cape. The northeastern range is underwater, while the southwestern rises above the water. It consists of two islands and several islets surrounded by underwater stones, the southeastern-most of which is Pelicany Island. To the west of the ranges the shallow areas (at the low sea level) are extending.

Pirshaga – a maritime climatic resort in the Azerbaijan Republic; an urban-type settlement 35 km northward of Baku and 10 km westward of the resort Bilgyakh. It is one of the Apsheron Group of resorts and is located on the northern coast of the Apsheron Peninsula of the Caspian Sea. The mild climate, warm sea and sandy beaches create conditions for climatic and thalassic therapy.

Pit – a deep, wide, and long deepening in the water body bottom (in the Volga lower reaches) where catfish, common carp, bream, pike perch, and sturgeons hibernate.

Plan of Action on Protection of the Wetlands in the Volga Delta and Volga-Akhtuba Floodplain – prepared in 1991 with support of the World Wildlife Fund (WWF) and International Waterfowl Research Bureau (IWRB). This Plan was targeted to stop destruction of the ecosystems in the Lower Volga and Northern Caspian, facilitating their restoration and ensuring their reasonable management and protection. The principal directions of this Plan are the following: reduced demand for resources, extension of the population's awareness about environmental problems, development of a network of specially protected territories, and protection of biodiversity of wetlands.

Plankton – an assembly of the organisms passively drifting in water (algae, protozoa, some crustaceans, mollusks and others) incapable of independently swimming for considerable distances. There are distinguished between phytoplankton and zooplankton, lacustrine P. – limnoplankton and river P. – potamoplankton.

Plavni (marshy banks) – the Volga mouth overgrown with reed and projecting far into the sea.

Pobochina – small shoals located on the sides of dangerous shallows in the Caspian Sea.

Pollution Spots – a part of the water space where the pollution level exceeds the maximum admissible concentrations. P.S. having coloring different from other water mass or changing water transparency due to a high content of suspended matter that may be revealed visually (various pigments, oil and oil product films, clay muds, wastewaters). P.S. not changing the water coloring may be detected only after special measurements (radioactive pollution, salts of heavy metals, inorganic and organic compounds). Depending on the specific weight of pollutants and their solubility in sea water P.S. may be surface and subsurface. P.S. are constantly in motion. We may distinguish 2 stages of such motion – spreading and drifting. In calm waters P.S. spread due to potential energy of the pollutant mass, their ability to dissolve in water or spread over its surface, a level of natural sea turbulence and also the action of surface tension forces of fluids. At this stage the initial sizes of P.S. are determined. Drifting of surface P.S. is dependent on the action of currents, wind and waves. Subsurface P.S. depends on the direction and velocity of currents in those water layers where the spot is spreading (in this case such factors as wind and waves are of secondary significance). The most widespread and best studied kinds of surface P.S. are oil spills. It was found that the direction of their movement does not correspond to the resultant of vectors of current velocities, wind drift and wave flow. The wind drift velocity is 2–4% of the wind speed. Due to the Coriolis Effect, the direction of P.S. movement deviates up to 20° from the wind direction. The velocity of P.S. movement due to the wave action is higher than that of advection by current.

Poloi – formed during flooding periods when water from numerous arms overflow the banks and inundate low-lying territories; banks and meadows inundated with spring flood waters; shallow flood waters. In the Volga delta, P. becomes a nursery for fish fries.

Polrud – a river flowing into the Caspian Sea 7.5 km to the southeast of Roudsar in Gilan Province, Iran. During flooding, the flow of this mountain river becomes torrential. The riverbed is stony and the banks are cliffy. The mouth is obstructed by a bar, and a fishery operates in the river mouth.

“Pond of Sun” – assumed name for the Caspian Sea in Homer as the eastern part of the World Ocean binding the earth’s shield that later on during many centuries was still considered by some classical geographers as a bay of the Northern Ocean that deeply intruded southward.

Pool – a section of a river or canal upstream or downstream of a backup structure (dam, sluice). Water division pools are located on a water divide and formed by two or more backup structures.

Port-Ilyich – a city since 1971, it is located on the Caspian Sea coast opposite the tip of the Sara Peninsula, Azerbaijan. Its population is 12.1 thou people (2008). In the past the transitional point Prival was located here, and cargo traffic between Europe, Persia and India passed through this point. In the eighteenth century, the Prival roads were a Naval base for Peter I and later on the base of the Caspian Naval Fleet of the Russian Empire. It appeared in 1921 as a port and was the only convenient shelter from the surge of the sea on the whole southwestern coast. In May 1921, the construction of the first sea port was initiated near Sara Peninsula. Over 16 months, a sea canal about 1.5 km long and 5.5 m wide was excavated. Before this time on the Caspian coast from Baku to Anzali not a single sheltered harbor for large sea vessels could be found. On October 5, 1922, the new port called P.I. (in honor of V.I. Lenin) was opened. From 1940 it lost its significance. It has an artificial harbor and a berth for fishing boats and ship-repair workshops. The Sarinsky Canal, which is about 6 km long and 50 m wide, runs from the outer roads to the harbor. There are also railway stations and a fishery plant. In 1999 P.I. was renamed in Liman city.

Port Bail – an artificial or natural recess in a coastline, the perimeter of which is used to increase the length of the mooring front of the port. Many Caspian ports have P.B.

Port Facilities – structures ensuring safe and convenient movement of vessels to and from a port. P.F. include quays, piers, breakwalls, docks and other features.

Port Olya – see *Olya*

Port Site – area occupied by a port within the boundaries indicated in the land register or under the master plan. Sited on P.S. are cargo-handling machines and equipment, warehouses, administrative and service buildings, repair shops, utility facilities as well as access and ports’ internal railway tracks and motor roads.

Port Water Area – includes the sorting, marshalling, and trans-shipment roads and areas enabling movement. Ships maneuvering and berthing.

Ports and Shipping Organization – primary marine organization of Iran. In 1914, the Department “Southern Customs Division” was established in Bushehr Seaport. The division was to monitor the Iranian shore and seaports. On February 6, 1927, the Russian Government handed over control and management of Anzali Port to Persia. In 1928, after the construction of the Tehran-Khorramshahr highway, sea trade began to grow. On February 4, 1928, the “General Directorate of Ports” was set up in Tehran, where all management of the ports was focused. At the same time, the new port Nowshahr was built and the anchorage at Khorramshahr Port was enlarged. In January of 1938, “Port Regulations” were approved; these had been prepared and recommended by the Ministry of Highways. On August 26, 1946, under the decree of the Council of Ministers, it was decided to channel all revenue from the operation of port facilities to the development of ports. In 1949, the General Directorate of Ports was replaced by the General Agency for Ports and Shipping which in 1959 was transferred from the Ministry of Highways and Transport to the Ministry of Customs and Monopolies. In 1960, the Agency changed its name to “Ports and Shipping Organization,” meaning that its functions and responsibilities increased. In 1966, P.S.O., together with its personnel, budget, and property, was separated from The Ministry of Economy and Ministry of Finance. In 1969, P.S.O. was granted an independent status.

Possible Reserves – reserves of hydrocarbon materials that, on the strength of available geological data, may be recovered with a fairly high degree of probability.

Pre-Caspian, Caspian Provinces – collective name of the Gilan, Mazandaran, and Gorgan provinces in Iran. The people in Iran also call them Shomal (Northern Iran), meaning “north” or “northern provinces.” Their area is 60,500 km² or 0.04% of the country’s total territory. The coastline is 700 km long. The width of the coastal plain varies from 2 to 100 km. The population in the coastal plain numbers 6 million people. This is the most densely populated territory of the country. Here 12 cities (45% of the population) and 6,760 villages (55% of the population) are found. Their main occupation of the people is agriculture (rice and citrus growing), fishing, and black caviar production. This zone has good potential for recreational development and tourism.

Pre-Kura Lowland, Plain – located to the south of Cape Amet between the mountain systems of the Greater and Lesser Caucasus. It stretches along the Kura River. Its northern coastal border, Cape Pirsagat, is a continuation of the Kura-Araks Lowland. This is a depositional plain with the deposits forming flat debris cones, often with merging edges that impart specific waviness to the relief. The climate is arid and subtropical. Precipitation is from 200 to 400 mm/year. The summer is hot, with a mean temperature in July higher than 24°C. The winter is mild with a mean January temperature of 0°C. Soils are the gray, gray-brown typical of dry subtropical steppes. The vegetation is semi-desert.

Preserved Area – an area of land or water surface in which natural features of special scientific or cultural value are protected from exploitation. In a PA, whose size and boundaries are determined by the appropriate normative and legal acts, restrictions are provided for any economic activity that disturbs the natural complexes or threatens the conservation thereof. An example is the PA in the northern part of the Caspian Sea.

Preserved Area in the Northern Part of the Caspian Sea – PA of the RSFSR introduced by Decree of the RSFSR Council of Ministers and dated 31.10.1975 to conserve the Caspian Basin fish resources, but still admitting the development of fisheries and water transport in this area in the future. This PA comprises the water area of the Caspian's northwestern part, and is limited in the east by a straight line passing from the point on the shore at the termination of the RF land frontier with the Kazakh SSR to a point with coordinates 44° 12'N and 49° 24'E, and in the south by a straight line passing from the point with the aforesaid coordinates to the Sulak River mouth. The eastern part is the Volga delta within the RSFSR from the dividing dam of the water divider to the frontier with the Kazakh SSR, and the shoreline along the boundaries of the PA along the seacoast (including Agrakhan Bay) with an elevation of –28 m marked in situ by special signs and notices. It is prohibited in the PA to dump into the sea, rivers, and other water bodies untreated waste waters of all kinds, wastes and refuse; to carry out geological exploration and seismic works; or to drill or operate oil and gas wells.

The Kazakh SSR PA was introduced by the Decree of the Kazakhstan Government dated 30.04.1974. In 1978, Kazakhstan included in its PA the water area and flood plain of the Ural River (Kazakhstan Government Decree dated 13.07.1978). Both PAs still exist; however, Kazakhstan allowed exploration and recovery of mineral resources in its PA in 1993. The Russian Federation, too, in 1998 allowed geological exploration and recovery in its PA. With the opening of these areas for exploration, companies had to sign “special environmental and fisheries requirements to comply with when making geological exploration and recovery of hydrocarbon materials in the northern part of the Caspian Sea.”

Probe – (1) a rod turned off on sides that is used in autumn to catch “probing” shoals in shallow areas of the Northern Caspian; (2) a device in the form of a narrow and long metal fillet to sample pressed caviar to determine its quality and grade.

Proletarsky Island – one of the four islands in the water area of the Astrakhan port near the left bank of the Volga River opposite Zayachyi Island. Between P.I. and the bank is the Zolotoy pool.

Proran – a narrow bay or lagoon protruding deep into land; a channel, strait; “strait between two neighboring bars or tidal islands” in the Northern Caspian; an lyman in a river mouth; a “narrow channel”, “strait between low-lying islands” in the lower Volga; “a strait between river arms.” The Mechetny Proran Bay in the south of the Astrakhan Region on the border with Kalmykia.

Protocol of Bilateral Agreement of 1998 on Delineation of the Northern Caspian Sea Bottom for Exercise of Sovereign Rights in Resource Use – signed on May 13, 2002 in Moscow by Presidents of Russia and Kazakhstan. This document fixed the agreed approaches to determination of coordinates of the median modified line and also jurisdiction and principles of development of oil structures found in the area of the median modified line. As a result of political compromise, Kazakhstan is assigned jurisdiction over the Kurmangazy structure, while the Khvalynsky oilfield and Central structure were left under Russian jurisdiction. At the same time Russia and Kazakhstan have arranged about development of the “border” fields on a par conditions balancing the interests of both countries.

Proven Reserves – the quantity of hydrocarbon materials that, based on the conclusions of qualified specialists as of the date of estimation, can be recovered using available technical equipment and under existing economic conditions with confidence.

Pulled-In Fish – still alive but weakened fish in tackle or fishing net at sea or in the opening.

Puschin Nil Lvovich (1837–1891) – after graduation from the Sea Corps and Officer Classes in 1854–1874, every year he took part in hydrographic expeditions to the Caspian Sea headed by N.A. Ivashintsev, and in 1871–1874 he himself headed such expeditions. In 1874 Russian Geographic Society awarded P. by F.P. Litke Gold Medal for magnetic observations in the Caspian Sea. From 1875 to 1882 he headed the surveys of the Baltic Sea. In 1882 he was appointed the Vice-Director of the Hydrographic Department. In 1888–1891 in the rank of General Minister he headed the Chief Hydrographic Department. As a result of his works the first Russian sailing directions for the Caspian Sea were prepared and published in 1878. He marked on the map a chain of the Peshny Islands. A shoal bank in the Caspian Sea and an Island near Novaya Zemlya in the Barents Sea were named in his honor.

Puschin Shoal Bank – located to the southeast of Makhachkala near the western coast of the Caspian Sea. It was described in 1859 and named in honor of N.L. Puschin, a researcher of the Caspian Sea.

R

RA – see *Volga*

Ragozin Viktor Ivanovich (1833–1901) – Russian entrepreneur, process engineer, researcher of Russian oil industry. Graduated in 1853 from the Department of Physics and Mathematics of St. Petersburg University, but stayed away from scientific research. Instead, he joined the Shipping Company “Volga,” traveling the entire river in a simple rowing boat and studying its hydrology and ethnography thoroughly. R. published a comprehensive album titled “The Volga.” In Nizhny Novgorod, he registered the Partnership “Caspii” for the building of bulk-oil schooners.

He devoted all his life to oil and its refining process. In 1875, R. built a lube oils plant near Balakhna, then another one in Konstantinovo Village in the vicinity of Yaroslavl city. In 1880, R.’s firm was authorized to mark its products with the Russian state emblem. The St. Petersburg Institute of Technology awarded R. *Honoris causa* – the title of a process engineer. Ragozin-made lube oils were valued highly abroad, which was proved by the gold medals won at the exhibitions in France and Belgium. The plants of the Nobel Bros., P.I. Gubonin and other entrepreneurs used Ragozin’s procedure. In 1884, R.’s book “Oil and Oil Industry” was published.

Ramsar – small health-resort town on the Caspian seashore in Mazandaran Province, almost on the border with Gilan Province, Iran. Its population is 34.5 thou people (2006). One of the most picturesque sites on the shore, where the mountains rise almost directly out of the Caspian Sea. The last palace of the Shah was built here. The Circum-Caspian highway passes through the town. The shore is covered with tea and tobacco plantations and orange and lemon orchards. R. is often chosen as the venue of international meetings (see Ramsar Convention).

Ramsar Convention – see *Convention on Wetlands of International Importance, Especially Waterfowls Habitat*

Rapa – concentrated brine (natural tuzluk) in salt lakes or in liquid containers; salt coming out on salted fish; water saturated with salt.

Rasht – the center of Gilan Province with a population of 560 thou people (2005). It is located at a height of 7 m below the Caspian Sea level 15 km from Anzali Bay

with which it is connected by the Seyhan-Rud River. R. grew to become a city in the fourteenth century and soon emerged as the main city of Gilan. Throughout its history, the city was conquered by the Russians several times. In 1668, it was sacked by the Cossacks of Stepan Razin, who previously had destroyed the Persian fleet on the Caspian Sea. During WWI, the city was again occupied by the Russians. It is a junction of several roads, and an important transshipment terminal for foreign trade traffic with Russia and Azerbaijan via Anzali Port on the Caspian Sea. It has also been a center of silkworm husbandry since the fourteenth century. The following industries are at an advanced stage of development: textiles, jute, cotton ginning and rice-hulling, soap-making, silicate industry, leather goods fabrication, tobacco industry, knitting trade and others. Industrial arts include wood and metal carving and fine woodworking. It is a center for rice trading.

Rasht Treaty – treaty between Russia and Persia signed on January 21, 1732 in Rasht City. The treaty on demarcation and transfer of certain territories to provide for the freedom of trade and navigation on the Caspian Sea and on the Araks and Kura rivers. Russia returned Gilan, Mazandaran, Astrabad, Derbent and Baku to Persia and withdrew its troops from those locations. Consular relations were established.

Raskat – shallow-water area overgrown with reeds and cattails where the Volga falls into the Caspian Sea.

Razin Stepan Timofeevich (circa 1630–1671) – Don Cossack leader of the 1670–1671 uprising. In 1662–1663, he was the Don chieftain who fought the Crimean Tatars and Turks. In 1667, together with Cossacks, R. traveled to the Volga and Yaik, and in 1668–1669 traveled over the Caspian Sea to Persia. In the spring of 1670, R. headed the anti-government mutiny of the Cossacks and peasants, but was handed over by a Cossack sergeant to the tsarist government. He was executed in Moscow.



Razin S.T.
(http://history.sgu.ru/img/x1-SR.jpg?q=rus_hist/img/x1-SR.jpg)

Red Banner Caspian Military Flotilla – see *Caspian Military Flotilla*

Red Fish, Red – fish of sturgeon species: beluga, sturgeon, stellate sturgeon, and barbell sturgeon.

Refraction – change of direction of a propagating wave when passing from one medium to another that has a different density and index of refraction. Terrestrial R. – bending of the paths of rays propagating from terrestrial objects to the observer’s eye in different layers of atmosphere surrounding the earth. As a result of R., for example, lighthouses may be seen earlier than expected. The value of terrestrial R. depends on the difference in temperature and pressure of the air around the observer and the object. R. on the Caspian Sea usually occurs in summer. It is observed more often near the eastern shore, especially in the vicinity of Esenguli settlement, Kara-Bogaz-Gol Bay and Turkmen Bay as well as in the northern part of the sea.

Regression – (from Lat. “*regressio*” – “*reverse movement, retreat*”) slow retreat of the sea from the shores due to rising dryland, lowering of the oceanic bottom, or reduction of water volume in the oceanic basin (e.g. during the glacial periods). There were multiple R. throughout the geologic history, normally coinciding with the periods of orogenesis. As far as the Caspian Sea is concerned, the sea level during R. was close to from –50 to –100 m abs. level.

Regulations on Caspian-Volga Seal Hunting – elaborated in 1902 by the Committee of Caspian Fishing and Seal Hunting in cooperation with the Department for Caspian Fishing and Seal Hunting, the Association of Astrakhan Fishery Managers, the Astrakhan Cossacks and private persons. Many provisions of these regulations were enforced in 1903. After 1904, the regulations controlled the distances among fishing grounds, the quantity of fishing tools there, the sizes of meshes in nets, the weight of hooked nets that were not regulated by the Code of Caspian Fishing and Seal Hunting. The regulations were not enforced after 1917.

“Renaissance of the Volga” – federal purpose-oriented program FPOP: “Environmental Enhancement on the Volga River and its Tributaries, Rejuvenation of the Volga Basin Natural Complexes, and Prevention of their Degradation” has been developed pursuant to the 1994 Decree of the Russian Federation Government. The program suggests bringing ecological, economic, scientific-and-technical, and institutional measures aimed at socioeconomic development and environmental enhancement of the Volga Basin together in a single package. The Program sets forth: general integrated course of phased development and implementation of economic and institutional measures and preparation of a package of legal and normative documents making it possible ultimately to attain the main strategic goal. From 1992 to 1994, the first component part of the program was elaborated: FPOP concept. The concept is aimed at outing into reality of the basic provisions of the state policy of sustainable development and is regarded as a vehicle to coordinate the activity of the numerous participants in the process of Volga renaissance and as a means of resolving major problems through attracting the resources of various

investors, growth of business activity of entrepreneurs, etc. The ultimate goal of the program is to provide the necessary conditions for finding a way out of the current crisis of the huge Grand Volga region that comprises 8 republics and 28 regions of Russia. The Program is set out in 3 books entitled “Renaissance of the Volga – a Step Towards Russia’s Salvation” (1996, 1997, 1999).

Republic of Kalmykia – one of the RF constituent entities. The Russian name of the republic derives from the ethnic name of its indigenous population, the “Kalmyks”. Its area is 76.1 thou km², and its population is 284 thou people (2009), out of which the urban population 44.5% and the rural population is 55.5%. It consists of Kalmyks (53.3%), Russians (33.6%), Dargins (2.5%), Chechens (2%), Kazakhs (1.7%) and others, most of Kalmyks are Buddhist. The population density is one of the lowest in Russia at 3.8 persons/km². Agricultural lands equal 59.74 thou km², and the forested area is 0.3 thou km². The capital city is Elista. The ancestors of Kalmyks are the Oirats, who lived between the Sayan Mountains and Baikal Lake. They came to Kalmykia in the sixteenth century. To use L.N. Gumilev’s expression, the Kalmyks are “truly a steppe ethnosc,” who were a stern race of horsemen and warriors. From the second half of the seventeenth century until 1771 it was part of the Kalmykian Khanate. During the seventeenth to eighteenth centuries, all uluses (nomad camps) acceded to the Russian Empire. In February–March of 1918, Soviet power was established. In November of 1920, the Kalmykian AO as part of the RSFSR came into being (until 1927, its center was Astrakhan). In October of 1935, it was transformed into the Kalmykian ASSR. During World War II, K. was occupied by the German troops from December of 1942 until January of 1943. In 1943, the autonomy of Kalmyks was abolished, and the population being deported. In January of 1957, the Kalmykian Autonomous Region was reestablished (from July of 1958, the Kalmykian ASSR). In October of 1990 the Supreme Council of the Republic signed the Declaration on state sovereignty of Kalmykia. Since February 1992 Republic was called “Republic of Kalmykia - Khalm Tangch”. In 1998 it was renamed back to Republic of Kalmykia. Since 2000, R.K. has been part of the South Federal District.

The administrative division of the republic consists of 13 districts, 3 cities, and 114 villages. Major cities are Elista, Lagan, and Gorodovikovsk.

R.K. is situated in the south of European Russia, mostly in Circum-Caspian Lowland. By relief, it is divided into 3 parts: the Circum-Caspian Lowland in the east, which is subdivided into the Black Lands in the south and the Sarpin Lowland in the north; Ergeni rises in the northwest (under 218 m, Mt. Cholon-Khamur) with Salsk-Manych ridge (222 m high) offshooting from it; and the Kumo-Manych Depression (25 m in height at the water divide).

The climate is sharp continental, with mean temperatures in January of –5 to –8°C and in July of 23 to 26°C. The amount of precipitation is 170–200 mm/annum. The length of the vegetation period is 180–215 days. The agroclimatic conditions are by and large not suitable for arable farming, but are profitable for commercial sheep-breeding.

The southeastern part of R.K. is washed by the Caspian Sea. The rivers flowing toward the Manych Depression go dry in summer, while those flowing down from

Ergeni – the Elista, Yashkul, Sarpa and other rivers – are more plentiful; both end in blind mouths or form lakes. Prominent lakes are Sarpinskies (Prishib, Sarpa) in the north, Sostinskies in the south, and lakes in the central part of Kumo-Manych Depression include Manych-Gudilo and Tsagan-Khak. In the northern part, R.K. is covered with fescue-feather's grass mixed with steppe and semi-desert vegetation on light-chestnut soils in combination with solonetz soils. The southeastern part is largely composed of grass-sagebrush semi-desert vegetation. The hollows are overgrown with cane and wheat grass, and the meadows feature motley grasses. Encountered in Ergeni gullies are thickets of willow-tree, elm, and aspen.

Mineral resources include natural gas, oil, bischofite, table salt, mortar sands and clays. The best known fields are oil (Vysokovskoe, Mezhozernoe, Komsomolskoe, and Kanyshskoe); gas (Promyslovoe, Chubuskoe, Ermolinskoe, Mezhevoe, and Iki-Burulskoe); gas condensate (Tengutinskoe and Oleinikovskoe); clay (Bashantinskoe, Tsagan-Amanskoe, and Sarpinskoe); and table salt (Mozharskoe).

The agricultural sector is the backbone of the republic's economy. Development of agriculture is determined by water availability of the territory and rainfall during the year. The main hydrotechnical structures are Chograi and Arshan-Zelmen Storage Reservoirs; watering-irrigation systems are the Egorlynskaya, Olyakaiskaya, and Chernozemelskaya.

In the structure of commercial items of agriculture, livestock accounts for 70% and cultivation for 30%. Animal husbandry is dominated by thin-fleece sheep breeding. Preference is given to the Kalmyk breed, which is well-adapted to the conditions of range-based keeping of animals. The "marbled" meat of these sheep is distinguished by excellent gustatory properties. Merino sheep are divided into thin and semi-thin wool. A system of distant range livestock is maintained. The establishment of wool enterprises and meat-canning factories, with a complete wool processing cycle, is encouraged in the Republic. As for other branches of animal husbandry, cattle-raising and camel-breeding are also practiced on a large scale.

Oil production is the primary industry of R.K. Oil production equals 250–300 thou t/annum. This industry is represented by the regional company OJSC "Kalmneft." In the structure of industrial production, the food industry accounts for 21.8% of the total, and the power industry accounts for 31.9% (in 1993, 40.6% and 26.0%, respectively). The largest production unit of the food industry is the Circum-Caspian Integrated Fish-Processing Plant in Lagan City (processes herring, great sturgeon, stellate sturgeon, sturgeon, pike-perch, and roach; the factory processes smoked, sun-dried, and frozen fish as well as fish preserves). There are specialized fishing collective farms. Other food plants include butter-making (Yashalta, Bashanta, and Sadovoye) and a dairy plant (Elista). Production of building materials is arranged at brick-roofing-tile works (Elista, Sadovoye, and Bashanta), borrow areas of quarry stone and workstone, reed-fiber mat-making units.

R.K.'s economy is substantially related to the Caspian Sea. Major fishery-based production capacities are in Lagan District, where there is a low-density port at Lagan. To facilitate ships' exit to the open sea, in 1934, the canal "Lagan Shoal Bank" was built.

The territory of R.K. is crossed by the Kizlar-Astrakhan Railway (216 km within R.K.). Motor transport plays a key role in domestic cargo carriage (2.8 thou km of

paved motor roads), and regular runs connect Elista with the railway stations Divnoe and Astrakhan. There is an airport connecting Elista with Moscow. Navigation is developed on the Volga River and the Caspian Sea. Four gas pipelines are laid over the territory of R.K. as well as a segment of the CPC oil pipeline.

R.K. has excellent hunting areas for the only saiga antelope population in Europe as well as wolves, fox, wild boar, and water fowl. There are 3 state reserves of federal significance and 10 local reserves as well as the biosphere reserve “Chernye Zemli” (“Black Lands”) in R.K.

Republic of Kazakhstan, Kazakhstan – state situated in the Central Asia, in the very center of Eurasia. R.K. is bordered by the Caspian Sea on the west and by the Aral Sea on the south. It is bordered on the north and west with the Russian Federation, on the southwest by Turkmenistan, on the south by Uzbekistan, and Kyrgyzstan, and on the southeast and east by the People’s Republic of China. Its territory is 2,724.9 thou km². Its capital city is Astana. R.K. is the most urbanized of all Central Asian Republics. Its major cities are Alma-Ata (1.37 million people in 2009), Shymkent (736 thou people), Astana (684 thou people), Karaganda (457 thou people), Taraz (former Dzhambul, 380 thou people), Semipalatinsk (330 thou people), and Pavlodar (318 thou people). As far as the R.K. is divided into 14 regions and 3 municipal akimates (Astana, Alma-Ata, Leninsk), 160 districts, and 2,150 rural areas. The largest regions are Aktyubinsk, Alma-Ata, East-Kazakhstan, Karaganda, Kostanai. The total population is 16.2 million (2009), with nationalities including Kazakhs (63%), Russians (24%; in 1989 6.2 million Russians lived in R.K.; in 2009 their population had declined to 3.8 million), Uzbeks (2.9%), Ukrainians (2.1%), Uigurs (1.4%), Tatars (1.3%), German (1.1%), Belorussians, Koreans, and others. Economically active population of R.K. is 7.2 million people, out of which, 6.3 million are engaged in various branches of economy. The official language is Kazakh. Most religious believers are Sunni Muslims. The Russians adhere to the Russian Orthodox Church. Most Germans are adherents of Lutheran Protestantism. The monetary unit is the Tenge.

R.K. is part of the CIS. The Constitution of R.K. passed as a result of the referendum of 31.08.1995, and decrees a presidential form of government in combination with a permanent professional two-chamber (Senate and Majlis) parliament. R.K. is promulgated as a democratic, secular, unitary state. The head of state is a president who is in charge of the single system of the Republic’s executive branch. On 01.12.1991, Nursultan Nazarbaev was elected the President of R.K. for 5 years. Following the election of 29.04.1998, his term of office was extended. The supreme body of state power is the two-chamber parliament. The government is the Cabinet of Ministers. There are about 30 active parties and movements in R.K.

The surface of R.K. is extremely diverse. The low-lying plains give way to tablelands, hummocky topography, while in the east and southeast rise high mountain ranges. In the west of K. is the lowest location in the country, the Karagie Depression (132 m below the ocean level), and in the east are mountains capped by eternal snows and glaciers as high as 5,000 m. Most of R.K.’s surface is plains and

lowlands. A considerable area is occupied by the Circum-Caspian Lowland near the shores of the Caspian Sea. The lowland lies at the height of 28 m below the ocean level, rising up to 50–60 m farther to the north. In the northeast, the Circum-Caspian Lowland is limited by the Ural Mountains and Mugojars. To the east of Mugojars is the Turgai Plateau (250–300 m) which is succeeded by the Turan Lowland in the south that is occupied largely by the sands of the Kyzylkum and Circum-Aralkarakum Deserts. To the west of the Aral Sea rises Ustyurt Plateau (height under 300 m), ending in steep ledges – chinks – overlooking all sides. In the central part are the Kazakh hummocks that are the remains of an ancient mountain system and featuring the stand-alone mountain massifs Kyzylrai and Karkaraly. The southern part of the Kazakh hummocks give way to the extensive desert plateau Betpak-Dala (height 300–400 m), to the south of which is the large area occupied by the Muyunkum sands. In the east and southeast of R.K., along its southern border, stretch the southern chains of the Altai, the ranges Tarbagatai, Saur, Dzhungar Alatau, and the northern chains of the Tien Shan and Trans-Ili Alatau.

The climate is sharp continental and arid. The south has a tangible impact of the masses of continental tropical air encroaching from Iran and the Caspian Sea. The mean temperature of January is from -18°C in the north to -3°C in the south, while in July temperatures are 19 and $28-30^{\circ}\text{C}$, respectively. In the north (in summertime) up to 300 mm/annum precipitation falls, while in deserts – less than 100 mm, and in the mountains up to 1,600 mm falls. There are over 2700 glaciers (total area around 2,000 km²).

The rivers of R.K., except the Irtysh, belong to the basins of the Caspian and Aral Seas and Balkhash Lake. The Irtysh is part of the Arctic Ocean Basin. The main rivers are the Irtysh, Ural, Syrdarya, Emba, Turgai, Nura, and Sarysu. Many rivers dry up in summer. The rivers Ili, Karatal, Aksu and Lepsa flow into Balkhash Lake. There are 180 storage reservoirs built on the rivers, the major ones being Char-Darya, Bukhtarma, and Kapchagai; there is also the 478 km-long canal, Irtysh-Karaganda.

There are over 48 thousand lakes in R.K.; they are mostly deltaic and flood plain lakes. The largest of these are Balkhash, Zaisan, and Alakol. When the Aral Sea dried out and divided into three water bodies, the Small Aral Sea remained fully within the Republic.

The chernozem soils in the north of R.K. are succeeded southward by dark chestnut and chestnut. Most of these were ploughed up during the virgin lands development campaign of the 1950s. Farther to the south are brown and gray-brown soils. The extreme south features serozems, while the intermontane dry basins have chestnut soils.

The forb-gramineous and fescue-mat grassy steppes (most of these ploughed up) are succeeded by sagebrush-gramineous semi-desert and sagebrush-saltwort desert vegetation. In the foothills of the dry steppes and in the mountains of middle height are coniferous woods, while higher are subalpine and alpine meadows. The fauna is represented by numerous rodents, creepers and by some predators (fox, wolf, badger, and others). The semi-deserts and deserts feature aquiline-nosed saiga and Persian gazelle; of the birds are the great bastard, sociable plover, and curlew,

while among water fowl are ducks, geese, swans, cormorants, pelicans, and others. Encountered in the mountains is the Pamir argali, while in the Tien Shan are snow leopards.

In the Caspian Sea and in the Ural River, common fish are herring, roach, great sturgeon, sturgeon, and stellate sturgeon. In the Small Aral Sea are asp, bream, and common carp. Sealing is also widely practiced in the Caspian Sea.

There are 8 reserves in R.K.: Alma-Ata, Aksu-Dzhabagly, Barsakelmes, Naurzum and Kurgalji, Markakol, West-Altai, Ustyurt. Bayan-Aul Natural Park has been in existence since 1997.

R.K. exhibits great diversity and large reserves of mineral resources. Of the 105 elements of the Periodic Table of the Elements, the Republic's subsoil has proved to contain 99, reserves of 70 of which have been explored and over 60 have been used in production. In terms of explored reserves of lead, zink, and bismuth, R.K. ranks first among the CIS member-countries, and it is second in reserves of copper, molybdenum, bauxites, oil, phosphates and cadmium. Kazakhstan's subsoil on the Caspian shelf and adjoining dryland contains hydrocarbon raw materials of higher quality than all of the other CIS states. R.K. ranks 13th in the world by the volume of explored reserves of oil and gas, and 26th in terms of the rate of oil and gas production. At present, over 180 oil and gas fields have been explored in R.K., though only 60 of these have been developed. The known reserves of hydrocarbons equal 2.2 billion tons of oil, 0.7 billion tons of gas condensate, and 2.7 trillion cubic meter of gas. The potential resources of R.K. on dryland and the shelf are estimated at 12 billion tons of oil, 1.6 billion tons of gas condensate, and 5.9 trillion cubic meter of natural gas. The oil reserves that have been discovered are tough to recover because they contain asphalt-resinous-paraffinaceous components. There are large oil and gas fields, considerable fields of phosphorites, and fields of chrome and uranium ores. The north is rich in iron ores, gold, and coal; bauxites and table salt are also recovered there. There are also fields of titanic ores and asbestos. The eastern part is dominated by non-ferrous metal ores, of which the most important are complex ores, which, in most cases, are confined to the fields of Mining Altai. Deposits of iron and manganese ores and copper as well as Kazakhstan's largest field of coking coal (Karaganda Basin) are concentrated in the center of the country. The south features the CIS's largest phosphorite field, Karatau. Furthermore, there are enough raw materials in the country for the promotion of building materials industry.

The ancestral Kazakh settled in this area around the first century C.E. Sak tribes occupied a huge territory of the present-day Semirechye (area of seven rivers) and the Syrdarya Basin. During the sixth to twelfth centuries, various early feudal states uniting the Turk-language nomadic tribes succeeded one another in these areas. Early in the thirteenth century, the whole of Central Eurasia was part of the Mongolian state. In the fifteenth century, the White Horde, inhabited by Uzbek-Kazakh tribes, disintegrated, and the Kazakh Khanate, which was divided into three zhuzes, came into being. The discrepancy between the feudal superstructure and patriarchal basis did not permit the establishment of a strong state. Soon after the Kazakh Khanate was formed, a process of its fragmentation began, which peaked early in the eighteenth century, when in 1731 the Junior Zhuz, and in 1740, the Middle Zhuz acceded to Russia voluntarily. Roughly from that time, the period of

active penetration of Russian Cossacks began in the territory of contemporary R.K. Along with the growing influence of Yaik River Cossacks, there also emerge the so-called linear Cossacks who had settled within the area from Omsk to Orenburg along the chain of bitter lakes (“bitter line”). In 1819, the Tsarist Government abolished the Khan’s authority in both the zhuzes and introduced a new system of administrative management. By mid-nineteenth century, the entire territory of the Senior Zhuz was annexed to Russia. In 1867, “Provisional Regulation on Steppe Territories Government” was adopted. Alongside this, during the 1880s–1890s, the process of active involvement of the region in the system of the all-Russian economy began. The Tsarist Government took action towards large-scale resettlement of resident peasants from Russia, Ukraine, Belorussia, and other regions in the Kazakh steppes. On 26.08.1920, the Kyrgyz ASSR was established as part of the RSFSR, subsequently (19.04.1925) to be renamed the Kazakh ASSR. From 05.12.1936, R.K. becomes a union republic. During the 1930s, active industrial development began, and at the end of the 1950s, the campaign to develop virgin and fallow lands was launched. Between 1960 and 1965, on the basis of five northern regions (Kokchetav, Kostanai, Pavlodar, North-Kazakhstan, and Tselinograd), the Tselinnyi Territory was established. R.K. was thus transformed into one of the leading industrial and agricultural areas of the USSR.

On 25.10.1990, the Supreme Council of the Kazakh SSR adopted the Declaration on State Sovereignty. On 16.12.1991, the Supreme Council passed the Law “On State Independence of the Republic of Kazakhstan,” and on 25.05.1992, the Treaty on Friendship, Cooperation and Mutual Assistance between the Russian Federation and R.K. was signed. Diplomatic relations with Russia were established on 22.10.1992, and R.K. became a member of the CIS in 1991.

R.K. has been a member of the UN since 02.03.1992. It is also a member of ASDB, EBRD, IDB, OIC, OEC, SCO, ESCAP and other international organizations.

R.K. has a “transitional economy.” Following the collapse of the USSR and due to broken links and economic crises, many industries were at a standstill. At present, privatization in the country has been completed, advanced tax laws have been adopted, an up-to-date banking system has been established, and reforms have been implemented in agriculture, the housing-and-communal sector, and the social sphere. A multi-industry industrial production based on domestic resources was established in R.K. during the years of Soviet power. Heavy industry was dominant. The fuel-and-energy sector, metallurgy, and food industry remain crucial in the industrial pattern of the Republic.

The fuel-and-energy complex, based on reserves of coal, oil and natural gas, constitutes the backbone of Kazakhstan’s economy.

Oil has been produced in R.K. for over 100 years. Until recently, all explored oil fields in the country were on dryland: Tengiz-Korolevskoe, Kumkol, and others as well as the gas-condensate field of Karachaganak. After gaining independence, R.K. began to develop the Caspian Sea shelf. In 2000, the largest oil field, the East Kashagan, with reserves around 7 billion tons was discovered. Under the Agreement between Russia and the Republic of Kazakhstan on dividing the seabed in the northern part of the Caspian Sea with a view of exercising sovereign rights in the use of

the subsoil, the “Khyvalynskoe” and “Tsentralnoe” fields will be developed jointly on a fifty-fifty basis. By volume of oil reserves, R.K. ranks 5th in the world.

The coal industry is concentrated in the Karaganda and Ekibastuz Basins, yet coal production has been cut abruptly. Relative to CIS production volumes, the country produces: 40% of uranium, 97% of chrome, 70% of lead, 50% of zinc as well as significant volumes of other raw materials and precious metals, including gold. The electric power industry is based on the use of major GRES (state district power plants). Additionally, high-capacity hydroelectric power plants have been built on the Irtysh (Bukhtarminskaya, Ust-Kamenogorskaya, Shulbinskaya), and there are high-capacity thermal power plants in Ekibastuz, Karaganda, Garaz, and in the vicinity of Alma-Ata and Pavlodar.

Metallurgy plays a special role in the national economy. It accounts for 14% of industrial production and 30% of export. A major full-cycle integrated iron-and-steel works is operated at Temirtau, and there are ferroalloy plants at Aktyubinsk and Aksu (Pavlodar Region). Non-ferrous metallurgy is one of the key industries of Kazakhstan’s industrial production. There are two distinct major areas of non-ferrous metallurgy development: Central (copper) and Eastern (complex-ore based: lead, zinc, aluminum, copper, gold and other minerals). Major centers of non-ferrous metallurgy development are at Ust-Kamenogorsk, Leninogorsk, Balkhash, Zhezkazgan, and Shymkent; production of aluminum is at Pavlodar and of chrome compounds is at Aktyubinsk. The Circum-Caspian Mining and Concentration Complex processes uranium ore into concentrate and at the same time obtains a range of rare and rare-earth elements, master alloys, and alloys on their basis and simultaneously arranges allied production of phosphorous fertilizer. One of the largest plants making nuclear reactor fuel is in Ust-Kamenogorsk.

Oil refineries are at Atyrau, Pavlodar, and Aktau. Their combined volume of oil processing equals 11 million tons of oil. The only gas-processing plant is at Novy Uzen City. The chemical industry is represented by fertilizer production (phosphate fertilizer, salt of phosphorus, superphosphate), sulfuric acid, chemical fiber, plastics, etc. The major centers are Taraz, Kostanai, and Aktau.

Machine-building was organized during World War II with equipment relocated from the European part of the USSR. Of machine-building branches, the following are dominant: agricultural (Astana, Aktyubinsk), tractors (Pavlodar), electrical engineering (Alma-Ata, Petropavlovsk, Uralsk), mining equipment and transport (Karaganda, Alma-Ata, Ust-Kamenogorsk) and others.

Of light industry branches, the following are well-developed: leather goods, fur, cotton trade, footwear, manufacture. Food industry includes major meat-production plants (Semipalatinsk, Alma-Ata), sugar production (Taraz, Talykorgan), butter-making, cheese-making, flour mills (mainly in the regional centers of the Republic’s north), and others.

The ratio of agriculture in the structure of the agro-industrial complex is near 50%. There are two key branches in agriculture of R.K.: large-scale mechanized crop farming and stock-raising on the basis of distant pastures. Arable lands, mainly in the north of the Republic, occupy 18% of agricultural lands. Most virgin and fallow lands were developed early in the 1950s. Smaller arable areas are, for the most part, in the foothills of Altai, the Tien Shan, and in the river valleys. Sown

areas are in excess of 15 million hectares. The main branch of arable farming is grain husbandry. Over 11 million hectares are under grain production. Also cultivated are sunflower, millet, corn and paddy (in the Syrdarya River Valley). As far as cash crops are concerned, there are small areas under cotton in the south, while in the south-eastern regions there are sugar beet and tobacco. Gardens and vineyards are in the foothills. Cucurbit cultivation is at an advanced stage of development.

Rangelands account for 57% of the country's area. The primary branch of animal husbandry is sheep-raising (9.8 million heads), and above all, fine-fleece, semi-fine wool, and karakul sheep breeding. In the steppes, they raise cattle for meat, and dairy cattle husbandry is practiced on suburban farms. The cattle population is 4 million heads. Also practiced are horse-breeding, camel-breeding, and swine-breeding.

The main modes of transport are railways (95% of the country's freight turnover) and auto transport. The operating extent of railways is around 15,000 km and of auto roads is around 100,000 km. The largest oil pipelines are Omsk-Pavlodar-Shymkent and Aktau-Atyrau-Samara; gas pipelines are Zhanaozen-Makat-Saratov, Bukhara-Ural, and Tashkent-Alma-Ata. Major ports on the Caspian Sea are the refurbished Aktau and Atyrau, and navigable rivers are Irtysh, Ural, and Ili.

Airports in K.R. are at Astana, Alma-Ata, Karaganda, and Aktyubinsk. In Karaganda Region, in the vicinity of Leninsk City, is the Baikonur Cosmodrome, which Russia rents to launch spacecraft. The telecommunications system of R.K. is made available by the "Kaztelecom" company.

The country's economy is increasingly oriented to rapid development with the aid primarily of foreign investments, largely coming from the West, in extraction and processing industries. Export earnings from the sale of mineral raw materials and products of their processing are regarded as the main lever capable of riding the country out the crisis. This is manifest in the development projects of Tengiz and other oil-and-gas fields and in the active promotion of foreign economic cooperation with the US, European, and Asian states. R.K. has signed agreements with foreign oil companies for over USD 40 billion that will be invested in the oil-and-gas branch of economy during the next 40 years. The major investors are American company "Shevron", the French company "Elf Akiten," and others.

The main export items are oil and oil products (40% of export), ferrous and non-ferrous metals, and mineral commodities (including crude oil and fuels). A significant proportion of the structure of imports is that of plant and equipment, carrying equipment, fuel and energy resources as well as sugar, tea, etc. The main import suppliers are Germany, Austria, Morocco, Mongolia, and Turkey. Deliveries from Russia account for 82% of imports.

Tourism infrastructure is being upgraded. The Republic has such well-known health-resort areas as Medeo and Kokchetav. There are several dozen higher educational establishments in the Republic, including major ones like Kazakh State University in Alma-Ata, L. Gumilev Eurasian University in Astana, Turkestan International University, and Karaganda University. The Academy of Sciences of Kazakhstan was established in 1946. There are around 40 theaters. The Kazakhstan TV and Radio Broadcasting Company was also established (TV broadcasting in the Kazakh and Russian Languages). Radio programs are broadcast in the Kazakh, Russian, German, Korean, and Uigur Languages.



Republic of Kazakhstan (http://www.luko2.com/images/mapy/info_mapa_kazachstan.jpg)

Rial – monetary unit and national currency of the Islamic Republic of Iran. Banknotes of R. 100, 200, 500, 1,000, 2,000, 5,000, 10,000, 20,000, and 50,000 are now in circulation. After the death of Ruhollah Khomeini, his portraits were used on the obverse of 1,000 Rial banknote and greater. R. is subdivided into 100 dinar but, because of the very low current value of the R., no fraction of the R. is used in accounting. In 1993, a new coinage was introduced with smaller 1, 5, 10 and 50 R. coins and new 100 R. pieces. 250 R. coins were introduced in 1994. Coins currently in circulation are 50, 100, 250, 500 and 1000 R. The 5, 10, 50 and 100 R. are still legal tender but are not issued anymore

River – natural water course flowing over the earth surface within the channel formed by it. The sources of River feeding are atmospheric precipitation, snow,

glaciers, springs and ground water. R. are essentially charged by precipitation, the process for which is not uniform, which produces sharp variations of discharges and water levels in the R. Each R. has a distinguishable headwater and mouth. The combination of all R. flowing into the main R. forms a river system. R. flowing into the main R. directly are called first-order tributaries; R. flowing into the first-order tributaries are second-order tributaries, etc.

River Arm – part of river channel and divided into lades, the largest of which (most plentiful) is usually called the main R.A. In general, they are distinguish between navigable and non-navigable R.A. The lower reaches of major rivers flowing into the sea are, as a rule, divided into a multitude of arms that together form the delta.

River Basin – geographic area drained by a river and all of its tributaries. The area of one of the largest R.B. of the Caspian Sea – the Volga R. – equals 1,360 km², which is 62.2% of European Russia's and 8% of all Russia's territory.

River Flow Transfer – diversion of water from any water body located in any watershed basin and its delivery to a user via natural or artificial channels to cover a water deficit (or to make use of excessive water in other watershed basin). It is often called the territorial redistribution of a river flow.

River Lake – a river stretch from one meander to the other; a shoal covered with water.

River Sediments – matter transported by river water in a suspended state and settling in ac river channel. Formed as a result of catchment area being washed out by rain and snow-melt water and river channel scouring.

“Road to Arabs” – in this way the merchants called the Volga in the Middle Ages. This “road” was in no way inferior to the road “from Varangians to Greeks” along the Dnieper.

Roads (Dutch.) – part of the port water area designed for anchorage, maneuvering of vessels, or cargo handling; water area near the shore or at the port entrance, and convenient for vessel anchorage. Since 1992, Astrakhan Sea Port has been regarded part of the state territorial waters.

Rossyp – shoal in the Caspian Sea. Shoals on the Caspian have the following local names: *zaburunye* – shoal-ridge along the shore; *oseredok* – underwater shoal away from the shore; *pleshina* – exposed shoal; *shalyga* – long, naked sand shoal; *pobochina* – small shoals arranged on either side of a dangerous *rossyp*.

Rosy Posygel – crater lake of mud-volcano origin 6 km to the north of Khazar City, Turkmenistan. It is in the volcanic chimney of an ancient mud volcano. The lake is known for its pink tinged water.

(The) Rothschilds – (Germ. “*roth*” – “*red*”, “*das Schild*” – “*signboard*”, a derivative of the “House with a red signboard,” in which the family used to live), the

financial group in West Europe. The founder of the banking-house Amschel Mosezs Bauer (1744–1812), who changed the family name to Rothschild. His sons were Amschel Mayer (1773–1855), Solomon Mayer (1774–1855), Nathan Mayer (1777–1836), Calmann Mayer (1788–1855), and Jakob Mayer (1792–1868) – “The five Frankfurters”. For years, they lived close to one another: Frankfurt (Amschel), Vienne (Solomon), Manchester and London (Nathan), Paris (Jakob), and Naples (Calmann). This enabled them to remain abreast of the financial developments in the leading European countries and to make mutually beneficial decisions. The R. adhered to this principle: *Servare modum finemgue tenere – To know when to stop and never lose the goal from a view* - one of the main secrets of their strength.

R. were one of the major financial dynasties in the eighteenth century. In 1809, the firm “M.A. Rothschild and Sons” was founded, which was the cornerstone of the financial empire. The Rothschilds virtually built capitalism in France, laying the foundation of the existing banking system. R. were modern-type bankers and were quick to find their niche on the market, being the first investors in industrial use of oil, in electricity, and in railways. During the nineteenth century and early in the twentieth century, R. had close links with Russia. Lionel R. (1808–1879), Nathan’s son, was for 20 years financial spokesman of the Russian Government, and handled all consolidated railway loans. The R. invested huge financial resources in the Baku-Batumi railway line to carry the crude of Baku oil fields. Then, the R. barons financed the construction of oil depots and refineries, and in 1886 established the “Baku Company for Oil Processing and Trade” (BNITO), which (together with the Nobels) processed 30% of the world oil production. All told, the R. exported from Baku via Batumi 27 million 600 thou poods (1 pood = 16 kg) of kerosene. In 1911, the R. sold the BNITO Company to their competitors “Royal Dutch Shell.” At present, there are two branches of R.: British (finance, Central London Bank “N.M. Rothschild and Sons”); mining monopolies of South Africa, oil industry and non-ferrous metallurgy) and French (financial nucleus – “Rothschild Bank”).

The name of R. has long been common, symbolizing countless riches, while the catch phrase “rich like Rothschild” entered the lexicon of the thanks to French writer Stendhal’s good graces to become popular worldwide.

Rubas – river in Daghestan that originates from springs in the Jufudag Mountain Range. It reaches the Caspian Sea near Arablyar Village. Its catchment area is 1,190 km². The river floods in summer and has low-water in winter. Main tributaries are Kamyshchai and Kazchag-Su. Its width is 6 m. In winter, the upper reaches are covered with ice. In the lower reaches, R. is used for irrigation only.

Rudsar (Roudsar) – port city in the mouth of the Rudsar River on the Iranian shore of the Caspian Sea, in Gilan Province. Its population is 18.4 thou people, and it is connected with Rasht by the Langaroud and Lahijan highway. It has a rice-hulling factory and fisheries. R. is convenient for the berthing of ships when the weather is calm.

“Russian Caviar”, JSC – large fish-processing enterprise in Astrakhan Region, producing fish delicacies of sturgeon varieties, balyk-based items, and caviar for export. Along with processing sturgeon, the enterprise processes products based

on small fishes: vacuum-packed frozen fillet, cold-smoked fish, sun-cured fish, and balyk from small fish varieties. For years, the enterprise has won world prizes.

Russian Empire – established on the basis of the Russian state which, in 1721, Peter I proclaimed as an empire. R.E. included the Baltic states, right-bank Ukraine, Belorussia, and the North Caucasus. Furthermore, early in the nineteenth century, the empire included Besarabia, the greater part of Poland (Polish Kingdom), Finland, Transcaucasia, and Kazakhstan; by the second half of the nineteenth century, it also included Central Asia and the Pamir Mountains. By the end of the nineteenth century, R.E. occupied an area of 22.4 million square kilometer. According to the 1897 census, the population of R.E. was 128.2 million people. Over 100 different peoples lived in R.E., with non-Russians accounting for 57% of the population. In 1914, the territory of R.E. was divided into 81 counties (or provinces) and 20 regions; there were 931 cities. Part of the counties and regions were united in Governorates General (Warsaw, Irkutsk, Kiev, Moscow, Circum-Amur, Steppe, Turkestan and Finland). The official vassals of R.E. were the Bukhara Khanate and Khiva Khanate. In 1914, Uryankhai Territory was admitted under the protectorship of R.E. Territories of the present independent Circum-Caspian states – Azerbaijan, Kazakhstan and Turkmenistan – were a part of R.E. R.E. was a hereditary monarchy headed by the emperor, who exercised autocratic power. His family members and relatives constituted the emperor's family. In 1906, representative agencies of state power were established: the State Duma and State Council. The dominant church, the Russian Orthodox, was governed by the emperor through the Synod.

The entire population was regarded as subjects of R.E., and the male population (at 20 years of age) swore fealty to the emperor. R.E. subjects were divided into 4 social classes: gentry, clergy, urban, and rural men. The local populations of Kazakhstan, Siberia, and a few other regions constituted independent "condition."

The state language was Russian. R.E. emblem was a double eagle with tsarist regalia, and the state flag was a panel with white, blue and red horizontal bands. The national anthem was "God Save the Tzar."

The February Revolution of 1917 overthrew the autocratic government, and on 02.03.1917 the last Emperor, Nikolay II, renounced his throne. On 01.09.1917, the Provisional Government declared Russia a Republic.

Russian Federal Research Institute for Fishery and Oceanography (VNIRO) – located in Moscow, it was established in 1933 by order of A.I Mikoyan, the USSR People's Commissar for Supplies whereby it was decreed to merge the All-Union Research Institute of Sea Fisheries and the State Oceanographic Institute. VNIRO is the leading institute in the system of organizations authorized by the state to study, preserve, and reproduce fish resources. In the USSR the system comprised AzovNIRKh; AtlantNIRO; KamchatNIRO; CaspNIRKh; PINRO with its North Division, SakhNIRO; and TINRO-center with Magadan, Khabarovsk and Chukotka Divisions.

VNIRO's main object is the elaboration of up-to-date scientific principles for the development of Russian fisheries and protection of its interests at the departmental and international levels, consolidation and promotion of the unified system of fisheries institutes, and coordination and improvement of system performance.

In 1983, VNIRO was awarded The Red Banner of Labor for successes scored in the development of fisheries science and adoption of new methods of fishing and fish processing.

VNIRO, besides pursuing its primary object that consists in coordinating research carried out by the system of fisheries research institutes, undertakes research in the following areas: integrated study of marine bio-resources with annual forecasting of non-detrimental yield of major commercial hydrobionts; the study of environmental problems of water bodies and of climatic framework of bioproductivity; and the development of biological framework and biotechnology of industrial cultivation of marine organisms. Emphasis is laid on matters of reproduction of salmons and sturgeon fish species and on acclimatization of valuable commercial items; the study of methods of processing raw fish material; development of non-waste resource-saving technologies; and development of new foods, including those intended for medical treatment and disease-prevention. From 1980 to 1990, VNIRO was increasingly concerned with the problem of accurate estimation of the size of maximum permissible yield (MPY) on the basis of several independent indices.

VNIRO places strong emphasis on improving methodological principles of fisheries research, in particular, fishing theory, mathematical simulation, etc. Integrated study of marine and oceanic ecosystems is carried out with the aid of data provided by aircraft and satellite observations, corroborated by up-to-date hydrochemical and hydrophysical investigations.

Russian Federation – Russia – state in the eastern part of Europe and in the northern part of Eurasia. In the northwest, it borders with Norway and Finland; in the west, with Poland, Estonia, Latvia, Lithuania, and Belorussia; in the south, with Ukraine, Abkhazia, Georgia, South Osetiya, Azerbaijan, and Kazakhstan; in the southeast, with China, Mongolia, and North Korea. The area of Russia is 17,075.4 thou km². The length of dryland frontiers is 20,322 km and of sea frontiers is around 38,000 km. Its population is 142 million people (2009), and its mean population density is 8.3 persons per 1 km². The Russians account for 79.8% of the population (2002); over 100 other ethnicities also live in R. Religions represented are Christians (mostly Russian Orthodox), Muslims, Jews, Buddhists, and others. The capital city is Moscow.

The northernmost point on the continent is Chelyuskin Cape on Taimyr Peninsula; the southernmost point is in Daghestan on the border with Azerbaijan. The distance between the western and eastern frontiers is 9,000 km, covering 11 time zones.

The territory of R. is bordered by 12 seas that belong to the basins of 3 oceans: Atlantic (Baltic Sea, Black, and Azov Seas), Arctic (Barents Sea, White Sea, Kara Sea, Laptev Sea, East-Siberian Sea, and Chukcha Sea), and Pacific (Bering Sea, Sea of Okhotsk, and Sea of Japan). It also borders the enclosed Caspian Sea.

Plains prevail on most of R. territory. In the west, lies the East European Plain, within which low uplands are combined with lowlands (Circum-Caspian Lowland and others). Its eastern boundary is the Ural Mountain system. To the east of the Urals stretches the West-Siberian Plain. In between the Yenisey and Lena Rivers is

the Middle-Siberian Tableland, where in places mountain massifs arise; in the east, the tableland is succeeded by the Central Yakutian Plain.

Mountain areas are prevalent in the east and south of the country. On the European territory of R. are the ranges of the Greater Caucasus northern slope (the highest point in R. is Mt. Elbrus, at 5,642 m). The mountains of Southern Siberia are the Altai of the Salair Chain of Hills, Kuznetskii Alatau, Western Sayan, mountains of Tyva, Circum-Baikal area, Trans-Baikalia. In the northeast of Siberia, in the Far East of R., are dominant mountain ranges of medium height. Along the Pacific shore are the mountains of the Kamchatka and Kuril Islands, which have active volcanoes.

R.'s greater part is within the temperate zone; the islands of the Arctic Ocean and Northern areas of the continent are in the Arctic and subarctic belts; the Black Sea shore of the Caucasus is in the subtropical belt. The climate is continental nearly everywhere, though in Siberia and in the northern areas of the Far East it is sharp continental. In the south of the Far East is a temperate monsoon climate. Mean temperatures of January from 0°C (in the Circum-Caucasia) to -50°C (in Yakutia), while July temperature range from -1°C (on the northern shore of Siberia) to 26°C (on Circum-Caspian Lowland). Maximum precipitation falls in the Caucasus Mountains (up to 3,300 mm/annum). Minimum precipitation falls on the semi-desert areas of the Circum-Caspian Lowland (around 170 mm/annum). The length of the snow-cover period is from 60 to 80 days in the south of the country to 260–280 days in the Extreme North.

In R., there are around 120 thousand rivers of 10 km and more km in length. The largest ones include: the Ob with Irtysh, Lena, Yenisey, Kolyma, Amur, Don, Kuban, and Neva. The Volga and Ural flowing into the Caspian Sea are part of the internal water basin. There are nearly 2 million fresh and salt lakes in R. The largest lakes are Baikal, Ladoga, Onega, and Taimyr. The largest storage reservoirs include Bratskoe, Krasnoyarskoe, Zeiskoe, and Ust-Ilimskoe as well as the storage reservoirs of the Volga-Kama Reservoir Cascade: Kuibyshevskoe, Volgogradskoe, Rybinskoe, and others.

In the plains of R., there are distinctly outlined zonal differences in natural conditions: seven natural zones of the arctic, subarctic and temperate belts (from the north to the south) are distinguished, including arctic deserts, tundra zones, forest-tundra zones, forest zones, forest-steppes, steppes, and semi-desert zones. The narrow strip of the Caucasus Black Sea coast is part of the forest zone of the subtropical belt. Altitudinal zones are distinct in the mountain areas. There are 93 state-owned reserves and 31 national parks in R. (1996).

R. is endowed with the world's most powerful potential of mineral resources. As far as coal, iron ores, potassium salts, and phosphate raw materials are concerned, Russia accounts for 30% or more of the reserves worldwide. Russia's ratio of the world's natural gas production is up to 30%, of the ores of rare, non-ferrous and noble metals up to 10–20%, of oil 15–17%, of iron ores up to 14%, and of coal 5–6%.

Oil and natural gas prevail in the country's fuel-and-energy balance and in export of raw materials. Most of the oil and natural gas (50–75%) is in West Siberia. The

drilling of the North Caspian for oil and gas has commenced. The world's largest iron-ore basin, the Kursk Magnetic Anomaly, is in the European part of R. Most of the known ores of non-ferrous, rare and noble metals are in the Asian part of the country: in the Urals, in Trans-Baikal, in Yakutia in the Far East, and on Chukotka Peninsula.

At the beginning of 1996, there were 1,087 cities, 2,022 towns, and 24,307 rural settlements in R. Major cities (with population over 1 million people) Moscow, St. Petersburg, Novosibirsk, Yekaterinburg, Nizhny Novgorod, Samara, Kazan, Omsk, Chelyabinsk, Rostov-on-Don, Ufa (2009).

R. is a democratic, federal state with a republican form of government. The current Constitution was adopted in 1993. There are 83 constituent entities of the Federation that enjoy equal rights in R. (2009): 21 Republics, including two on the Caspian (Republic of Dagestan and Republic of Kalmykia); 9 territories; 46 regions, including the Caspian Astrakhan Region; 2 cities of federal significance (Moscow and St. Petersburg); 1 autonomous area; and 4 autonomous districts. The official (state) language throughout R. is Russian. In compliance with the decree of the RF President, Federal Districts were established in R. in 2000.

The head of state is the President, who is also Supreme Commander-in-Chief of the Armed Forces and is elected by general election. The RF Government exercises the executive authority. The Premier of the Government is appointed by the President subject to the consent of the State Duma. The representative and legislative body of the RF is the two-chamber Federal Assembly (the Federation Council and the State Duma). Each constituent entity of the Federation is represented by two persons in the Federation Council: one of the representative and executive bodies of state power. The State Duma is made of 450 deputies, which are elected from the party lists on the basis of a system of proportionate representation. The deputies of the State Duma are elected for a 5 year period.

In the 1st millennium B.C.E., cities-states on part of the territory of R. included Bosphorus State and the state of Scythians. In 552–745, part of the territory of R. occupied the state of the Turks tribal union, the Turk Kaganate. From the mid-seventh to the end of the tenth century, in the Lower Volga, in the Northern Caucasus, and in the Circum-Azov was the state called Hazar Kaganate. In the tenth to fourteenth centuries, in the Middle Volga area and in the Circum-Kama area was Volga-Kama Bulgaria. In the ninth century, the Ancient Russian State came into being. In 988–989, Christianity was adopted as the state religion, and in the twelfth to fourteenth centuries, there existed the Novgorod Republic, the Great Principality of Vladimir, Galitsko-Volynskoe, and other Principalities. In the thirteenth century, the Russian Principalities, The Volga-Kama Bulgaria and others, were subject to the Mongol-Tatar Invasion (1237–1242), while the Novgorod and Pskov Lands fell under Swedish and German aggression (the Neva Battle, 1240; the Battle of the Ice, 1242). The Mongol-Tatar Yoke that lasted nearly 250 years ended in the banishment of the invaders by united forces of the Russian lands (Battle of Kulikovo, 1380; “Great Stand on the Ugra River”, 1480). Late in the fourteenth century until the mid-sixteenth century, the territory of the Russian State took shape around Moscow,

including the lands of northeastern and northwestern Russia. Late in the sixteenth century to early in the seventeenth century, serfdom was common. Early in the seventeenth century, R. rebuffed Polish-Lithuanian and Swedish interventions. In mid-seventeenth century, Ukraine acceded to the Russian State. The seventeenth and eighteenth centuries were marked with mass resurrections of Cossack peasants. The Petrovian reforms (end of the seventeenth century – the first quarter of the eighteenth century) were conducive to socioeconomic and cultural development of the country. Russia emerged victorious in the Great Northern War of 1700–1721, having secured its access to the Baltic Sea. As a result of annexing during the sixteenth to nineteenth centuries the areas of the North, the Volga region, the Urals, Siberia and the Far East, there emerged a multinational state – the Russian Empire. R. beat off the invasion by Napoleon in the Patriotic War of 1812. The peasant reform of 1861 abolished serfdom.

At the end of the nineteenth to early in the twentieth century, there emerged political parties (RSDRP, Party of Socialist Revolutionaries, the “Union of Russian People” and others). The defeat in the Russian-Japan War of 1904–1905 aggravated the situation in the country, leading to the Revolution of 1905–1907. During the revolution, the transition began to a constitutional monarchy, and the State Duma was established. Russia, being part of the Entente, took part in WWI of 1914–1918. During the February Revolution of 1917, serfdom was overthrown completely. On 25.10.1917, the October Revolution struck, proclaiming the power of the Soviets of the workers’, soldiers’ and peasants’ deputies. In January of 1918, the Russian Soviet Federal Socialist Republic (RSFSR) came into being. The Civil War of 1917–1922 and military intervention assisted the assertion of the military communist principles of society organization. All political parties, except the party of Bolsheviks, were banned; the Communist party dictatorship was virtually established in the country. In 1921, new economic policy (NEP) was proclaimed. On 30.12.1922, the RSFSR, Ukrainian SSR, Belorussian SSR and Trans-Caucasian Federation (TSFSR) instituted the Union of Soviet Socialist Republics (USSR). During World War II (1941–1945), a considerable part of R. was occupied by German troops.

At the time of perestroika, on 12.06.1990, the 1st Congress of People’s Deputies of the RSFSR passed a declaration on state sovereignty of the RSFSR. In March of 1991, the post of RSFSR President was instituted. B.N. Yeltsin became the first Russian President. In December of 1991, the leaders of the RSFSR, Ukrainian SSR, Belorussian SSR signed the Belovezh Accords, stating the cessation of the USSR and formation of the Commonwealth of Independent States (CIS). In 1992, implementation of the economic reform (transition to market economy) commenced. In September of 1993, the President decreed the abolition of the system of the Soviets. In December of 1993, the Constitution of the Russian Federation was adopted; the Federal Assembly election was held. In 1996, B.N. Yeltsin was re-elected President of the Russian Federation for the second term. In December of 1999, B.N. Yeltsin resigned without waiting for the end of his term, and V.V. Putin was appointed as President. In 2008 D.A. Medvedev was elected as President.

R. is an industrial and agricultural economy. Many kinds of mineral fuel are produced in the RF; these are dominated by oil (including gas condensate) and natural gas: 2/3 of oil and over 90% of all gas is in West Siberia. Prominence is also exhibited by the Urals and Volga region as Timano-Pechora oil-gas province. There are systems of main gas pipelines in Russia: Central, Volga Region, Siberia-Center and others. Also operational are gas pipelines leading to the neighboring countries as well as gas pipelines Urengoi-Western Europe, Yamburg-western frontier of the RF. The coal basins: Kuznetski-Pechorski, Yuzhno-Yakutski, Kansko-Achinski and others. In R. are united energy systems of the Center, Northwest, Volga Region, North Caucasus, the Urals, Siberia, and the Far East. Along with the numerous thermal power plants, there are also nuclear power stations as well as the high-capacity Volga-Kama and Angara-Yenisey hydropower chains.

In R. are three bases of metallurgy: the Urals, Central, and Siberian. Non-ferrous metallurgy is quite diverse; its main areas are the Urals, Northern region, Siberia, and the Far East. Machine building is omnipresent, but is best developed in the Central and Volga-Vyatka Regions, in the Volga Region, and in West Siberia. Machine-building is diversified and includes heavy, general, nuclear-industry-oriented, and manufacture of instruments, machine-tools, tools, etc. The crucial areas of chemical and petrochemical industry are Central, Northwestern, Volga Region, the Urals, and Western Siberia. R. is one of the crucial exporters of forest industry products. The main areas of this production are Northern, Volga-Vyatka, the Urals, West Siberia, and the Far East. Food and light industry, especially textiles, are important. The main areas of fabrics manufacturing are the Central and Northwestern Regions.

R. is an economy in transition. Around 70% of GDP is produced in the private sector. The ratio of services in the GDP structure equals 45.7%, which is due to the rapid growth of tariffs on paid services. There were some positive trends in economic development (declining rates of inflation, slowing down of the setback in industrial production in general, arrival of benign situations in export-oriented industries, growing volumes of foreign-economic activity, and others); by and large, the socioeconomic crisis has not been defused, however, nor has the number of crucial problems been resolved to ensure the process of financial stabilization: domestic demand has kept declining, the same applies to the drop in public production, investment activity has been low, non-payments have continued to grow, and real incomes of the population have been as low as ever. Creditworthiness (a correlation between monetary funds and arrears before suppliers) of industry, agriculture, and transport has declined. The hard financial circumstances of enterprises are due to the lack of circulating capital, which disrupts the process of funds reproduction and reduces creditworthiness.

Nearly 60% of agricultural lands are arable. More than 4/5 of it is in the Central and Central-Chernozem Regions, the Volga Region, the North Caucasus, the Urals, and Western Siberia. Arable farming accounts for nearly 50% of gross production in agriculture and around 50% in animal husbandry (milk and meat, milk and wool). The staple crops are grains. Sugar beets, sunflower, potatoes, vegetables, and lint are other products. Major wheat growing areas are the Volga Region, the North

Caucasus, Western Siberia, the Urals and the Central Chernozem Area; lint fiber growing is practiced in the Central Area and in the Northwest; sunflower is cultivated in the North Caucasus, the Volga Region, and the Central-Chernozem Area; sugar beets are cultivated in the Central-Chernozem Area and the North Caucasus.

RF is a major transport power, and all modes of transport are available: railways, airways, sea transport, river, motor, pipeline, and metro (subway) transport.

Foreign trade turnover (i.e. RF import and export) grew at a faster rate than dynamics of production of particular goods. Export items included fuels and petrol, oils and lubricants, raw materials, plant and equipment, textiles, chemicals, products of manufacturing industry, and other items. European countries account for 2/3 of export and import operations.

There are over 500 higher educational establishments in the RF. Major university and institute centers are Moscow, St. Petersburg, Yekaterinburg, Novosibirsk, Tomsk, and others. The Russian Academy of Sciences is in Moscow.

The Russian television broadcasting system includes the TV and radio federal-level companies “Ostankino” and “All-Russian,” and regional companies, including “Moscow,” “Saint Petersburg,” “NTV,” “TVC”, and others. Local channels exist in most cities and district centers.



Russian Federation, topographic map (http://maps.grida.no/go/graphic/russian_federation_topographic_map)

Russian Oil-Industry Company – established in 1896 in St. Petersburg, it owned the oil fields of Baku District in Baku Province and a kerosene plant (35 workers) in Baku. In 1903, the company was worth Rbls. 3.5 million. The Chairman of the Board was G.M. Lianozov. In 1913, it was worth Rbls. 2.2 billion.

Russo-Persian Treaty – see *Petersburg Treaty of 1723*

Russo-Persian Wars – (1) 1722–1723 – see Persian campaign of 1722–1723; (2) 1796 – see Persian campaign of 1796; (3) 1804–1813 – the war commenced by Persia after the Russian government declined the ultimatum to withdraw Russian troops from Trans-Caucasia. Following a number of successful battles, Russian troops occupied the territory of North Azerbaijan. The war ended with the Gulistan Treaty of 1813; (4) 1826–1828 – started by Persia with a view to regaining East Trans-Caucasia. Russian troops occupied Nakhichevan, Erivan, and Tabriz. It ended with the Turkmanchai Peace of 1828.

Rutultsy – (self-name – “mykh abdyr”) – people in the Russian Federation (30 thou in 2002), in the south of Dagestan and the upper reaches of the Samur River (24.3 thou people). R. also live in the Azerbaijan Republic (500 people). Their language is Rutul, which is of the Lezgin group of the Dagestan branch of the Iberian-Caucasian languages. Dialects include Mukhad, Ikhrek, Shinaz, Myukhrek, and Borchin-Khnov. They are Sunni Muslims.

Ruysbroeck Willem van (Wilhelm von Rubruck) – Flemish Franciscan monk and a traveler of Asia (b. 1210, died 1270). From 1253 to 1255, on commission by Pope Innocentius IV and the French King Louis IX, undertook a diplomatic mission to the court of the Mongolian Prince Munke (Menge) in Karakorum (Mongolia). R. set out for the Crimea, landed at Sudak, walked through the peninsula, then along the coast of the Sea of Azov to the Don River and on to the Mongolian camp Sarai near present-day Volgograd. In 1253, R. approached the camp of the Great Khan in the vicinity of Karakorum in Mongolia. In July of 1254, he walked back via Balkhash Lake toward then Volga, reached Astrakhan, turned south and continued along the western shore of the Caspian Sea via Derbent, Nakhichevan and on via Armenia, Kappadokia, Ayas (currently Iskanderon), Cyprus, and Anthiokhia. In 1255, he reached Tripolia. R., on the strength of questioning people alone, was able even at that time to report that the Caspian Sea was no bay of the ocean at all, which contradicted the view shared by absolutely all geographers until the sixteenth century. R. wrote: “This sea is surrounded by the mountains on three sides, yet in the north the sea is adjoined by a plain. One can go round this sea in 4 months, and Isidore is wrong (obviously, Isidore of Seville is meant here, an encyclopedic writer of the early seventh century who followed the ideas of classical authors) saying that this is a bay of the ocean, for it never touches the ocean and is surrounded by land on all sides.” Upon R.’s death, descriptions were left of all of his journeys – a masterpiece of medieval reports on the life of the Mongolian state of that time. His composition written in Latin was published in 1589, and subsequently was translated to English, German, Russian, and French. The Russian translation was published as “Travel to Oriental Countries,” Moscow, 1957.

Rybachii Island – part of Tuylenii Islands, located at the entrance to Mangyshlak Bay. Structured by sand and shells.

Rybnitsa – (1) fishing deck vessel with a 16–20 t tonnage; (2) vessel of up to 60 t tonnage for transporting fish from the sea to fish-processing factories in Astrakhan;

(3) (obs.) sail or sail-motor fishing vessel, popular on the Caspian Sea and at one time serving as the base for several budarkas, mooring boats, or seiners. When fishing was in progress, R. was berth anchored. R. had cabins for 6–9 fishermen. The middle hold was used for keeping fishing gear and fish. During the Civil War, R. were used by the Red Army for mine-laying in the Caspian Sea.

Ryn-Sands – hummocky longitudinal dunes in the Circum-Caspian Lowland in the waters of the Volga and Ural Rivers in Astrakhan Region and the Republic of Kazakhstan. One of the largest tracts of drift eolian sands. In the south, R.-S. Give way to Batlaisagy, Kosdaulet, Buzanai, and Menteke sands. The area is around 40 thou km². It has a closed drainage territory, largely devoid of river networks and fresh-water bodies. There are salt lakes with a chloride-sodium bittern (100–120 g/l) here and salt-water sors in the hollows of meso-relief that are watered in spring at regular times. They are covered with herbaceous and shrub vegetation. Fresh ground waters are not far from the surface. R.-S. were formed as a result of ancient-lacustrine and alluvial deposits being drifted. The R.-S. area was first settled by humans around 11.5 thousand years ago. Most of it is part of the Republic of Kazakhstan.

S

Safid Rud (Sefid Rud) – sometimes known as Musachai, it is the name of the lower reaches of the Gezeluzan River, the largest river on the Iranian shore of the Caspian Sea. It originates on the slope of the Zagros Mountain Range and is formed by the confluence of the rivers Shahrud and Gezeluzan near Manjil Mountain. Here, it flows in the narrow gorge of the Elburz Ridge, then in the Gilan Valley. The length of the river from its main tributary is 800 km and its catchment area is 67 thousand km², which accounts for more than half of the area of the basin of the Iranian rivers falling into the Caspian Sea. The mean discharge is 141 m³/s. At the confluence is a headwork (a dam over 100 m high), hydropower station of 90 MW and a storage reservoir. Its waters are used for irrigation. In the delta of S., whose area is over 3,500 km², is Rasht City. The river is not navigable in its upper and middle reaches but widens in its lower reaches and has a depth of up to 2 m. The banks are precipitous, with heights reaching 5–6 m. S. is the only river of the South Caspian where sturgeons go upstream to spawn.

Safid Rud River Delta – the delta plain begins roughly in the area of Rasht City, Iran, some 60 km from the Caspian Sea. The delta is confined to the northern termination of the Elburz Ridge, stretching almost parallel to the shore line. The extensive delta deposits occupy an area of around 1,800 km². The powerful flow of river sediments assisted in the build-up of land in the area and changed the point of river influx into the sea, which expedited delta development. The last change occurred around 500 years ago, and until now the old channel is referred to as Old Sefid Rud. It flows into the sea west of Sefid Rud Cape. At present, the Sefid Rud flows into the Caspian Sea near Kiyashahr Town. The existing one-arm SRRD occupies an area of around 40 km² in the form of a triangle. The width of delta's main channel is 100–120 m, and its depth is 1.5–2 m. The delta area is low-lying, water-logged and overgrown with reeds.

Sagiz – urban village in Makat District, Atyrau Region, Republic of Kazakhstan. Sited on the Sagiz River 18 km from Railway Station Makat. Center for oil production.

Sagiz – river in Akmolinsk and Atyrau Regions, Republic of Kazakhstan. Its length is 494 km, and its basin area is 18,000 km². It originates on the Suburals Plateau

and flows mainly within the Circum-Caspian Lowland, terminating as a system of sors 60–70 km to the point of inflow into the Caspian Sea. In the upstream segment, before the confluence with the Terisakkan River, the banks are high and precipitous, while in its lower reaches the river valley is only slightly graded, the channel is winding, and the river flows within gently-sloping banks. The main source of feeding is snow. The river freezes at the end of November and thaws early in April. In summer, the water is brackish and is preserved in some pools only. It is used for irrigation.

Saiga Antelope (*Saiga tatarica* L.) – wild hooved mammal of 30–40 kg. Lives in herds with populations at the time of migrations reaching tens of thousands of heads. Pregnancy lasts 5 months, and adult females give birth to two whelps. Mortality of the young is around 20%, and the increment of population reaches 60–80%/annum. S.A. are well adapted to living in the sands and in clayey semi-desert, both of which constitute their single habitat. S.A. are capable of getting food from under the snow to a depth of 20 cm. Even in unfavorable years (with a thick snow cover, snowstorms, icing), S.A. only lose 30–40% of population, mainly thanks to adult males. The high speed of S.A. movement (70 km/h and faster) enables them to find areas with more favorable conditions. They are subject to commercial hunting, and prosee up to several 100 t of meat during a year. It is believed that 30–40% of the livestock may be shot off with no detriment to the population. The main regions of S.A. natural occurrence in the Circum-Caspian area are the Republic of Kalmykia and Volga–Ural River interfluve.



Saiga antelope (http://img-fotki.yandex.ru/get/2708/usikn.15/0_25acc_240974a_-3-XL.jpg)

Salination – quality of salted fish, see *Tuzluk*

Salse – a form of mud volcano that is a hopper-shaped water-filled half-angle cone, with escaping gases. On Buzachi Peninsula, S. reach 90 m in diameter, their edges raised to the height of 1 m.

Salting – a method of curing red fish eggs. Depending on the quality and freshness of fish as well as market requirements and processing conditions, eggs are processed into salted granular caviar in cans, salted granular caviar in brine, pressed caviar and jastichnaya caviar.

Salyan – a city and the center of the Salyan District of the Azerbaijan Republic. Situated on the right bank of the Kura River, 3 km from the railway station. The arm Akusha branches off from the Kura River to Salyan. The population is 31 thou people (1992). Until recently, S. was a major port on the Kura River Ships used to call here from Kyzylagach Bay harbor via Kura's arms–Bala–Kyur and Gyami–Duran. Until 1910–1911, these arms used to inflow to Gorky Kultuk Bay (the former) and Kyzylagach Bay (the latter). It has a fish factory, a cotton ginnery, a medical secondary technical school, and an agricultural secondary technical school.

Salyan Sea – *See Caspian Sea, Names*

Salyan Steppe – situated in the south of the Azerbaijan Republic, SS is part of Mugan Steppe that was formed by delta debris cones of the Kura River S.S., later than all other steppes of the Circum-Caspian Lowland, broke free of the sea during historic times, which played a decisive role in the structuring of the soil and plant cover. They presume that the ancient delta of the Kura River was previously here. On the other hand, its formation in large measure depended on the hydrological conditions of the Caspian Sea and, above all, of Kyzylagach Bay: decrease of its area was accompanied by the buildup of the river deltaic deposits. The southeastern part of S.S. is watered by a natural irrigation canal – the western arm of Kura Akusha, while the southwestern and southern parts are watered by the Mugan–Salyan Canal.

Samur – (Turk. *marten*) a river, many years ago, there were lots of martens in the woods along the river flow (hence, the name). Daghestan's second largest river in terms of its catchment area and water abundance (96% of runoff is formed in Daghestan) flows along the border between Russia and the Azerbaijan Republic (its length 38 km; the border passes across the so-called "Golden Bridge"). S.'s springs are at the height of 2,880 m above the ocean level in the glaciers of the Greater Caucasus Mountain Range near Mt. Guton, on the slopes of Taklik Ridge. S. reaches the Caspian Sea by several arms, forming a delta common with the Gulgerychai River Samur Lake was built in the Samur River delta in 1960. The river is 213 km long, and its catchment area is 4,990 km². Around 80% of the river basin lies above 1,500 m. The Samur River Basin comprises 65 tributaries. The largest tributaries are Gulgerychai (36 km), Usukhchai (37 km), Kara–Samur (30 km), Ata–Chai (63 km) and others. Feeding is mixed, coming from rains, snow, and glaciers. Its water flow is 1.6 km³/annum, with sediment runoff of 4.7 million tons/annum. Under the 1967 protocol of the former USSR Ministry of Land Reclamation and Water Management, Azerbaijan's share of the water intake amounted to 50% of the annual runoff, while the share of the Russian Federation was 15% (the balance being for ecological release). Nearly 90% of river water goes to the Samur–Apsheron Canal, Samur–Divichin, and Samur–Derbent Canals. Four hydroelectric plants have been

built. The canals supply water for Derbent, Sumgait, Baku and other cities as well as water for the irrigation of tens of thousands of hectares of agricultural lands in the maritime areas of Daghestan and Azerbaijan. Only 9% of the runoff reaches the mouth and delta woods of the Samur River. After the collapse of the USSR, water apportioning of the Samur River between Russia (Daghestan) and Azerbaijan has been a serious problem. Negotiations continue.

Samur–Apsheron Canal – comprised of two canals, the Samur–Divichin (first stage, 108 km long, built by the people’s construction effort method from 1938–1940, until 1953 called the I.V. Stalin Canal) and Apsheron Canal (74 km long), the Azerbaijan Republic. The S.–A. Canal originates from the Samur River and ends 20 km from Baku in the north–western part of Apsheron Peninsula. The S.–A.C. facilities include headworks on the Samur River, a canal from the Samur River to the Atachai River, a canal from the Atachai River to Jeiranbatan Storage Reservoir, and the main canal to Zyrya Settlement with an irrigation system on Apsheron Peninsula. In 1960–1965, the S.–A.C. was remodeled, which made it possible to irrigate 100 thou ha of lands in the northeast of the Republic and on Apsheron Peninsula as well as to increase and improve industrial and public water supply of the cities adjoining the canal, surrounding districts, and the city of Baku. The Canal’s length is 182 km, with a discharge of 55 m³/s.

Samur–Divichin Canal – see *Samur–Apsheron Canal*

Samur–Divichin Lowland – shaped as a narrow strip to the south of the Samur Delta along the sea as far as the Bogas Plain on the Apsheron Peninsula, hemmed by a sandy beach in the Azerbaijan Republic. The lowland adjoins the Kusar inclined plain. The relief, starting from the shore of the Caspian Sea (–28 m) and including the foothills (200 m), gradually rises. The surface is structured by alluvial, alluvial–proluvial, and alluvial–marine upper Quaternary deposits. Farther to the south, due to the decreasing number of rivers and declining runoff of the existing water courses, the percentage of marine aggraded deposits and the area of alluvial deposits declines abruptly. The rivers leaving the foothills form a number of alluvial fans that produce irregularities on the surface of the lowland (convex central axial uplifts and interconal depressions) and, widening abruptly, merge in the eastern direction.

The extensive area is occupied by the alluvial fans of the rivers Samur, Kusarchai, Kudialchai, Velvelichai, Karachai, and others. S.–D. L. is characterized by a moderately warm climate of semi-deserts and dry steppes. The temperature of the coldest month averages between –3 and +18°C, while the warmest month are above 22°C. The absolute minimum of air temperature was –20°C, the absolute maximum was +42°C. Annual precipitation in the south equals 300 mm and in the north is 400 mm. The number of days with snow cover during the year varies from 10 to 20. Relative humidity is low (30–50%). In April and September, there may be up to 30 days with dry hot winds that are extremely detrimental to the economy (especially, agriculture). Dominant here are westerly, north–westerly, and northerly winds. The mean annual wind velocity reaches 10 m/s (up to 5 points). In the northern part

of the lowland on alluvial–meadow–forest carbonate–free soils prevails meadow–forest, and in the southern part on gray–brown solonetz soils is sagebrush–saltwort landscape. In between the meadow–forest and semi-desert landscapes, on a small area is a transitory steppe landscape. Along the coastal strip of the lowland dominate an eolian–sandy landscape (dunes, hummocky and ridge sands) and sandy beaches. At an advanced stage of development are horticulture, vegetable-growing, grape-growing, grain growing, animal husbandry and other branches of agriculture.

Samur Reserve – established in 1982 in the Samur River Delta, Daghestan, Russia, on an area of 11.2 thou ha to protect rare plants and animals of republican significance. The reserve protects 7.2 thou ha of liane, oak forests, 3 thou ha of herb phytocoenoses, and 1.0 thou ha of wetland complexes.

Samur River Delta – a unique segment of the Caspian shore with an ecosystem disturbed by man-induced impacts that is situated on the territory of Russia (Daghestan Republic) and the Azerbaijan Republic. It occupies the southern part of the Daghestan Maritime Lowland and the northern part of the Samur-Divichin Lowland of Azerbaijan that genetically and morphologically constitute a single formation. The Samur River used to flow into the sea south of the existing delta and formed an Internal beak-type multi-arm delta. When the sea level rose during the NeoCaspian time, and the river broke through to the north of the old channel, the existing two-arm delta was produced: the Malyi and Bolshoi Samur. The area of the Samur alluvial fan or of the ancient SRD is around 200 km². Talking about RSD, scientists usually mean the part of the delta formed by the main arms – Malyi (24 km) and Bolshoi (19 km) Samur. In this case, the delta area is around 80 km². Morphologically, the delta is of a tidal, beak-like type, with an open offshore area, and a level marine edge. The annual water runoff from 1930 to 1997 where the river exits the mountains (Usukhchai Vill.) amounted to 2.6 km³, whereas from 1975 to 1980, due to withdrawals for economic needs, it declined to 1.94 km³. The river's suspended load runoff varies between 2.7 and 13.9 million tons. The Samur mouth offshore is rather steep, with 9-m isobaths running at a distance of nearly 90 m from the shore. The offshore's being steep and open is one of the causes for the unidirectional shifting of sediments along the marine edge of SRD from the north to the south.

SRD is the northern boundary of the spread of warm water rare species. The unique nature of SRD vegetation, besides its great diversity, consists of a considerable presence of Hircanian relict elements as well as of relict moderately-subtropical liana forests. SRD forests regulate the river runoff and produce unique conditions for the reproduction and growth of the Black Sea roach, a valuable and rare fish.

Sand Stabilization – artificial measures taken to prevent the movement of shifting sands through sowing, planting, or assisting the growth of natural vegetation by means of installing various mechanical protection structures made of plants and other materials as well as by using chemical agents producing a solid or sticky film on the surface.

Sanitary Protection Zone – territory and water area in which a special sanitary-and-epidemiological regime is established to prevent the deterioration of water quality in the sources of central domestic-and-drinking water supply and to protect water works.

“Sapozhnikov Brothers” – the oldest fishery company in Astrakhan that started functioning in 1796 but was not officially incorporated until 1819. Before 1856, the company’s daily catches of white salmon reached 5–6 thou. In 1884, on the basis of the Sapozhnikovs fishworks in the village of Voznesenskoye, a canning factory was constructed that produced canned small herring (big-eyed shads) in oil with tomato named “Pilcher”. By 1902 the company possessed fisheries of a total area of more than 29 thou ha. In addition, the company rented some areas from the public treasury. Pike perch, bream, sea roach, herring (salted and dried) were supplied to the market. On July 15, the “hot fishing season” usually began: they caught mostly sturgeons that were delivered alive to users on special barges. In 1904, the company organized lamprey fishing near the village of Ikryanoye. In the same year, the company constructed a refrigerator. Its central office was located in Astrakhan with branches in Tsaritsyn and Nizhny Novgorod. In the early twentieth century, revenues from sale of fish and fish products reached 2 million rubles a year. Its products were delivered to Tsaritsyn, Saratov, and to the famous fair in Nizhny Novgorod, and small fish species were exported to Romania, Greece, and Turkey; caviar of sturgeon and stellate sturgeon was supplied to Austria and Germany.

The Sapozhnikovs were renowned for their benevolence. In 1830, the year of a cholera outbreak, they opened an orphanage, provided financial support to hundreds of families, funded hospitals, and forgave enormous debts. They equipped the resort in Tinaki, which was well-known for its curative mud, and they constructed 8 churches and collected pieces of art.

Sara – peninsula situated in the southwestern part of the Caspian Sea in Azerbaijan. South of the Kura Spit, the shore makes an arc-shaped turn in the south–western direction, forming a spit that sort of grips a part of Kyzylagach Bay in tongs. This newly-formed spit is S. Peninsula and its exterior is a replica of Kura Spit. S. is a low-lying spit with dissected shores, strung roughly 27 km southward. The peninsula is formed as a result of connection of the islands Sara, Baklanii (Kara–Battag), Burany, Sobachii Zub, and Greater and Minor Kulagin after the drop of the Caspian level. S. cuts off Minor Kyzylagach Bay, extending meridionally with an inclination to the west in its southern termination. The length of S. on its eastern side is 52 km, and along the western shore overlooking Minor Kyzylagach Bay it is 18.5 km. S. is separated from the bay’s western shore by a narrow (350–400 m) water passage. Sara Island used to be the southernmost and largest on the entire western shore of the Caspian Sea. It was linked with the Burany Islands by a submerged hill. As a result of shallowing, deposition of silts, and continued growth of reed thickets these islands have merged completely.

The peculiar feature of S. is that its sea shore has a smooth plain; the shores overlooking the bay are all dissected. The shore of the bay is separated from the island hinterland part by a distinct 2.5 m high “ancient” levee girding the whole peninsula.

The hinterland part is formed by Kura deposits produced by sea aggradation. S. is a low-lying and boggy peninsula and is mainly structured by sand and shelly ground. Six different zones can be distinguished throughout the peninsula. The hill and ridges feature typical meadow areas, below are wolfberry shrubs with pomegranate, while in the southern termination and in the northern part are groves (poplar, willow, and other species). The seashore is a lifeless desert, while the peninsula has a rich avifauna, comprising over 90 diverse species and breeds. Also encountered are wild boars, jungle cats, jackals, and foxes. Peter I used S. as a marine base for the 1722 and 1723 Persian campaigns. The Caspian flotilla headquarters was deployed on the Island. Until the end of 1840, the Island was the berthing site of the Russian fleet before it was transferred to Baku Bay.

Sarai, Sarai–Batu – (Old Batu) archeological monument at Selitrennoe Settlement 40 km south of Kharabali City, Astrakhan Region, Russia. The place is called “Selitrennoe gorodishche” (gorodishche – site of ancient settlement). It was the first capital city, a major trading city of the Golden Horde (1240–1330), and founded by Khan Batyi, grandson of Genghis Khan. According to archeological data, the area of its central part is estimated at 10 km², with environs of 36 km² and a population of around 75 thou people. Ibn–Batuta says it was “one of the most beautiful cities on plain land, bustling with active people, with fine bazaars and broad streets; the place was a solid row of buildings, with no vacant spaces or orchards. The city was inhabited by Mongols, Ases (Alans), Kipchaks, Cherkesses, Russians, and Byzantians. Each people lived in its special area, separate from the others. Their bazaars were also located there.” For two centuries, until the mid–fifteenth century, S. played a crucial role in economic life of the Lower Volga. Subsequently, in the second half of the fifteenth century, the place was deserted. The buildings of S. and other cities and settlement of the Golden Horde along the Volga and Akhtuba rivers were preserved until the mid–sixteenth century, when the tzar Fedor Ioannovich ordered them destroyed in 1578 and the city of Astrakhan to be built. Subsequently, archeologists have excavated living quarters and other structures.

Sari – major city of Mazandaran Province, Iran in the north of the country, 30 km south of the Caspian Sea on the bank of the Tajan River at a height of 110–120 m above the Caspian Sea level. Its population was 261 thou people in 2006. In ancient times, the city was called Sarouyeh, but the history of its emergence dates back to the classical time. S. is known to have been the first capital city (eighth to ninth centuries) of the province (at one point, it was called Tabaristan). This was the last part of Iran that accepted Islam after being conquered by the Arabs. After that, Amol became the capital city, while S. was first seized by the Mongols and then was conquered by Tamarlane. From 1937, S. was again the provincial capital. It was linked with the Caspian seashore and Iran’s hinterland regions by highways, and was a major railway station on the Trans-Iranian railway line. Enterprises for processing agricultural products and cottage industries are here. The National Center for the Caspian Sea Exploration is located in S.

Sari Herring (*Alosa brashnikovi sarensis*) – large herring with pale body and silvery sides and belly. Number of gill rakers is from 20 to 33. Number of spondyluses

is from 45 to 53. The habitat is confined to the coastal waters of Azerbaijan to the south of Apsheron Peninsula, yet young fishes are encountered in the north, too, as far as Yalama. It has short migrations for spawning, which occurs from the end of April to the end of June near Byandovan Cape and the islands Oblivnoy, Svinoy, Zhiloy at depths of 3–10 m and water temperatures of 15–28°C. The length of the body is from 22 to 40 cm, while its mass is from 150 to 1,050 g. Sexual maturity is reached at age 2–3 years. It feeds on kilkas, gobies, and shrimps. The reserves of Sari herring, like most fishes with limited habitat, are not great.

Sari Shad (*Alosa caspia knipowitschi*) – Caspian herring the body is high, the head big and convex. The eyes are large. Inhabits coastal water of the western part of the South Caspian (Baku Archipelago, Anzali Bay, Astara). Spawns in fresh or slightly saline water near the shores on sandy shoals. Spawning occurs in May–June. The fish is of low commercial value.

Sarikhum, of Sarikhum, Sarykum Barchan – (in Kumyk Lang. *yellow sands*) a unique natural phenomenon of eolian–aggradational origin, a sandy mountain–dune, and the largest dune in Russia and Europe. The height is 262 m with an area of 3,000 ha. In 1978, the dune area was declared a protected natural monument. It is part of a segment of a State natural reserve situated in the extreme southwest of the Circum-Sulak Lowland at the foot of the Narattyube Mountain Range (650–750 m) on the left bank of the Shura–Ozen River near the former Kumtorkala Settlement, amidst the large sand tract, the Kumtorkala sands. As far as the origin of S. is concerned, there are a number of versions: sands transported by the wind from the Central Asian desert; residual sands from the Central Asian desert that might have stretched as far as Circum-Caspian Lowland; sand mountain associated with hydrovolcanism; or the result of weathering and eolian reworking of the products of destruction of Narattyube Range indigenous sandstones. However, there is consensus about one thing: a peculiar system of winds in this location has resulted in this wonder of nature. The winds originating in Karkar Valley and in Akhgel Basin carry the products of sandstone destruction of the surrounding mountains and, blowing down the pass of the Shura–Ozen River, rush into the plain. Here, the force of the wind dies down and sand is deposited. The largest sand tract extends roughly over 10 km along the valley of the Shura–Ozen River and is 3 km wide. S. is structured by fine and medium–grained quartz sands of light-yellow color. In the north, the dune gradually gives way to a clayey sagebrush steppe, while in the west the dune is closed by a narrow mountain gorge. The flora of the area includes around 30 species on an area of 1,152 thou ha. Encountered here are rare, endemic plant species entered in the Red Data Book of Russia, including *Calligonum aphyllum* Gürke, Mayorov’s cornflower, Karagugin and Leman astragalus, and sharp-lobed blueflag. Fauna is represented by seven species of reptiles (eared Phrynocephalus, sand lizard, slender racer and large whip snake, sand boa, Caucasian viper, and Caucasian agama) and birds (black vulture, harriers, falcon, nightjar, Spanish sparrow). S. was visited by Russian poet M. Yu. Lermontov, French writer A. Dumas and other celebrities.

The Barchan in S. from April 13, 1978 has been declared a protected monument of nature.

Sarytash – a bay that juts into the northern shore of the Tyub–Karagan Peninsula, Kazakhstan. G. S. Karelin noted that the name of the bay originates from the small piece of limed stone that turned yellow as time went on, on which the Turkmen seal that has lived to this day is roughly hewn. The shores of the bay are low-lying and in places are hemmed by sand shoals. All the shores are dissected with ravines and balkas and covered with scarce vegetation. Entering the bay, one cannot help but seeing the 228 m high Mt. Ungoza.

Sarytash – settlement situated on the southern shore of Sarytash Bay, 8–9 km to the east of Cape Sultan–Epe, Kazakhstan. The settlement has a jetty and there is fishing there.

Scientific and Production Sturgeon Culture Center “Bios” – see “*Bios*”

Scow – (1) a motor and non-motor boats for ground evacuation from dredgers provided with special boxes with flapping bottoms for ground disposal into the sea; (2) a small barge, metal or wooden, designed for ground transportation.

“Scyth Bay” – Herodot’s name of Kara–Bogaz–Gol Bay.

Sea Bar – longshore bar formed due to sequential wave-induced movement of sediments from the denting shoreward along the denting edge. Some segments of the bar may jut out above the sea level. One such bar is known to exist in front of the Volga Delta.

Sea Coastal Deposits – shifting aggregations of sediments of diverse origin, formed in the coastal zone and subject virtually to permanent impact of wave fluctuations and coastal streams.

Sea Coastal Strip – sea strip of a width determined by the legislation of a state that constitutes the continuation of the state territory seaward. The S.C.S. regime is established by a coastal state. The S.C.S. width usually ranges from 3 to 12 miles. In Russia, a 12-mile S.C.S. is standard. Any foreign ships are entitled to a free and unhindered passage through S.C.S.; however, a coastal state shall exercise border, customs, and administrative control over the passing ships.

Sea Doctrine of the Russian Federation Until 2020 – approved by the President of the RF on July 27, 2001. The fundamental document that determines national policy of the Russian Federation in the field of marine activity – RF national sea policy. The Caspian region is one of the main regional areas. This regional area deals with the following long-term objectives: determining lucrative to the RF international legal regime of the Caspian Sea, procedure of using fish stocks, oil, and gas fields; activity to be conducted in association with the coastal states aimed at conservation of marine environments; provision of conditions, inter-alia using the capability of the RF constituent entities for deploying and using all components of the marine

potential; renovation of merchant marine and mixed-navigation (river-sea) ships and fishing fleet; opposing the exclusion of Russian fleet from the market of marine shipping services; organizing ferry-boat transportation as part of intermodal traffic with exit to the Mediterranean and Baltic Sea Basins; development remodeling and specialization of existing ports.

Sea Drilling for Oil and Gas – drilling wildcats, exploratory and production wells within the water area of enclosed seas masses (Caspian Sea, Maracaibo Lake), seas (Persian Gulf, Caribbean Sea, Sea of Japan, and North Sea) and on the ocean shelves (California, West Africa, Australia). The drilling is carried out from man-made foundations, ramps, mobile floating vessels, and platforms.

Sea Exclusive Economic Zone – is a seazone over which a state has special rights over the exploration and use of marine resources. It stretches from the seaward edge of the state's territorial sea out to 200 nautical miles from its coast. SEEZ is not part of the state territory. Established to conserve and optimum use of biological and other resources as well as to protect the state's economic interests. The SEEZ is established by the Law of the Sea Convention adopted in 1982.

Sea Fauna – this is a collective name for 14 species of marine animals that found their way to the Caspian Sea from the Azov and Black Seas. These are capable of living in both freshwater and marine water. The sea species propagate at a temperature of 10–35°C. They were introduced through Kumo-Manych strait during recent Holocene (circa 6–7 thousand year ago); from 1918 to 1949 during the acclimatization measures; and after 1952 in ballast or on the hulls of the ships that moved through the Volga-Don Canal. Two species of acorn barnacles, Cirripeda and copepod acarthia, before coming to the Caspian, had settled all over the World Ocean (cosmopolites). The western coastal part of the Atlantic Ocean is the original habitat of Dutch crab and jelly-fish *Mnemiopsis leidyi*. The other sea species are Mediterranean. These include: fish – 2 species of gray mullet; one of bristle worms – clam worm and *Phycopomatus*; Crustaceans – 2 species of shrimps; of mollusks – mitilastr and abra. In addition to these, algae also arrived to the Caspian Sea during the Holocene: plankton diatomous (*rhizosolenia*) and seabed red (*Ceramium*). Of Holocene period colonizers, one can name with certainty cockle mollusk only. The sea species account for nearly one half of the biomass of the Caspian seabed biosystem, yet fishes feed only on abra, cockle, clam worm, and to a lesser degree on crabs. The rest constitute a food deadlock. Crab, shrimps, and clam worms are largely carnivorous animals that lengthen the trophic chain. By and large, they have a negative impact on fisheries. Mitilastr and crab have been instrumental in the extinction of 3 bivalved and dozens of species of gastropod mollusks. The jelly-fish *Mnemiopsis* presents an even greater threat.

Sea Fishery – catching of any biological resources in the oceans and seas (fishery, hunting of sea animals, catching of invertebrates from squids and octopuses to krill and algae gathering).

Sea Oilfield – enterprise operating an oilfield in the ocean and seas. The oil is recovered by setting up prefabricated large-block metal foundations or stationary islands (from which deviated holes are drilled), building floating drill platforms with a support leaning against the seabed, etc. The S.O. in the Caspian Sea are at a distance of several dozens kilometers from the shore (Neftyanye Kamni, and others), at sea depths of up to dozens of meters.

Sea Pollution Control – the assembly of legislative, organizational, and technical actions aimed at prevention or restriction of pollutants disposal into the marine environment. For addressing this problem, various international organizations were established that adopted some conventions and laws and elaborated a list of substances of which disposal is allowed in strictly reserved areas of the World Ocean provided certain rules are observed by them. The convention participants are vested with the authorities to inspect any ship or port treatment installation. Those who are guilty of violation of the established requirements are subject to punishment under the applicable laws of the state in which waters it was detected. The control of compliance with the adopted laws and regulations concerning wastewater disposal on an international level is realized by specially assigned agencies. In Russia, these are the respective divisions of the Ministry of Natural Resources. Special instruments and sensors are installed on ships, aircrafts and satellites for detection of pollution in controlled water areas. Technical facilities for pollution control may be provided on ships, on the installations operating at sea and on the shore. The facilities installed on ships are designed for prevention of sea water pollution with ballast, bilge, sanitary sewage waters, and solid wastes. Special oil separators are operated on vessels at sea for treatment of ballast and bilge waters. They ensure oil removal to a concentration of 15×10^{-6} or less. Sanitary sewage waters are accumulated onboard a ship in special tanks from where they are pumped to the collecting vessels or unloaded on special berths in ports (sometimes by exchange of tanks). A method of wastewater treatment assuming evaporation of liquid and pressing of solid residue is also applied. Such residue does not require much place, has no smell, and may be stored onboard a ship until the end of a voyage. Solid wastes are burnt in onboard incinerators. The facilities used on installations for oil, gas, sand and gravel production, wave energy conversion, etc. are, in general, similar to those pollution control facilities available on ships. The oil drilling platforms should be provided additionally with the respective stock of floating booms for prevention of water pollution with oil and with special tanks for drilling mud storage. On-shore facilities for prevention of sea pollution ensure treatment of solid and liquid wastes received from ships and also wastewaters from industrial enterprises. They include plants for biological water treatment and lines for solid waste treatment. They are usually located in specially reserved area of a port. The efficiency of on-shore wastewater treatment is much higher than onboard a ship and the power consumption and expenses are much lower, too.

Sea Routes – shortest distance between sea ports in the safest and most convenient areas for navigation.

Sea Scirpus (*Bolboshoenus maritimus*, *Scirpus maritimus*) – a reed, omnipresent on the banks of water bodies, in shallow dead-waters, in water-filled ditches, etc. It SS often encountered on salinized soils. SS thickets girdle the western Caspian shore with a strip 10–25 m wide and 5–6 m high. SS population density is up to 100 stems per 1 m². SS thickets are also known under the local name of “krepi” (marshy thickets).

Sea Wars on the Caspian – On November 4, 1722, by order of Peter I, the construction of a military port was commenced in Astrakhan and of war ships of the Caspian military flotilla; these were subsequently used to conquer the Persian cities of Rasht, Anzali, Baku, and Derbent.

In 1780, Russia formed a special fleet of 20-cannon frigates and a 14-cannon bombardment ship for military operations in the Southern Caspian and for guarding sea trade routes. In the course of military operations against Persia, the Caspian flotilla seized Baku and Derbent for the second time in 1796, and subsequently all maritime provinces up to Gilan were also seized.

In 1890, the ships of the Caspian flotilla participated in operations of the Russian expeditionary Corps sent to conquer Turkmenia.

From November, 1917, the Caspian flotilla becomes the main force of Bolsheviks in the region and took an active part in the Civil War. In 1919–1920, its ships took part in the raids along the Volga as far as Astrakhan, Tsaritsyn, and Kazan, and then they carried out landing operations on the Caspian, as a result of which Lagan and Aleksandrovsky Forts were regained from the White Guard forces. Chechen Island was also captured.

In May of 1920, a “raid” by the Caspian flotilla on the Iranian port of Anzali that was controlled by British troops resulted in the capture of 23 ships and troop-carriers, 4 sea planes, 50 field guns, 20 thou artillery shells, 20 radio stations, and other hardware.

In August of 1941, landing ships of the Caspian flotilla, having accommodated units of the 105th mountain division and an artillery squadron, made a sea voyage and placed a landing party south of Astara near Khevi village, supporting the action of the land-based expeditionary corps deployed in the coastal part of Iran.

Sefevids – dynasty of Persian Shahs in 1502–1736. The founder was Ismail I, a descendant of the founder of the Sefevie Order after whom the dynasty was named. The most important representatives of the S. dynasty were Abbas I and Takhmasp I (1524–1576). The dynasty of S. laid great emphasis on the Caspian Sea. S. succeeded in spreading Shiism among the population of the southern Circum-Caspian area, thereby consolidating their authority.

Segoletochek, Seletochek – fingerling of sturgeon, starlet and whitefishes.

Seiches – free, standing waves, rhythmical oscillations (like those of a pendulum) of water level in an enclosed water body, involving the whole of the water mass. In the case of S., there are always one or several points (lines) where the level is constant. These are called nodes (nodal lines). Subject to the number of nodes, S. may be

single-noded or multi-noded. S. in the Caspian Sea are produced by rapid changes of atmospheric pressure or wind over different areas of the sea surface. Seiches oscillations in the Caspian Sea were studied by both statistical analysis of sea level observations at different locations and by theoretical simulation. A comparison of both methods has made it possible to show similar, well-grounded results. It has been shown that independent seiches oscillations emerge not only in the Middle and South Caspian separated by the subsea Apsheron Sill but in large bays, too. The dominant periods of 8.5–8.7 and 4.2–4.6 h have been found, conditioned by the presence of longitudinal seiches in the whole of the Caspian Sea (one-noded and two-noded, respectively). In the Middle Caspian, there is a longitudinal one-noded S. with a period of 5.2 h. For Baku Bay, a period of 4.7 h is assigned, identified as a one-noded transverse S. generated in the South Caspian. Several studies have identified the period of oscillation, which is close to semidiurnal manifestations at all locations under observation and associated with the impact of a semi-diurnal tide. The peak, which is close to diurnal, apparently reflects the impact of breezes. It should be noted that the range of seiches oscillations, judging by the observations at Baku and Makhachkala, may be as high as 50 cm, with the value of the tide not exceeding 2–7 cm.

Seiner – a type of sea fishing vessel.

Seismicity – likelihood and regularity of earthquakes of specific intensity striking. The Caspian Sea and its surrounding areas experience unusually high seismicity. In 1895, in Krasnovodsk city (Turkmenbashi), the strongest earthquake struck (magnitude – 8.2 Richter scale, 11–12 on the 12–point scale). In 2000–2001, earthquakes struck Baku and Makhachkala with epicenters in the Caspian Sea.

Self-Elevating Floating Drilling Rig – floating drilling rig elevated to the working condition above the sea surface with support pillars resting on the ground. SEFDR has a base providing for the required tonnage and stability when afloat. The body houses areas for machinery, equipment, provisions, and accommodation modules. Around the periphery of the body are telescopic support pillars capable of moving up and down. In early designs of SEFDR, the number of support pillars varied from 4 to 12; nowadays, SEFDR usually have 3–4 support pillars. SEFDR are used for exploration drilling at sea depths from 15 to 120 m. At 40–50 m depths round cylinder lags are usually installed. When an SEFDR is afloat, the support pillars are pushed out up to the maximum extent possible; at the drilling location, the pillars are lowered and rest against the ground, whereupon the body is slowly lifted from the water with the aid of hydraulic or electromechanical jacks, while the lower parts of the support pillars are pressed into the ground. The height of the body elevation (clearance) is chosen considering the likely height of the waves and tides. In the case of loose ground, they sometimes use a common lower body – a mudmat binding the support pillars with one another and providing the SEFDR with stability when it rests at the drilling location, providing for extra tonnage when afloat. In the USSR, the first SEFDR, “Apsheron” and “Azerbaijan,” for sea depths of 15–20 m were built early in the 1950s and were successfully used in the Caspian Sea.

Semender – one of the earliest capital cities of Hazaria, known since the seventh century. Semender (Azemender) was believed not to be a city but a territory of Hazaria between the settlements of Tarki (Azami) and Enderi (beyond the Sulak River). At present, they do regard S. as a city, and it is on the territory of the lower part of Tarki Settlement. S. is a Persian name meaning *the last door* as the city was located at the exit from the mountains into steppes, and beyond it, the Serir mountains – areas of interior Daghestan, apparently not too much dependent on Hazars – stretched. S. was a rich, fortified city of artisans on the west, and it was surrounded by precipitous rocks of Mt. Tarki–Tau and thick walls. After the eighth century, the importance of S. waned, as the Hazars moved into the Circum-Caspian area and relocated their capital city to Itil.

Serebryakov Jetty – was sited in the lower reaches of the Kuma River Built by Armenian merchants, the jetty was ransacked on more than one occasion because the river waters did not always reach the Caspian. This history is indicated by the “Book of Large Drawing” and by the map of the North Caucasus of 1719 and 1745. S.J. was called “Tavan–Tolga” (“Five Gravel–Mounds”) by the Kalmyks. Remains of the jetty piles could still be seen in the 1920s. Early in the twentieth century, the jetty was a terminal for grain transport to Central Asia.

Shafa Rud – a river on the Iranian coast of the Caspian Sea, flowing through the western part of Guilan Province to the southeast of Hashtpar. The river originates on the northern slope of the Bogrovdag at a height of 2,200–2,700 m. The watershed area of the river is 400 km², its length is 45 km, and its average gradient is 4.9%. The average flow is 6.0 m³/s. A settlement of the same name is located where the river inflows to the Caspian Sea.

Shah-Deniz – a major gas condensate field in Azerbaijan. It is located 70 km to the southeast of Baku at water depths from 100 to 500 m. The length of the contract area is 30 km, and the width is 12 km. Development of the offshore field was the largest project in 1999. Approbation of the productive horizon “Svita Pereryva” gave a daily inflow of gas of 1,416 million cubic meter and of gas condensate of 377 t. With exploratory drilling, the natural gas reserves were evaluated at 700 billion cubic meter, out of which 400 billion cubic meter are recoverable. The operator of the oil-field development project is British Petroleum. According to an Intergovernmental Treaty between Azerbaijan and Turkey, beginning from 2005 the Azeri natural gas shall go to Turkey. For this purpose, the gas pipeline. Baku-Tbilisi-Erzurum was built in 2006. The initial capacity of the pipeline is 8.8 bln cubic meters (bcm) of gas per year, and after 2012 its capacity could be expanded to 20 bcm per year.

Shakhova Spit – located about 25 km to the southeast of Gousan Cape. The spit is low-lying and sandy. At the base of the spit are small uplands overgrown with scanty vegetation. The shores are shallow. S.B. Cape is the southeastern tip of the spit and of Apsheron Peninsula, Azerbaijan.

Shalyga – an underwater long sandbar on the northern coast of the Caspian; a low-lying, wave-built island in the same area; accumulation bank. Found throughout the whole Northern Caspian. Some of them were islands quite recently. They are most numerous in the near-mouth coastal area of the Volga delta, near the eastern coast and at an outlet from the Mangyshlak Bay. Most often they are U-shaped. Usually their length is 200–400 m, and their width is 5–20 m. Due to sediment drift upward a slope of several banks. There were formed some accumulation islands, such as Kulaly, and shallows in the Volga.

Shalyga Island – located 13.5 km from the mouth of the Zolotoy arm in the south-eastern part of the Ural River delta, Kazakhstan. Its length is about 2.5 km, with a maximum width of 0.3 km and height of 1–2 m (at the mean perennial water level).

Sheefish (*Stenodus leucichthys leucichthys*) – migratory fish of the whitefish family living in the Caspian Sea basin. S. is believed to have come to the Caspian from the north, in particular as such species as Siberian white salmon (nelma), that became S. It fattens in the Caspian and makes regular migrations. In winter it is concentrated in the northern part, and in summer it moves to the southern part where the depths are greater and the water does not warm much in deeper layers. S. runs for spawning mostly to the Volga, sometimes into the Ural. It does not run either to the Kura or Terek. In the past, S. ran along the Volga as far as Uglich, along the Oka River as far as Ryazan and Kaluga, but the main spawning grounds were in the Ufa River.

At present, its river area is limited to the lower pool of the Volzhsky hydropower plant. S. reaches maturity in 6 or 7 years and during its whole lifetime it lays eggs no more than twice. The fish is large: its length is to 110 cm, its weight is up to 20 kg, and the average weight of females is up to 8.6 kg and males is up to 6 kg. S. is predatory fish and while in the sea it feeds extensively on small fish, such as herring, young sea roach, and bullheads. S. has a high nutritive value. It refers to fatty fish. The fat content reaches 17–20%. After regulation of the Volga flow, the S. population declined and is maintained only thanks to availability of small spawning grounds in the Ural River. S. has been put on the Red Book (Endangered) of the World Conservation Union.

Shelf (see Continental shelf) – sea-inundated part of the continental land (called also the continental shoal). The margins of the oceanic S. occur usually at a depth of about 200 m and more; the coastal part of the World Ocean. The Northern Caspian is located entirely on the S. with depths of no more than 10–20 m and averaging 4 or 5 m. In the Middle and Southern Caspian, the shelf along the western coast is narrow, but along the eastern coast it is wide and the depths may reach 100 m.

Shemaya – fish of the carp family.

Shevchenko – a city, see *Aktau*

Shevchenko (Aktau) Nuclear Power Plant (NPP) – On the basis of the NPP, the industrial installation for desalinization of the Caspian sea water for the water supply of Aktau, Kazakhstan was developed. In December 1999, an agreement was signed between Kazakhstan and the USA to close the nuclear reactor. Now NPP is closed.

Shikhan – an ice mound on a river bank or in the sea. The fishermen often say “shikhans are created,” meaning that a wind breaks the sea ice, piles it up and makes mounds.

“**Shilat**” (see Iranian Fishery Organization) – on the basis of the Treaty of 1927 granting the USSR the right to exploitation of the fish resources of the southern coast of the Caspian Sea that was concluded in Art. 14 of the 1921 RSFSR-Iranian Treaty, the first Soviet-Iranian Fishery Company “Shilat” was established. It existed as a joint economic venture until 1953.

Shipping Company – a commercial transport organization carrying passengers and freight over waterways. S.C. is responsible for their ships, timely delivery, and security of freight. In the former USSR, S.C. were organized based on geography for sea basins, sea coastal areas, river basins, etc.

Shirvan – a historical area in Azerbaijan extending between the Caspian coast and the lower reaches of the Kura River.

Shomal (Persian – “north”) – a name of the Iranian Caspian coast provinces comprising Gilan and Mazandaran. Sometimes it is called the “Caspian region.”

Shore – see *Sor*

Shore Ice – a strip of immovable ice frozen to the shore of a river, sea, etc. and separated from the rest of the ice field by a crack. In the Northern Caspian during warm winters, S.I. runs along the northern and eastern coast in a narrow strip for 30–50 km, and during severe winters nearly the whole area of the Northern Caspian is covered with ice to 1 m thick. The shore ice starts breaking in the late February to early March.

Shukhov Vladimir Grigorievich (1853–1939) – Soviet engineer, inventor, scientist, member of the Emperor’s Russian Technical Society (RTS), Honorary Member of the USSR Academy of Sciences (1929), and Hero of Labor (1932). He was the chief of construction of the Baku oil pipeline Balakhany-Cherny Gorod and the author of the project on construction of the Transcaucasian oil pipeline Baku-Batumi. In 1886, together with F.A. Inchik, he developed the continuous-action installation for oil refining, and in 1891 together with V.G. Gavrilov he proposed the world’s first installation for a petroleum cracking process which increased petrol outputs by 50%. He invented a nozzle for fuel oil burning and airlift. He designed

numerous constructions distinguished by boldness of ideas, innovation, and practicability. He is the author of hyperboloid towers (Shukhov's tower in Moscow 148.3 m high).

Shukhov V.G.
(<http://minkomsvjaz.ru/.cmsc/upload/images/20090319094217B.jpg>)



Shuraozen – a small river in piedmont Daghestan flowing into the Caspian Sea. In its upper reaches it is called Erneliozen. It originates on the northeastern slope of the Gimrinsky Ridge. Its length is 50 km, and it has a watershed area of 1,400 km². Its main tributaries are Kolkaozen, Akpeozen, Buraganozen, and Buglenozen. The Sarikhum dune is found in the S. basin. The climate in the S. basin is rather arid: 500–600 mm/annum of precipitation falls in the upper reaches, while only 300–400 mm/annum falls in the middle and lower reaches. It is recharged mostly by rainfall and meltwaters. Downstream of Erneli settlement the water is withdrawn for irrigation.

Signal, Shoal Bank – situated in the south of Astrakhan roads, 23 km east of Tyulenii Island. Discovered in 1937 by the hydrographic ship “Signal” and named after the ship that same year.

Siltation (syn. Warping) – process of isolation from the water of minute particles of suspended soil. Occurs as a result of reduced velocity of streamflow and decline of

streamflow suspending ability. Under unfavorable conditions, S. of water storages, canals, water areas, hydraulic structures, etc. results in a considerable reduction of the overall dimensions and carrying capacity and a dramatic deterioration of operating conditions. It is not uncommon that S. increases as a result of human activity (e.g. soil ablation from the fields, etc.). Combating S. is one of the primary tasks in designing, building, and operating canals (sea channels, irrigation canals, sometimes navigation canals), water areas of ports, and broadlands as well as hydraulic structures.

Sinee More (Blue Sea) – this way, the Caspian Sea used to be referred to in ancient Russian written monuments.

Single-Point Mooring – used for loading oil in tankers. An SPM is a round floating buoy secured to the seabed above the subsea oil pipeline. The oil is supplied to tankers via flexible floating hoses. The buoy may move vertically and horizontally and is capable of withstanding heavy seas and stormy winds. The floating SPM buoys are positioned at a considerable distance from the shore, which provides for their minimum impact on the environment, enables tankers to avoid calling at congested ports, and reduces the hazard of tankers being grounded. SPMs of the Caspian Pipeline Consortium (CPC) available around the port of Novorossiisk are capable of loading tankers at a rate of 12.7 thou m³/h. There are over 500 SPMs of various designs currently used worldwide.

Siyazan – (until 1954, Kyzyl–Burun Settlement) the central city of Siyazan District, Azerbaijan. It is situated in the Samur–Divichin Lowland and has a population of 34,500 (2009). There is a railway Station (Kyzyl–Burun). It also has oil production and a gasoline plant. The fish industry is developed here.

Smoking – using anticeptic and gustatory properties of smoke for fish treatment by methods of cold and hot S. Cold S. of fish lasts up to 5 days at smoke temperature not exceeding 40°C, while hot S. lasts up to 5 h at smoke temperatures of 90–100°C. Smoking uses dry firewood, shavings, and sawdust, preferably of hardwood tree species. Smoke yields “color” to the fish from golden to brown and a special taste and odor peculiar to smoked products only. Cold and hot S. are used for the treatment of herring, beluga, and sturgeon. Cold S. is only used in the treatment of inconnu. Hot S. is only used is used in the treatment of stellate sturgeon, starlet, and other species.

Society of Astrakhan Fish Industrialists – public body established early in the twentieth century to improve the Special Provisions. Proceeding from the principles of freedom of fishing, the S.A.F.I. delegates noted that “sea fishing can never and in no way should prevent fish from proceeding to the Volga arms.” S.A.F.I. actively advocated regulation of river fishing that hindered the passage of fish upstream for propagation.

Soil Salinization – accumulation in the soil of readily soluble salts in amounts toxic to plants as a result of excessive input of salts from ground or surface waters. Virtually all Circum-Caspian soils are more or less salinized.

Soimonov Fedor Ivanovich (1682–1780) – Russian hydrographer, geographer, and cartographer. Upon leaving the Moscow School of Navigation and Mathematical Sciences, he remained in Holland to practice marine sciences from 1711 to 1715. Then, from 1716 to 1718, he served on the Baltic Sea. From 1719 to 1720, in association with the Captain Lieutenant K. Van-Verden and Lieutenant V.A. Urusov, he participated in the expedition that described the southern and western shores of the Caspian Sea. On the strength of these materials and materials of the expedition of A. Bekovich-Cherkassky, S. and Van-Verden drew the “Flat Picture of the Caspian Sea” of which, for the first time, a relatively correct outline of the entire shoreline was presented, though the eastern shore had substantial distortions. Therefore, when in 1723 the greater part of the Caspian shore was annexed to Russia, S. again traveled along these shores and described them. As a result, in 1731, an atlas of eight maps was published, titled “Description of the Caspian Sea with its General Map and Atlases of Specific Maps.” In 1738, S. published an Atlas of the Baltic Sea, and in 1740, by Biron’s order, he was arrested as an accessory of A.I. Volynsky and sentenced to capital punishment, which the empress Anna Ivanovna reduced to exile to



Soimonov F.I. (http://dic.academic.ru/pictures/enc_biography/m_25070.jpg)

Okhotsk, where S. explored the Circum-Amur area, studied nature, economy, and culture. In 1763, S.'s work, "Description of the Caspian Sea . . ." (with G. Miller's additions) was published. The book contained a hydrographic characterization of the sea and descriptions of nature and economic activity of the population of the adjacent areas. In 1757, he was appointed the Governor of Siberia. In this position, S. assisted numerous expeditions aimed at studying Siberia and the Pacific Ocean. In 1766, S. resigned. A bight in Turkmenbashi (Krasnovodsk) Bay is named after S. as well as a mountain, the most prominent of the Shahadam Mountains (216 m), near the southwestern outskirts of Turkmenbashi City.

Sopka Gryazevaya (Mud Cone) – mud volcano of a very small size. The shape of S.G. depends on how thick the exuded mud is; when volcano mud is very liquid, a cone may fail to take shape as the mud will spread over the ground surface. Gases that emanate from S.G. are primarily hydrocarbon (methane prevails), but they also contain carbon dioxide (CO₂) and sometimes carbon oxide (CO) and nitrogen (N₂) in small quantities. The cone waters and mud contain iodide (I) and bromine (Br). Gas composition in the cones is not uniform.

Sor – a saline shallow lake that dries out in summer and turns fully or partially to solonchak–sor Dead Kultuk; thin solonchak (Kazakh); depression elongated latitudinally, several hundred meters to 1–2 km in length, with a width from tens to hundreds of meters and up to 5–7 m deep. S. are filled with lake and lacustrine–alluvial muddy deposits. Above they are covered with a thin salt crust resting upon batkac (black saline silt), with a thickness upward of 10–20 cm. S. may be arranged in chains. They are featured on the Caspian seashore, especially around Ryn–Peski (Ryn Sands).

South-Caspian Institution for Environmental Services – located in Tonekabon, Mazandaran Province, Iran.

South-Caspian Lowland – sometimes referred to as the Coastal lowland, this is a plain in the north of Iran near the southern coast of the Caspian Sea. Its length is about 500 km, its width is 2–6 km, and in the river delta it is up to 30–40 km. Oil deposits are found here. The climate in this area is humid subtropical with precipitations over 1,000 mm/annum, the maximums being observed in autumn and spring. The mean temperature in January varies from 6 to 8°C, while in July it is from 25 to 27°C. There are areas covered with forests (alder, oak, sing nut). This is one of the most important agricultural regions in Iran, growing rice, tea, orchards, and citrus. The major cities are Rasht, Sari, and Bandar-Anzali.

South-Caspian Oil-Gas Province – tectonically it covers the areas of the recent Alpine sags of the Cenozoic Time. It extends over a vast territory of more than 200 thou km². In the northwest it is confined by the Kubadag and Greater Balkhan Mountains, in the east by the piedmonts of the Western Kopetdag, in the west by the mountain systems of the Greater and Lesser Caucasus, and in the south by the Elburz. The central part of the province comprises the deep depression in the

Southern Caspian. In the east is the West-Turkmenian depression, while in the west is the Kura intermountain trough. The thickness of the sedimentary material in the may reach 20 thou m, of which more than the half are Neoquaternary formations. According to geological data, the thick sedimentary cover occurs directly over the basalt layer. Well-known oil and gas fields are found within this province, including the Azerbaijanian and West-Turkmenian.

Southeast Caspian Roach or Turkmen Roach (*Rutilus rutilus caspicus natio knipowitschi Pravdin*) – anadromous fish, inhabits the southeastern part of the Caspian Sea, in the area of Iranian and Turkmen coastal waters, in the north reaching Krasnovodsk (Turkmenbashi) Bay and even extending as far as Bekdash District to the north. Its length is from 9.5 to 32 cm, its mass is from 150 to 750 g, and its length of life is 8–9 years. Spawning commences in February, and mass spawning is in March at water temperature of 15–18°C. The spawning grounds are in the broad floods of the Atrek River lower reach. The spawning efficiency depends on the rate of the Atrek River flow. With low discharge of the river and insufficient flooding of the floodplain water bodies, the population of a new generation may be insignificant; the size of breed is also impacted by sharp variations of the water level during the spawning period, fish egg, and young fish development. An important commercial fish species of the Southeastern Caspian Sea.

Southeastern Kultuk, Bay – juts into the shore to the west of the southeastern terminus of the Kura River delta, Azerbaijan. The bay is a shoal, its depth being mostly under 5 m. The northeastern and northern shores of the bay are lowland, covered with high grass; the western shore is sandy and somewhat elevated.

Southern Apsheron Bay – located to the south of the jetty linking the Apsheron Peninsula with the Artyom Island, Azerbaijan. The bay is not large and not deep. There are several berths for boats.

Southern Caspian – has an area of about 150 thou km², with a volume of water 51.4 thou km³ and a water level at –27.0 m. This is the deepest part of the Caspian Sea with the average depth of 345 m and the maximum equaling 1,025 m. Intensive sagging of this region in the Pliocene-Quaternary Period and neotectonic dislocations resulted in shaping of the heavily broken tectonic relief, which is complicated by mud volcanoes. Most easily detectable are the shelf area, especially in the east, the typical continental slope, and the bottom of the deep South-Caspian Hollow. The most complicated bottom relief is observed in the northwest of S.C., where a series of underwater ridges with a relative height to 500 m extends. The islands and shoalbanks of S.C. are found nearby. The underwater ridges of S.C. gradually pass into the flatter, Pre-Iranian Hollow.

Southern Cheleken Bay – name for the northern part of Turkmen Bay. It is limited by the Dervish Peninsula, the Southern Cheleken Spit, and the northern coast of the Cheleken Peninsula.

Southern Cheleken Spit – a narrow sand tip of the Dervish Peninsula in the Turkmen Bay of the Caspian Sea, Turkmenistan. It projects for 15–16 km from the tip of the Cheleken Peninsula and has an irregular form that is wide at the base and the top but narrow at its center. Due to the currents bringing bottom sands, the spit is constantly growing southwards. Low sandy mounds may be found on its surface.

Southern Federal District – initially called the North-Caucasus District, this was one of seven Federal Districts formed in Russian Federation pursuant to Presidential Order No. 849 of May 13, 2000. On January 19, 2010 the North-Caucasus District (NCD) was detached from the SFD. Now SFD includes the territories of the Republics of Adygeya and Kalmykia, Astrakhan, Volgograd, Rostov Regions, and Krasnodar Territory. The center is Rostov-on-Don. NCD includes Republics of Dagestan, Ingushetiya, Kabardino-Balkaria, Karachaevo-Cherkesskaya, North Ossetia-Alaniya, Chechnya, and Stavropol Territory. The center is Pyatigorsk.

Southwestern Turkmenistan (Pre-Caspian) – located at elevations from –27 to +100 –150 m, it has numerous lowlands with diverse natural conditions enclosed by the Caspian shore to the west, the Greater and Lesser Balkhan Mountains in the north, the Kopetdag offspurs in the east, and the Atrek valley in the south. In general, it is a flat, slightly seaward inclined plain with considerable masses of Coastal Kyzylkums and Seyunagsak sands. It is composed mostly of Tertiary and Quaternary marine deposits with a total thickness to 5–6 km, while in its eastern part, the near mountains are composed of alluvial-proluvial sediments. Such great thickness of sediments may be explained by the fact that S.T. is located within the vast South Caspian tectonic depression that had been subject to long-term subsidence.

The modern relief of S.T. was formed mostly in the late Pleistocene and Holocene, and the key factor here was the exogenous process that resulted in formation of alluvial plains of different ages, proluvial sloping foothill plains, marine flat solonchak surfaces, natural sandy-pebble levees, sand spits and lows, and eolian sand massifs with the heavily broken relief.

In terms of relief, S.T. may be divided into 2 parts – northern and southern. The northern smaller part is located in the zone of Pre-Balkhansky tectonic uplifts and Kyzylkym sag. It includes foothill plains of the Greater and Lesser Balkhans; the lower reaches of Uzboi, Kelkor solonchaks and other solonchak depressions filled from time to time with the waters of the Uzboi and Caspian; the Aktale riverbed that in the past was a strait between the Caspian Sea and Kelkor; Balkhansky Solonchak that outcropped in the 1930s during the Caspian water recession; the heavily rugged sands of the Dardjo-Dardjakumy Peninsula; Cheleken Peninsula that only in the 1930s got connected with the mainland; the Coastal Kyzylkum sands that formed as a result of re-deposition of alluvial sediments of the pra-Amudarya; and Boyadag-Gyaurilinsky solonchak with the Gyaurli dry bed. Rich gas reserves and some other natural deposits were found in this territory.

In the southern part are distinguished piedmonts of the western Kopetdag; foothill proluvial plains of the Western Kopetdag; Meshedkumy and Masha sands;

Seyunagsak ridge sands; maritime solonchak lowland; a system of ancient low-water and modern deltaic plains; and the Atrek Valley among which are modern Gasan-Kuli, recent Karadjibatyrsky, ancient deltaic Misriansky and Chatsky plains are the largest by the territory.

Souyutkina Spit, Cape – juts out away from the shore, 44 km to the northwest of the northwestern tip of Chechen Island. The cape is low-lying.

Spawning – period of fish spawning

Spawning Ground – spawning site of fishes.

Spawning Grounds Floating – man-made SGF of vegetative or synthetic materials for some ordinary fish.

Spearing – a winter ice fishing season beginning between December 10 and ending January 5 near Uralsk City. This is fishing of salmon with pike poles.

Special Provision – law of the Russian Empire (1803–1865) regulating fishing in the Caspian Sea and defining sea waters as State property. In the original wording, the law complied with the fundamentals of the ancient law on the freedom of sea fishing. In 1806, the Senate passed a resolution on prior rights of paid fishing in the coastal waters by the owners of land allotments adjoining such waters. In 1865, after the Regulations of Caspian Fish and Seal Hunting were passed, SP was abrogated.

Special Representative of the RF President on Matters of Caspian Sea Status Regulation – the position instituted by a decree of the RF President in 2000. V.I. Kaluzhny was the first special representative in the rank of a Deputy Foreign Minister. Similar positions were instituted in other Caspian states, too. In October, 2004, A.V.Golovin, Ambassador at Large of the RF Ministry of Foreign Affairs was appointed the Chief of special working group (i.e. the representation level was lowered).

Special Working Group (SWG) at the Level of Deputy Foreign Ministers of the Caspian States – set up in 1996 as a negotiation vehicle at the meeting of foreign ministers of five Caspian states in Ashkhabad, Turkmenistan. The primary object of the group is the elaboration of the Convention on the legal status of the Caspian Sea. From 1996 to 2009, the following SWG meetings were held: Alma-Ata, Kazakhstan, 22–23 May, 1997; Moscow, Russia, December of 1998; Tehran, Iran, February of 2001; Baku, Azerbaijan, June of 2001; Astana, Kazakhstan, September of 2001; Moscow, January of 2002; Ashkhabad, Turkmenistan, April of 2002 (extraordinary); Tehran, Iran, July of 2002; Baku, February of 2003; Moscow, July of 2003; Ashkhabad, September of 2003; Tehran, December of 2003; Baku, March of 2004; Astana, July, 2004; Moscow, October, 2004; Ashkhabad, January, 2005; Tehran, May, 2005; Baku, October, 2005; Astana, November, 2005; Moscow, March, 2006; Ashkhabad, April, 2007; Tehran, April, 2008; Baku, September, 2008; Astana, December, 2008; Moscow, April, 2009.

Stake Net – a common single-thickness small-meshed net (36–39 mm) put out in the sea at right angles to the shoal banks opposite the bay or river mouth exits. S.N. are set in groups usually of 100 nets at a length of up to 3.5 km.

Statute of the Caspian Fishery and Seal Hunting – approved in 1865 by Imperial Ruling. The draft statute was submitted by K.M. Baer in 1857 to the Emperor's Academy of Sciences. After its publication in the same year, there were proposals on its amending, addition, and revision. It stated norms for the Department of Caspian Fishery and Seal Hunting. It instituted the Board (Department) of Caspian Fishery and Seal Hunting and the Committee of Caspian Fishery and Seal Hunting and outlined the scope of their activities and structures. A special Fishery Police was established to control implementation of the Statute. It also envisaged permanent improvement of the fishing rules, management, and supervision.

Stellate Sturgeon, North Caspian Stellate Sturgeon (*Acipenser stellatus*) – a species of sturgeons that has winter and summer forms. It enters the Volga from the North Caspian, with its main spawning grounds which were up to Volgograd; many species used to arrive for spawning even farther upstream (largely upstream of Saratov before Volga damming). In fewer numbers in recent years, the fish enter the Ural River with sporadic specimens entering the Terek, Samur, and Sulak Rivers. From the rivers of the South Caspian, S.S. enters mostly the Kura River, Lenkoranka River, and Astara River. Along the Iranian coast, S.S. enters the same rivers that sturgeon does (Sefid Rud and others).

The bulk of Volga stellate sturgeon matures at the age 9–12 years (males) and 11–15 years (females). Male Kura stellate sturgeon mature at 11–13 years, while females mature at 14–17 years. Males in the Ural River mature at 7–8 years, while females mature at 13–14 years. In the Sefid Rud, males mature at 13–14 years, and females mature at 16–17 years. The lifetime of all is under 30 years. S.S. feeds on invertebrates (crustaceans, worms) and fishes (gobies, herrings, and kilkas). Their mean weight at recruitment of Volga S.S. is 8–9 kg, of Kura S.S. is 7–8 kg, of Ural S.S. is 5–10 kg. Maximum weight recorded for the Kura River S.S. is 70 kg.

Crossbreeds of stellate sturgeon with starlet and barbell sturgeon are known. Breeders have succeeded in obtaining viable hybrids: starlet (x) stellate sturgeon and stellate sturgeon (x) starlet.

Sterlet (*Acipenser ruthenus*) – the smallest and only representative of the sturgeons family in the rivers flowing into the Caspian Sea. It lives in the Volga and its tributaries all the time and is occasionally encountered near the Caspian western shore, whence random specimens enter the Kura River. Blunt-nosed (winter) S. is encountered in the Volga more often than the sharp-nosed. Normal weight and length of commercial S. are 0.5–2 kg and 30–65 cm; seldom are they found greater than 3–4 kg and 80–90 cm; 6–8 kg is exceptional. Sexual maturity of males is usually at 3–7 years (largely, at 4–5), while females mature at 5–12 years (largely at 7–9) when they reach the length of 28–34 cm. They propagate in May–June and have a fat content of 6%.

Stellate sturgeon
(<http://www.lagrandecuccia.it/articoli/redlist/storione%20stellato.png>)



S. spawns in 1–2 years. Males on the Volga become sexually mature at age 3 years, females spawn in the 6th year. The Volga features winter and summer races. They feed on invertebrates, mostly the larvae of insects that sit on submerged snags.

S. is a valuable fish, and is easily cross-bred with the Russian sturgeon and stellate sturgeon.

On the Volga, thanks to artificial insemination, viable hybrids sturgeon (x) *S.* and *S.* (x) sturgeon have been developed.

S. fish soup is known just as well as Russian black caviar. The Saratov Oblast arms exhibit three small *S.* fishes.



Sterlet (<http://moscow-fish.com/wp-content/uploads/2007/11/sterl.jpg>)

Storage Reservoir – a man-made water body formed by water-retaining structures to collect and store the water running off the catchment area. SRs are set up by building a dam, a cofferdam in the river channel, or in a natural depression, by soil excavation and suchlike measures. The purpose of a SR is artificial redistribution of the flow: retaining water during the period of large discharges (largely, discharges of a spring flood) and uniform water-use for the rest of the year, which makes it possible to increase flow rates during low-water periods. Major SRs on the Volga, Kama, and other rivers are of integrated nature: flow regulated by them is used for hydropower generation, increased low-water discharges, and greater navigation depths downstream of the SR dam, also for the purposes of irrigation, water encroachment, etc. SRs on small rivers are mainly used for power engineering development, irrigation, water encroachment, water supply and, at times, to improve navigation.

Strabon (64/63, B.C.E.–23/24 C.E.) – (Gr. *strabon* – *squint-eyed*) ancient Greek historian and geographer from Pontian Amacia. Made several journeys in Minor Asia, Greece (Corinth), and several times to Italy (Rome, Etruria, Campagna) and Egypt (circa 25–24 B.C.E.), where he traveled up the Nile River to Siena and Phily Island on the border with Nubia. He is the author of the big work “Geography” in 17 books which remain available almost in full to this day. It is noteworthy that most data of the lands he was aware of S. borrowed from numerous sources, including Eratosphe, Polybius, Posydonius, and Artemidor of Ethes.

By the time of S., the Caspian Sea had come to be regarded by ancient Greeks as Hircanian Bay of the Ocean. S. writes: “the Caspian Sea is a bay jutting out southward from the Ocean. At first the bay is rather narrow, but then, as it extends deeper into hinterland (to the south), it widens, especially in its most hinterland part even up to 5,000 stadias of width. As for navigation in this hinterland part, it is likely to be even a little longer, nearly reaching uninhabitable lands.” S. relates anonymously about the discovery of oily (possibly, petroleum) sources in the Caspian Sea area: “They say that diggers found oily sources near the Okha River. Indeed, if there are alkaline, asphalt, sticky, sulfurous waters in this country, then there must be oily sources, too.” The “Geography” of S. is the result of geographical knowledge of antiquity and is a treasury of information on ancient geography.

Strong Salting – fish salting in strong brine.

Stroug – ancient vessel that plied the waters of the Volga and Caspian Sea. S. used to be built in Nizhny Novgorod and Kazan. The base of S. was a hollowed out tree trunk (stroug pipe), though more often than not, it was basswood. Then casings (i.e. long boards) were fitted to the sides with clamps, 2–3 boards on each side. Usually, S. was 10–20 m long and 2–3 m wide. S. had a sculling oar that served as a rudder and several stroke-oars (from 6 to 20). As time went on, the size of S. increased

notably. According to Olearius, in 1636, cargo S. were capable of lifting 600–800 t and even up to 1,000 t. Besides cargo S., there were passenger S.



Stroug (http://farm1.static.flickr.com/48/136436812_3ec11ce66b.jpg?v=0)

Sturgeon, Russian Sturgeon (*Acipenser gueldenstaedti* Brandt) – spindle-shaped with a dark body that often has a yellowish tinge. There are diadromous and resident varieties. The diadromous form has winter and summer runs. Migrations of S. in the sea are determined by the temperature regime and distribution of food organisms. In the Caspian, the most numerous is the Volga stock. For spawning, S. mainly enters the Volga from the Caspian, while very small numbers enter the Terek, Sulak, and Samur Rivers. Along the Iranian coast, S. enters the Sefid Rud River, once in a while entering the Gorgan, Babol, and other rivers.

S. enters the Volga almost throughout the year, but maximum numbers migrate from June to August (winter S.). Migration of lasts all summer long and continues into the early autumn. In spring (April and May), S. hardly ever enters the Volga (summer S.). Summer S. winters in the river. The fishes that migrate in spring propagate the same year. They go up the river at an average speed of 7.5 km/day. While moving up the river, S. stick to bottom waters.

The times of S. migration into the Ural River have much in common with the times of the fish run into the Volga, but unlike the Volga, the number of migrating fish in the Ural is small. Migration begins early in April and ends in October and November. The fish, entering the Ural in summer and autumn, winter in the pits.

A small number of *S.* enter the Terek in spring, summer, and autumn, the peak of entry being in July, August, and September. Very few sturgeons enter the Sulak, where they meet with Persian *S.*, also a South-Caspian subspecies of a typical form, which is observed from April to August.

S. is one of the Caspian's large fishes. Individuals are as long as 200–210 cm with a mass of 60–65 kg do occur, albeit seldom. In the North Caspian, where grown-up and immature individuals are fattened, they catch both very small and quite large *S.* ranging in length from 16 to 185 cm, and in mass from 50 g to 35 kg. The average individual is 36 to 150 cm in length and 3 to 15 kg. The body length of 2-year old *S.* equals 30 cm, and its mass is 150 g. The length of 7 year old individuals averages 73 cm, with a mass of 2.8 kg; 15 year olds reach 105.7 cm and 10 kg, and 20 year olds average 124.7 cm and 15.8 kg.

S. is a long-living fish with a maximum age of apparently 45–50 years. Sexual maturity of the Volga male *S.* is not until after they are 8–9 years old, while females do not mature until the age of 10–12 years (the Kura *S.* are 13–14 years are 19–30 years, respectively). The mean commercial weight of the Volga *S.* is 12–16 kg, while the Kura *S.* is 22–24 kg. The breeding power of *S.* is from 50 to 600 thou fish eggs in the Volga and from 80 to 500 thou fish eggs in the Terek; in the case of very large females, the number of fish eggs can reach 1 million.

The major *S.* spawning ground in the Volga is at Volgograd, in the dam zone along the right bank. On the Akhtuba River, *S.* spawn in the upstream segment of the river as far as Kapustin Yar settlement. Spawning occurs early or in mid-May at water temperatures of 8–15°C. *S.* lays eggs at depths of 3–10 m, mainly in river segments occasionally inundated with spring floods. It takes fertilized fish eggs 10 days to develop. The larvae are taken down by the flow. They arrive in the delta in June, and the peak run to the sea is observed in July, the run ending in August.

On the Ural River, *S.* lays fish eggs in river segments at a distance of 65–100 km from the mouth. In the downstream segment, fish eggs are laid by *S.* that entered the river in spring. *S.* of summer and autumn run that wintered in the river spawn in areas considerably distanced from the mouth. Spawning occurs in May and June at water temperature of 8–18°C. Sea run of larvae and juvenile fishes takes place in May, June, and July. On the Terek River, the main spawning grounds of *S.* are between Kizlar and Galyugaevskaya Cossack village at a distance of up to 350 km from the mouth. The bottom of the spawning grounds is covered with pebbles, flow velocity ranging from 1.2 to 1.8 m/s. Spawning is observed from early April to late May at water temperature of 8–18°C. The larvae roll down the flow and already in a few days arrive in the river mouth segment.

In the Caspian Sea, *S.* at an early age feeds on invertebrates. As it comes of age (by the age of 2, when its body length is around 30 cm), *S.* starts eating mollusks and fishes (gobies, herrings, kilkas, bighead gobies, atherinas). In natural conditions, *S.* produces mixed breeds with beluga, stellate sturgeon, barbell sturgeon, and starlet.

S. is a very valuable commercial fish. In spring, fat content in *S.* body reaches 12–15%; in caviar fat is 14%. *S.* reserves are maintained by artificial fish farming.



Sturgeon (http://www.darwin.museum.ru/expos/floor3/Moscow/img/osetr_b.jpg) (=sturgeon-1.tiff)

Sturgeons (*Acipenseridae*) – fish family of the ganoids (Ganoidei) order (according to a different classification, subclass), of suborder *Chondrostei*. There are anadromous, semi-anadromous, and fresh-water fish. S. inhabit the waters of the Northern Hemisphere: Europe, North Asia, and North America. Twenty-five species are found: beluga, Russian sturgeon, sterlet, barbel sturgeon, North Caspian stellate sturgeon, Persian sturgeon, South Kura stellate sturgeon and allied species, shovel-noses, and pseudo-shovel-noses. Two species, sturgeon and stellate sturgeon, are most numerous. Beluga population is much less considerable in number, and reserves of sterlet and barbel sturgeon are extremely low. The Caspian Sea ranks first in the world in terms of species diversity, sturgeon population, and sturgeon yields. S. (besides sterlet) are long-living fish. S. (except sterlet) does not spawn each year. Spring-summer spawning occurs in the rivers (S. do not propagate in sea water). Usually, juvenile fish of the current year run into the sea the same summer. Sturgeons fatten to sexual maturity at sea. The Caspian is a peculiar vast natural nursery for all S. age groups.

S. taxonomy: class *Actinopterygii*, order *Acipenseriformes*, family *Acipenseridae*. *Russian sturgeon* (sturgeon caviar) – species *Acipenser gueldnstaedti*; Brandt, 1833. *Beluga* (caviar of great white sturgeon) – species *Huso huso*; Linnaeus, 1758. *Stellate sturgeon* (caviar of stellate sturgeon) – species *Acipenser stellatus*; Pallas, 1771.

The main S. habitats in Russia are the Volga-Caspian, Azov, Amur, and Ob Basins. 11 species of S. are encountered, 3 of which (Baikal, Sakhalin, and Atlantic) are entered in the RF Red Data Book and are excluded from commercialization.

Substeppe Ilmens – lakes in the steppe, far away from the main channel of the river, inundated during a flood or as a result of wind-induced upsurges from the sea. They are water-filled all year round and adjoin the Volga delta from the west and east (ilmen-mound areas). The area of the western ilmen-mound equals 5.9 thou km², while the eastern one is 2.6 thou km². Freshwater, brackish, and heavily-saline lakes are found here. The characteristic feature of the landscape of these areas is the ridges

of low hills aligned parallel to one another, called “Baer’s hills.” An ilmen-mound reserve was set up in Ikryaninsk District of Astrakhan Region in 1995–1996.

Substitution Principle, “Swap” (from English “swap,” meaning replacement, exchange) – adequate exchange of oil products supply among countries and regions that have no possibility of direct export to the world markets and the countries and regions that have such possibility. In the 1990s, this principle was used to deliver oil and gas from Iran to foreign markets via the Persian Gulf in volumes adequate to the amounts of oil and gas supplied by Kazakhstan and Turkmenistan to the northern regions of Iran.

Sulak – river in Daghestan (Avar. “flowing together” – confluence of two Koisu Rivers; another version: there lived the tribes of Leks (Laks, Legs) on the Sulark River. Hence: *Sulak – water of Laks, Lazhskaya water*). Produced as a result of confluence of Andi Koisu and Avar Koisu, originating in the glaciers of the Greater Caucasus Mountain Range. Length of S. after confluence – 170 km. Catchment area 15,200 km². S. basin includes 2,430 rivers of combined length 13,500 km. In its upper reaches, S. flows in a deep narrow valley cutting through the thick wall of the Salatau–Gimrin Mountain Range; having left the mountains, S. falls into arms and flows over Terek–Sulak Lowland. River reaches the Caspian Sea, forming a delta. Feeding is mixed. The waters are rather turbid (2,880 g/m³). Regime-wise, belongs to the rivers of North–Caucasus type, with a flood during the warm season of the year. The mean annual runoff equals 4.0 km³/annum. Sediment runoff is 1.6 million tons. After the construction of Chirkei Storage Reservoir (storage capacity 101.5 million cubic meter), discharges declined somewhat, sedimentation and water turbidity decreased. The river delta area is around 70 km². The waters are used for irrigation. S. has large hydroenergy reserves: a chain of hydropower plants is built in the basin: Gergebil, Chirkei (largest in the North Caucasus), Miatlin, Chiryurt, Irganai; design are available for 3 more hydroelectric plants (HEP) and 11 HEP are in the projects. The largest irrigation canal providing water for the extensive lands of Terek–Sulak Lowland is the October Revolution Canal built in 1930 from S. to Makhachkala City. Its waters are also used for water supply (Vuzovskoe Lake–Storage Reservoir – length 1,200 m, width – 200 m, depth 15–20 m) and for fish–farming (Akkol Lake, and other water bodies).

Sulak – formerly, Vill. Khizroevka, from 1949 – urban village in Daghestan, in the delta of the Sulak River, 1.5 km west of the Caspian seashore. Near to Sulak bight, on the high floodplain terrace and delta plain. Urban village area 105 ha with a population of 6.8 thou people (2009). Large fishing unit with a fish canning factory, fish smoking and freezing plant. It is a zone of high seismicity and flooding hazard due to Caspian Sea level rise.

Sulak Plain (Lowland) – located to the south of the Sulak River and extending to the piedmonts and the south of Makhachkala before passing into the Maritime Plain. The Sulak dry channels in the western and central parts of S.P. merge

with the depressions of residual lakes or sandy hills. The depressions are composed of alluvial deposits of different textures and ages, and the greater part of S.P. is composed of loams and clays. Along the Sulak, sandy-pebble deposits are widespread. Considerable terrain in the central and eastern parts of the plain is waterlogged and overgrown with reeds. The sandy mountain, Dune Sarikhum, rises in the southwestern part of S.P.

Sulak Plavni – waterlogged terrain in the lower reaches of the Sulak River and extending eastward of Nechaevka village as far as the Caspian Sea. Here, rather large bogs Bakas and Nechaevskoye are formed.

Sulak River Delta – the delta area is a flat aggraded plain of the maritime part of the Terek-Sulak Lowland, Daghestan, with absolute height elevations of $-24.0 \sim -26.0$ m. Judging by relief, this is an extensively aggraded cone of the old delta of the Sulak River. The climate is semi-arid, with precipitation around 320 mm/annum, spring seeing the maximum. The soils on the lower elements of relief are alluvial, meadow, and marsh, on elevated segments – brown, semi-desert, saline, and solonets. The SRD land area is around 70 km², and the area of the existing Sulak delta offshore is small. The existing SRD began to take shape around 200 years ago. Sedimentation in the Sulak River channel is heavy, and the river channel changes its outline all the time, moving in a northeastern direction. At present, SRD is an alluvial projection jutting out into the Caspian Sea, separated from the bedrock coast by the Sulak Inlet. From the river mouth, spits stretch in a northeastern direction to a distance of 8 km and in a southeastern direction to a distance of almost 4 km.

Sumgait, Sumgayit – (Turk. *water coming back* – in summer, goes dry) second, in terms of industrial potential, city in Azerbaijan. The name is from the location of the village on the Sumgait River, for which a settlement that in 1949 was grouped with cities of republican significance. Situated on the northern shore of Apsheron Peninsula, 5 km from railway station Sumgait and 35 km from the City of Baku. Population is 406 thou (2008). The construction began in 1939, but was interrupted by the war. In 1944, the construction was resumed in connection with the development of iron-and-steel and chemical industry. It has 115 industrial enterprises and plants, including: pipe production, aluminum, chemical, superphosphate, glass-manufacturing, synthetic rubber, drilling pipe, brick works, electric heater, chlorocarbon products, organic products, compressor, detergents factory, and others.

Summits of the Caspian States Presidents – the first was in April, 2002 in Ashkhabad, Turkmenistan; the second – in October 2007 in Tehran, Iran; the third was held in September 2009 in Aktau, Kazakhstan.

Surakhany – balneal health resort in Azerbaijan. Urban village 18 km from the center of Baku. Part of the Apsheron group of health resorts. The main curative is sulfide chloride sodium waters (with up to 150 mg/l hydrogen sulfide), potassium and magnesium as well as the water of mineral springs existing around Surakhany oil-producing fields. The temperature of the water is 18–25°C, with salinity under 24 g/l; its yield of springs is over 5,000 m³/day. The waters are used mainly for the

baths. Health value of the springs were known to the local population that has used the waters for the baths since the seventeenth century. Balneotherapeutic development of the springs began in 1895, and examination of chemical composition and healing effect of the waters commenced in 1928. It is a Balneary for people having locomotor organs diseases and diseases of the peripheral nervous system.

Sustainability of Reserves – the ratio of newly-explored reserves of hydrocarbon materials to the volumes of recovery.

Svinoy Island – part of Baku Archipelago, situated 16.5 km from Cape Pirsagat, Azerbaijan. It is oval-shaped and stretches in a northwest–southeast direction. The length of the island together with the spit is 1.3 km, and its width is 0.9 km. The middle part of the island is elevated (maximum height 23 m). The island is an intact segment of a former mud volcano.

Swap, Swap Terms – see *Substitution Principle*

System of Monitoring – integrated system of observations, data processing, and data use for diagnosing and forecasting environmental changes under the impact of exogenous factors, both natural and anthropogenic, as well as for elaboration of recommendations and decisions for mitigation of negative consequences of these changes. The riparian Caspian states signed the Framework Convention for the Protection of the Marine Environment of the Caspian Sea (November 4, 2003 in Tehran).

T

Tabaristan – name of the Caspian Sea southern shore in the tenth to twelfth centuries.

Tabaristan Sea – see *Caspian Sea, Names*

Tabasarans, Tabasaranians – (self-name *Tabasarans*) people in the Russian Federation (132 thou people in 2002), in the Daghestan Republic (110 thou people), and elsewhere. Their language is Tabasaranian of the Lezgin group of the Daghestan branch of the Iberian-Caucasian languages. Their religion is Sunni-muslims, and their main occupation is agriculture and animal husbandry (sheep-raising). They are also known for carpet weaving.

Tagiev Gaji Zeinalabdin (1823–1924) – active councilor of state, commercial counselor, and hereditary honorary citizen, he was born in Baku to a poor family and received no education, but he worked hard to attain the position of a construction foreman. He worked as a brick mason then took up construction work under contracts. He made a big fortune in the oil industry. T. built a shipyard on the Caspian shore and an oil refinery of his own, and he also ordered barges and tug-boats for transporting oil up the Volga River. In 1872, he established the “G.Z. Tagiev” firm, which became a diversified company. His major oil industry enterprises ranked 4th in terms of output after the firms “Nobel Brothers,” “Rothschild,” and “Caucasian Partnership.” Having sold his oil company (for Rbls. 5 million in gold) to the British in 1898, T. launched a weaving factory with 4,000 hands, having spent Rbls. 5.5 million to purchase equipment for it. He owned 18 steamboats that plied the waters of the Caspian Sea, and in 1909 acquired government fisheries by tender, with a rent expenditure of Rbls. 750 thou, though he spent an additional Rbls. 500 thou to enlarge the fisheries. In 1910, he completed the construction in Baku of one of a large flour drum mills and of a theater. T. was on the governing boards of the Baku Merchant Bank and four major companies and was a member of numerous charities. He donated Rbls. 150 thou to the Empress Alexandra Fedorovna Russian-Muslim Special School, and Rbls. 100 thou for to build the Baku Secondary Technical School (see Oil Barons). When the Bolsheviks took power, T. was prosecuted, but he stayed in Baku, where he died.

Talgi – balneal health resort 18 km southwest of Makhachkala and 12 km from the railway station Novy Khushtet in Daghestan. It is situated in Talgi Valley, at the eastern foot of Mt. Kukurt-Bash of the Greater Caucasus Mountain Range, at a height of 240 m. Across the territory of the health resort flows the Cherkesozen River, which flows into the Caspian Sea. Its vegetation consists of ornamental plantations. The main natural curative factor of the resort is thermal (up to 31°C), sulfide (from 300 to 650 mg/l of hydrogen sulfide) and carbonic acid waters (up to 820 mg/l of carbonic acid), chloride calcium – sodium waters (mineralization 5.3–5.8 g/l), which is brought to the surface by drilling on the eastern slope of Mt. Kukurt-Bash to a depth of 220–380 m. These waters are used primarily for the baths and for the treatment of diseases of locomotor organs, of the nervous system, skin, and gynaecopathy. It has a sanatorium, balneotherapeutic facility, and aero-solarium.

Talysh Khanate – state on the southwestern shore of the Caspian Sea that came into being in the eighteenth century. Its center is Lenkoran. After 1813, it was part of the Russian Empire.

Talyshes – (selfname *tolyshon*) people living in the extreme southeast of the Azerbaijan Republic (77 thou people in 1999) and in Iran's province Iranian Azerbaijan (112 thou people). Their language is Talysh, of the Iranian group of the Indo-European language family. Nearly all T. are bilingual: they speak Talysh and Azerbaijani. Their religion is Sunni-Muslims and Shiite-Muslims, and they pursue cultivation of citrus cultures, tea-leaf, rice, and wheat. Iranian T. also practice stock-raising, and even adhere to a semi-nomadic lifestyle.

Talyshskie, Talysh, Talyshinskie Mountains – situated in the southeast of the Caucasus in the Azerbaijan Republic along the border with Iran, these are a continuation of the Small Caucasus Mountains. Made up of three longitudinal ranges: the Main Dividing Ridge, Peshtasar, and Burovar Ridges. Their height is under 2,477 m (Mt. Kyumyurkei), and this is very seismic activity area. The slopes are covered with subtropical forests of Hircanian type (oak, elm Zelkova, agan tree, beech), and the ridges are covered by mountain xerophytes and mountain grassland steppes.

Tamchi – scanty spring, low-yield source (Turk.); T. are common in Ustyurt near the eastern shore of Kara-Bogaz-Gol Bay and on Mangyshlak Peninsula.

Tanker (Engl. *tanker*, from *tank* – cistern, container, reservoir) – ship for transporting in bulk (tanks) liquid and semi-liquid cargoes (oil, benzene, spirit, lube oils and edible oils, wine, chemicals, bitumen, liquefied gases, etc.). A tanker is loaded over a special conduit; off-loading is done by pumps on the ship. Tanker tonnage is up to 500 thou t. T. are widely used in the Caspian Sea.

Tapuristan – ancient name of the southern shore of the Caspian Sea within Iran. The name comes from the ancient people *Tapuri* (*tepur*; *teber*) that used to live here.

Tarki – urban village in Daghestan, sited 5–6 km from Makhachkala, on Mt. Tarki-Tau. Tradition has it that it is the site of the ancient site of Hazar Semender City in

the seventh-tenth centuries. Until approximately 723 the latter city was the capital of the Hazar Kaganate, which gave way to the mountain village Tarki with 3 mosques. The Dutchman Dapper in his book (1681) placed here the plan of Tarki Fortress that, according to him, had been built on the order of the Tzar by the Dutch engineer Cornelius Clausen in 1640. Late in the late fifteenth to early sixteenth century, it was the capital city of the Tarkov Shamkhalate. Above T. used to be Burnaya Fortess, which was built in 1821 on the order of General A.P. Ermolov; there is still an observation point fortified by masonry on the precipice of the rock. In 1831, the fortress was attacked by Gazi-Mohammad (Kazi-Mulla), Daghestan's first imam, who declared *jihad* (gazavat) on the Russian Tzar. The ensuing battle was fierce, and Russian soldiers had to blast a powder cellar to beat off the assault. In 1839, the Burnaya Fortress was pulled down, and its garrisons were moved to the maritime fortification Nizovoe. On June 22, 1827, Tengiz regiment arrived in the Burnaya Fortress; later, Russian poet M.Yu. Lermontov served in that regiment.

Tarki-Tau – a mountain whose peak is Tik-Tube (725 m) in the vicinity of Makhachkala City, Daghestan. T. creates a picturesque background for the city. Well-known to all the peoples of Daghestan, it serves as an orientation point for travelers and seamen. On the Caspian Sea side of Mt. T.-T. are three Kumyk villages: Aliburikent, Kyakhulai, and Tarki. The first two were included in the bounds of Makhachkala, while Tarki, which was at first a workers' quarters, later became a settlement.

Tarkov Shamkhalate – state in the territory of Daghestan in the late fifteenth to early sixteenth century with Tarki settlement as its center. It was governed by the Shamkhal.

Tatishchev Vasilii Nikitich (1686–1750) – outstanding historian, geographer, statesman, Lieutenant-General. In 1720–1722 and 1734–1737, he managed state-owned plants in the Urals and founded the city of Yekaterinburg. He was sent to Astrakhan in 1740 as the head of the Kalmyk Commission, and in a few months was appointed the Governor of Astrakhan (1741–1745). With T. as the Governor, the construction of a canal to relieve the flood situation was begun in Astrakhan in 1744 from an idea that had been proposed by Peter I. T. took measures to restore the Caspian flotilla (in 1725, it had 177 vessels, but after 1736 it had been sold to private interests). Measures towards the protection of the territory included commencement in 1742 of the fortification of the small Enotaevsk settlement, and in 1743, T. submitted a project to establish fortresses on the Volga River to protect the caravan routes and spread permanent settlement among the Kalmyks. In 1744, T. arranged “fruit mail”, which was delivery of fruits from Astrakhan to the Tzar court. Additionally, he took action to promote silkworm and cotton production by inviting merchants to Astrakhan from wherever he could. T. reinstated the Armenian community in the city, and he prepared a number of historical sources for publication and introduced the texts of “Russkaya Pravda” and “Sudebnik of 1550” (“Law Book of 1550”). In 1745, as Governor of Astrakhan, he submitted Woodruff's map

(see “Caspian Sea Mapping”) to the Admiralty Collegium, offering to make a full survey of the Caspian Sea. The Collegium, however, did not find it “worthwhile.” He is the author of works on ethnography, history, geography: “Russian History from the Most Ancient Times” (books 1–5, 1768–1848) and compiled the first Russian encyclopedic dictionary “Russian Lexicon.”



Tatishchev V.N. (http://www.encyclopedia.ru/upload/iblock/cdc/tatishchev_vasily_nikitich_246x294.jpg)

Tats – (self-name “tat”) a people who live in the northeast of the Azerbaijan Republic (11 thou people in 1999) and in the Russian Federation in the southern part of Daghestan around Derbent (2.3 thou people in 2002). T. is also indigenous to Iranian Azerbaijan. They are often referred to as “Caucasian Jews.” The language is Tat of the Indo-European language family. They are Shiite Muslims, Jews, and Monofist Christians. In 1990s thousands of T. moved to Israel.

TED “Caspii” – shortened name of Technical Economic Document “Feasibility Report on Protection of the National Economy Facilities and Human Settlements in the Coastal Zone within the Daghestan SSR, Kalmyk SSR, and Astrakhan Region against Flooding in View of the Rising Caspian Sea Level.” The report, comprising 14 volumes of substantiations and project solutions and a series of 17 maps presenting the natural-environment situation in the Russian part of the Caspian Seashore,

was prepared by decree of the RF Commission on Emergencies (1991). Many research and project-planning organizations took part in the preparation of T.: MSU, RAS, RF Ministry of Ecology, Ministry of Agriculture, Ministry of Construction, RF Department of Transport, and other organizations.

Tedzhen (Tajan) – river that flows into the Caspian Sea 2 km from Farahabad village on the Iranian shore in Mazandaran Province. It originates in the Sevadkuh, and its length is around 140 km. Its width at the mouth is 120 m, and at Farahabad village is 40 m. Depths on the bar are less than 1 m. The banks are precipitous, and the flow is slow. At the mouth, the Anakhy River flows into T., its bar depth being under 0.5 m.

Tehran, Teheran – capital and largest city of the Islamic Republic of Iran, and administrative, economic, political and cultural center of Tehran Province. It is known to have existed since the twelfth century in the form “Tehran.” Presumably, the root *tehr* is associated with the notion *bottom, lower*, thereby characterizing the position of the city in the southern foothills of Elburz at the height of 1,100–1,200 m. It is sited at the crossing of crucial ancient transport routes. Population 8.4 million people, with suburbs – more than 13.4 million people (2006). From 1789, T. was the national capital of Persia. At that time, its population was 15 thou people. Data are available indicating that in 1807, the population of T. was 50 thou people.

Early in the 1920s, the city modernized rapidly under a rectangular system of planning that related to the direction of subterranean and surface systems of water distribution. This was accompanied by rapid growth of the population. While in 1887, the population of the city was 250 thou people, by 1930, it had increased to 300 thou, and by 1939 it was 500 thou people. WWII suspended this growth, but after the war, during the oil boom period, the population was already 1,800 thou people by 1956, increasing to 2,720 thou in 1966, and to 4,530 thou people by 1976.

T. is a crucial center of food processing, textile, leather goods, footwear, tobacco, chemical, machine-building (electrical engineering), motor, and munitions industries. It is a major junction of railways, highways, and air traffic routes.

In 1943, an historic summit of the heads of governments of the USSR, USA, and Great Britain (I.V. Stalin, F.D. Roosevelt, W. Churchill, respectively) was held in Tehran.

Imam Khomeini Square is regarded an official center of T. Here, within the radius of 1.5 km, a huge number of hotels are concentrated. T. is bisected in the center with government and administrative buildings, and the districts adjoining it from all sides; in appearance, the districts are reminiscent of major European cities. The city of Tehran is divided into 22 municipal districts, each with its own administrative centers. Within these 22 districts, Tehran contains several dozens of the major neighborhoods. The majority of Tehranis are the followers of Twelver Shia Islam which is also the state religion.

The places of interest include Golistan Palace, the old-time roofed-in bazaar, Paster Institute, Iran Carpet Museum, Archeological Museum, and others.



Azadi Monument (Tehran, Iran) (<http://img.travel.ru/images2/2008/05/object123594/teh04.jpg>)

Temir-Khan Shura – see *Buinaksk*

Tenge – monetary unit and the national currency of the Kazakhstan. 1T. = 100 Tiyns. The word *tenge* in the Kazakh and other Turkish languages means a set of scales. The origin of the word is the Turkish *teg* which means being equal, balance. The name of this currency is thus similar to the Lira, Pound, and Peso.

Kazakhstan was one of the last countries of the CIS to introduce its national currency. Tenge was introduced on November 15, 1993. Its paper banknotes were printed in U.K. and have from 12 to 15 degrees of protection. In 1993, the National Bank of Kazakhstan issued notes in denominations of 1, 2, 5, 10, 20 and 50 Tiyn; and 1, 3, 5, 10, 20, 50, 100 and 200 Tenge. In 1994 these were followed by 500 and 1,000 Tenge notes. 2,000 Tenge notes were introduced in 1996, with 5,000 Tenge in 1998 and 10,000 Tenge in 2003. Notes currently in circulation are: 200 Tenge with a portrait of Al-Farabi (the well-known philosopher, mathematician, oriental encyclopaedist); 500 Tenge with a portrait of Al-Farabi, fragment of Khodzha Akhmet Yassau Mausoleum; 1,000, 2,000, 5,000 Tenge with a portrait of Al-Farabi; 10,000 Tenge with a portrait of Al-Farabi and image of snow leopard.

In 2006 the National Bank of Kazakhstan issued banknotes of new series. They have the same values as the previously existed ones (200, 500, 1,000, 2,000, 5,000, and 10,000 Tenge), but are more exotic than their predecessors. The obverse is vertical and the denomination is written in Kazakh. All denominations depict the Astana Bayterek Monument, the flag of Republic of Kazakhstan, the Coat of Arms, the handprint with a signature of President N. Nazarbayev and fragments of the national anthem. The main difference between notes with different denomination is only the colours, the values, the underprint patterns. On the contrary, the reverses are more differentiated: the value is written in Russian and each note shows a unique building

and geography features of Kazakhstan. In 2010 a special banknote with denomination 1,000 Tenge was issued to commemorate the Chairmanship of Kazakhstan in OSCE.

The first coins were minted in Germany. In 1993 coins were introduced in denominations of 2, 5, 10, 20 and 50 Tyin; 1, 3, 5, 10 and 20 Tenge. In 1997 50 Tenge was introduced, followed by 100 Tenge in 2002 and 2 tenge in 2005. Coins currently in circulation are: 1, 2, 5, 10 Tenge (Brass), 20 and 50 Tenge (Copper-Nickel), 100 Tenge (Bimetallic, Brass and Copper-Nickel). Commemorative coins were issued in denominations of 20, 50, 100, 500, 1,000, 2,500, 5,000 and 10,000 Tenge.

Tengiz, Tengiz Field – discovered in 1979, it is a 4 thou km² are in the Caspian coastal zone in Atyrau Region of Kazakhstan. In terms of the depth of oil-bearing strata, this is the world's deepest massive oil field, with geological reserves estimated at 1721.5 million tons. According to forecasts, recoverable reserves from the T. field equal 750 million to 1 billion 125 million tons of oil (i.e. from 6 to 9 billion barrels). On April 6, 1993, the Kazakhstan “contract of the century” was concluded with a long-term (40 year) agreement with the US company “Shevron” for joint development of the T. field.

Tentek-Sor – the Kazakh name for the huge solonchak that stretches between the Urals and the Emba River.

Terek (in ancient time – Ugru) – river in the North Caucasus. *Terk-Kala* (Chechen – *Poplar fortress*). It is believed that the name of the river originated from the Osetin *Big river* in the Ingush language “Terghi” – *wide, spreading*; in Kabardino-Balkaria – *Terk* – *rapid, strong*, sometimes, it is thought that the name was derived from “fortress”. The length of the river is 591 km., and the basin area is over 43.7 thou km. The T. originates on the slopes of the Greater Caucasus Mountain Range, at the glacier Zilga-Hoh (3,244 m). The first 30 km flows between the Greater and Lateral Ranges. Near the village Cobi, it turns abruptly to the north and crosses the Lateral Range into Daryal Gorge, then continues through the Rocky Range and Black Mountains. As the river leaves the mountains, it falls into arms and lateral arms. After the Sunzha River falls into it, T. flows down into the Circum-Caspian Lowland and into the Caspian Sea, forming a delta of around 4,000 km² in area. Its feeding is mixed, and it freezes for a short time. The main tributaries are, on the left, the Ardin, Uruk, Malka (with Baksan); and on the right, the Sunzha. The waters of T. are used for irrigation. Upstream of Mozdok, the Terek-Kuma irrigation and water-supply canal branches off from T. In the mountains, T. and its tributaries are used for power generation (Baksan Hydroelectric Plant, Gizeldon HEP, and others). On T. River are the cities of Vladikavkaz, Mozdok, and Kizlar (in the delta).

The territory of Daghestan accounts for 19% of all T. basin area. Not only are the lower deltaic and estuarine parts located here, but also, after the 1914 catastrophic flood that breached the main channel at Kargalinskaya Cossack Village, and a New T., called Alikazan, has flowed in the lower reaches and is regarded as the beginning of the active delta. The largest arms are called “banks” here: Main, Batmaklin,

Kuni, Kubyanin, Severnyi (Northern), Uchin, and Kardonka. Average runoff of T. is $8.4 \text{ km}^3/\text{annum}$, and sediment runoff is 11.9 million tons/annum.

The level of the water surface of the river arm and braidchannels is 2–8 m above the inter-ridge hollows: this, coupled with a large amount of arriving sediments, conditions the dynamism of the T. delta. When T. arms are breached, which is common, new lacustrine-river systems, called “cut-offs,” are formed.

T. delta gradually merges with the deltas of the rivers Aksai, Aktash, and Yamansu and with the delta plain of the Sulak River.

Terek Breaking Waves, Terek Sand Massif (Mozer Sands) – alluvial sand massif in Nogai Steppe, Daghestan delimited on the south by Terek River Valley and on the north by the Kayasula-Kizlar Highway. The sand ridges are 30–40 m high and alternate with gently-sloping inter-ridge hollows (10–20 m). The so-called surf sands are used as ranges and hayfields and in places for grape-growing. There are a number of lakes in the Terek sands, including Bolshoi (Greater) Manych, Arnaut, Ahmet-Sarai, Narsun-Su, Bolshoi Sarysu, Bolshoi and Maly Ak-Terek.

Terek-Kuma Canal – irrigation and water-supply canal in the North Caucasus that supplies the waters of the Terek River to the Kuma River Its length is 150.3 km, and it has 35 hydrotechnic structures. It was commissioned in 1961 with irrigated area of 100 thou ha, with an improved water supply in an area of over 1 million hectares, including Nogai Steppe, Daghestan.

Terek-Kuma Lowland – (Nogai Steppe) occupies the northernmost part of North-Daghestan Lowland and is situated in the Kuma and Terek rivers interfluvium. It stretches from the eastern termination of Stavropol Upland to the Caspian Sea. The western part of the lowland is at heights from 0 to 120 m above ocean level. T.K.L. is an aggraded plain structured by the sea and the continental Upper Pliocene and Quaternary sediments. Sizeable areas are occupied by maritime and deltaic light sands in the form of barchans, dunes and sand breaking waves (ridges). The largest sand massifs are here (Kuma, Bazhigan, Terekli, and Terek breaking waves). In the southeastern part of the lowland is the Terek delta. In the central part of T.K.L. between its rivers Mutnyi Artesian, Kochubei, and Talovskaya, which go dry and turn to solonchaks in summer, are numerous small and medium-size salt lakes. All of them are relict formations of the ancient Caspian transgression.

The coastal strip of T.K.L. is an ideal flat plain structured by sand-clay deposits. The coastal strip of the Caspian Sea has extremely shallow-water and constitutes cane overgrown plavni (flooded areas), reaching 3–4 km in width.

Terek-Kuma Sands – located in the Terek-Kuma Lowland, these are transversed by four wide strips of sand ridges stretching at the base from the northwest to the southeast. The first strip – the Kuma sand massif – is strung along the Kuma River as far as the railway line Kizlar-Astrakhan. The height of the ridges range from 5–10 to 20 m, at widths of 15–30 km. As a result of this, a considerable part of the sand massif is a gently-sloping, hummocky sand plain. The second strip – the Bazhigan massif – begins from the outskirts of Achikulakh Vill. (Stavropol Territory) and

stretches as a narrow strip (8–14 km) to the southeast. The third strip – the Terekli Sands located to the southeast of Bazhigan and in the environs of Terekli-Mekteb village – for the most part occupy a small area. Bolshoy Sarychalinsky, Pobem-Su and other lakes are located in the South-Terekli sands. The fourth strip is Terek Sand massif, or Terek breaking waves.

Terek Plavni (Flooded Areas) – water-logged areas formed as a result of bank levees being breached in the lower reaches of the Terek River, Daghestan.

Terek River Delta – situated in the northeastern part of Terek-Sulak Lowland, Daghestan. It is a low-lying seaside plain slightly inclined toward the Caspian Sea. TRD is in the arid climate zone. The existing mouth area of the Terek, totaling over 8 thou km², includes the delta (4,000 km²) and the river offing (around 3,700 km²). The river used to flow into Kizlar Bay of the North Caspian. When the bay was filled up a large deltaic plain was formed. As each period of delta formation was completed, the Terek broke through to the sea in new, shorter southern directions. As Terek arms get broken through, cutoff lake and river systems are formed. The last such breakthrough occurred near Kargalinskaya village. From that moment, the delta of a new Terek began to take shape.

The annual water runoff in delta summit equals 8.9 km³, with a suspended load runoff of 15.1 million tons. TRD gradually merges with the deltas of the rivers Aksai, Aktash, and Yamansu, and with the deltaic plain of the Sulak River. Detrition and sedimentation from the Terek River coupled with permanent siltation of the channels cause the closure of the existing delta and its shift within the existing part of the Circum-Caspian Lowland. Not only do the detrition materials settle in TRD, they also settle into the Caspian Sea, where sandbanks of the Terek produce the sand spits Bryanskaya, Suyutkino, the western part of Agrakhan Peninsula, and the Chechen Archipelago. There are many small, shallow lakes in TRD linked with one another by bypasses. Conducive to this system are the Terek surface waters, which, flooding the lower reaches, inundate the surrounding areas. The area of most lakes does not exceed 1 km². According to hydrological peculiarities, the TRD lakes are subdivided into 3 groups: Arakumsk, Lower-Terek, and Karakol and Shirokol lakes that are in the Talovka River lower reaches.

Terek-Sulak Lowland – extends from the Terek River to Makhachkala and is confined by the belt of foothills and the Caspian Sea. The lowland encompasses Agrakhan Peninsula that juts out far into the sea and the Chechen Archipelago. The existing position of T.-S.L. used to be the site of ancient and contemporary merged deltas of the Terek, Sulak, and Shuraozen Rivers. Its surface is dissected by the numerous arms of these rivers, ancient and existing surface water courses, a network of irrigation canals, and drainage structures. The surface of T.-S.L. is structured by alluvial and lacustrine-alluvial formations, which are underlain by ancient Caspian marine deposits, with thicknesses ranging from several meters to dozens and even hundreds of meters. Standing out in microrelief are linear depressions, padings, sandy hills, and ridges dissected by deflation basins, mounds, etc. Most of the area is inclined eastward, structured by a thick mass of alluvial deposits of

the rivers Terek, Aktash, Aksai, Sulak, and Shuraozen. In the western part of the area, the absolute height reaches 200 m, and in the eastern part the minimum is –27 m. Here, between the Shuraozen River and the old channel of the Sulak River, Prorva and in the lower reaches of Sulak is an assemblage of several lakes, including Mekteb, Almalo, Osadchee, Altaus, Aktashskie, Solenoe and Bogatyrevskie floodings, and others. T.-S.L. is dissected into a number of subareas, including the Terek River delta, Kумыk and Circum-Sulak Plains, the coastal zone, and Chechen Island.

Terekmei Plain – part of the Coastal Lowland in Daghestan. In the north, it is limited by Cape Buinak, and in the south by the Derbent pass, while in the west is bordered by the offspurs of Predgornye (Piedmont) Ridges. The length of the plain is over 40 km, and the width is around 16 km. Ancient Caspian terraces developed fully within T.P. The main forms of relief are benched surfaces and ledges, while the large depression of the salt Lake Aji is here. South of the lake, the surface of the late Khvalyn Terrace is smooth and flat. The monotony of the plain is broken up by the valleys of the rivers Ulluchai and Darvagchai and by the solonchak depression Duzlak, which used to be the site of salt production by natural evaporation of Caspian waters. To the south of the Darvagchai River are typical ravine-and-balka dismemberments: Sirkani-dere, Duzlak-dere, Kara-Sulak and Shorbulak balkas.

Territorial Waters (Sea) – is a belt of coastal waters that is part of the sovereignty of a coastal state and which is to be regarded as the continuation of the territory of that state. Foreign vessels coming into T.W. shall comply with the civil and criminal jurisdiction of the coastal states, which shall not deprive them of the right to sail unhindered through T.W. with people and cargoes on board (the right of free transit). When sailing in T.W., sea vessels are obliged to comply with navigation and other rules established by the coastal state. No dues (except dues for services rendered, such as making a pilot or tugboat available) shall be collected from the vessels passing through T.W. There are no specific provisions regarding the width of T.W. in international law or international practice. The width of T.W. varies from 3 to 12 miles. No internationally-recognized T.W. on the Caspian Sea exists.

Tesha, Teshka – sun-dried or smoked belly part of inconnu and Caspian salmon. Considerable fat content in this product imparts exquisite taste and aroma to T. More often T. is made of great sturgeon as its peritoneum is the most fleshy and thickest of all available options.

“The Caspian Region: Politics, Economics, Culture” – journal published since 2002 at the initiative of Astrakhan Regional Administration, the Russian Philosophical Society and Astrakhan State Pedagogical University in Astrakhan, Russia. The journal sees its objective as bringing together the efforts of specialists working in different areas of science, politics, philosophy, jurisprudence, philology, cultural studies, economics, and history for a profound analysis of the processes going on around the Caspian Sea, whose waters wash the shores of 5 countries.

The Iranian Fishery Organization – often referred to as “Shilat” – a specialized quasi-public government organization controlling fish yields and import and sale of black caviar on the domestic market and foreign markets. “Shilat” reduced the yield of sturgeons from 1993. In 1994 “Shilat” issued new regulations establishing a limit imposed on fish yields of all sturgeon species having at least 1 m in length, though current quotas are unknown.

Tiger Shoal – a shoal, sometimes a spit, sited at the Azerbaijan coast south of Kyzylagach Bay and stretching southward along the shore for about 2.8 km. It was formed at the place the steamer “Tiger,” after which it was named, sunk before 1916.

Tinaki – the oldest (fourteenth century) balneal mud area in Astrakhan Region, 15 km west of Astrakhan on the right bank of the Volga River. Its curative properties derive from silt, peat mud, and salt brine of the saline Tinak Lake and from mineral waters. It is open from May to October. Since the 1960s, the wastes of the nearby pulp-and-cardboard mill have been dumped in Tinak Lake. In 1997, the mill was shut down because of a lack of raw materials and for environmental protection.

Tolcheya (Cross Sea) – type of wave oscillations resulting from the interference of several wave systems as these are reflected from the shore or a hydrotechnical structure as two wave systems collide near a cape, etc.; haphazard displacement of the waves caused by a rapid change of wind direction. During T., low but steep waves are produced. On the Caspian Sea, which is considered as rough, when strong winds blow waves develop rapidly and they may have an irregular character. Very often this leads to formation of T. T. complicates sailing considerably, especially when the wind is gusty, and is a hazard to small ships that do not have sufficient stability.

Tonya – fishing; fishermen’s settlement; fishing ground and place where fishermen live; convenient site on a river or lake shore; bay on the sea where fish assemble and a fish catch is successful. In the Volga delta, T. are Avangardnaya, Krasnoe, Karai, Kontrolnaya, Zelenginskaya, Zolotaya, and others.

Total Allowable Catch – quantitative index of possible seizure of target species. TAC is set on the basis of the state of aquatic bioresources to conserve biodiversity of wildlife and the capacity of aquatic bioresources for reproduction and sustainable existence.

Towboat (in the Dutch *boegseren*, meaning tow) – a self-propelled vessel for towing non-self-propelled boats, drilling platforms, rafts, and other floating structures. By maritime region are distinguished marine, river, lake, and road towboats. By purpose, there are towboats leading vessels on a towline; tilting boats that help vessels at moorage in a port; pushboats for moving vessels by pushing; and rescue boats for rendering help to the damaged ships in open sea and their towing to a port.

Trading Company – company whose main functions pertain to the sale or resale of, for example, energy resources. Normally, in this case a company does not produce energy resources.

Train-Ferry – is a ship for carrying railway vehicles across the sea. Typically, one level of the ship is fitted with railway tracks, and it has a door at the front and/or rear to give access to the wharves. There is a large TF operating on the Caspian Sea between Baku and Turkmenbashi (formerly Krasnovodsk).

Transcaspian – areas east of the Caspian Sea.

Transcaspian Region – formed in 1881 from the Transcaspian Division of the Caucasian Military District made up of Akhaltekin, Krasnovodsk and Mangyshlak Counties. The center was the city of Ashkhabad (since 1919 – Ashkhabad). In 1854, Merve and Tedjen Oases were annexed to TR, followed by the annexation of the Pendinsk Oasis in 1885. In 1887, the border between TR and Afghanistan was established. TR territory was shaped up finally by 1890 with the counties of Ashkhabad, Krasnovodsk, Mangyshlak, Merve and Tedjen. From 1890, TR was under the direct purview of the Russian Military Ministry, and from 1897 it was part of Turkestan Territory. In 1897, the TR land area was more than 456.6 thou square versts, and its population was 322.1 thou people (Turkmen, Kyrghyz people, Russians, Armenians, Persians, and others), of which the urban population was 42 thou people. The first Russian settlement was set up in 1889, and by 1910, there were 27 Russian settlements in TR (around 5 thou inhabitants). The main occupation was arable farming (irrigated), cotton-growing, melon-growing, horticulture, and animal husbandry (sheep, camels, horses).

Industry was at an early stage of development, and included artisan and semi-artisan enterprises (cotton ginneries, oil-mills, soap factories). Industries also included carpet-weaving and felt-making. On the Caspian shore was fisheries (herring, great sturgeon, sturgeon, starred sturgeon, and other fish species). There was oil production on Cheleken Island (1910 – around 8 million poods) (1 pood = 16 kg). Conducive to territory development was the construction of the Transcaucasian Military Railway in 1880–1888. TR promoted trade with Persia, Afghanistan, Bukhara, and Khiva. Forty-two educational establishments, hospitals, and dispensaries of the military department were opened in TR by the end of the nineteenth century. Additionally, there were 14 Russian Orthodox and 4 Armenian-Grigorian Churches, 169 mosques, and 4 Jewish houses of prayers. In 1921, TR was renamed the Turkmen Region.

Transcaucasia – part of the Caucasus to the south of the Main or Water-Divide Greater Caucasus Range. T. includes most of the Greater Caucasus southern slope, Kolkhida and Kura-Araks Lowlands, Transcaucasian Highland, Talysh Mountains and Lenkoran Lowland. The greater part of Georgia, Armenia, and Azerbaijan are all within T.

Transcaucasian Federation – association of the Soviet Republics of Azerbaijan, Armenia, and Georgia (12.03.1922–05.12.1936). From 12.03.1922, Federative Union of Socialist Soviet Republics of Transcaucasia (FUSSRT). On 13.12.1922, FUSSRT was transformed into the Transcaucasian Socialist Federative Soviet Republic (TSFSR), which from 30.12.1922 was part of the USSR. From 05.12.1936, the Azerbaijan, Armenian, and Georgian SSR were direct members of the USSR.

Transfrontier Waters – any surface or underground waters that cross the frontiers of two or more states or are along such frontiers. When T.W. fall into the sea, the division of such T.W. are demarked by a straight line crossing the mouth between the points positioned on a low-water line on their shores.

Transgression – («*transgression*» (Lat.) – “transition”) – advance of the sea onto the land. It is accompanied by abrasion. As a rule, it is produced by the lowering of the land; hardly ever by a rise of the ocean level. On the Caspian, T. is a frequent phenomenon made of a series of smaller retreats of the sea, the advance being prevalent. A section of the deposits formed as a result T. is generally characterized by the replacement from underneath upward of shallow-water facies (opposite to the regression).

There were 7–8 T. in the Pleistocene period on the Caspian Sea (four main transgressions, each comprising two phases). The sea level at the time was close to +50 m abs. level.

Transiran Railway – built in the 1930s, it crossed Iran and linked the ports on the Caspian Sea (Bandar-Torkaman) and the Persian Gulf (Bandar-Imam Khomeini). Its length was 1,394 km.

Transit of Energy Resources – transport of energy resources, including oil, gas, and electricity, across the territory of a foreign state.

Transport Corridor Europe-Caucasus-Asia (TRASECA) – project of new Eurasian transport corridor passing via the Caucasus Region. The idea of the rebirth of the Great Silk Road is the basis of a program of technical assistance to the development of the corridor, which was reviewed in 1993 at a conference in Brussels, Belgium with the participation of the leaders of eight countries of Trans-Caucasia and Central Asia. At the time, the countries, members of the European Union, signed the Brussels Declaration on the Development of the Transport Corridor Europe-Caucasus-Asia (TRASECA). The main junctions for the distribution of transportation flows in the South Caucasian corridor presumably will be the ports of the Black and Caspian Seas: Poti and Batumi (Georgia) – to East and Central Europe via the ports of European countries on the Black and Mediterranean Seas; from Baku (Azerbaijan) to Central and Far-Eastern Asia via the ports at Aktau (Kazakhstan) and Turkmenbashi (Turkmenistan).

Treaty Between the Russian Socialist Federative Soviet Republic and Persia, the 1921 Treaty – signed on February 26, 1921, established the principles of equality as the basis for bilateral relations between the two states (this had to do with the rights of navigation, too). The treaty was also a formal renunciation by Soviet Russia of all treaties and agreements of the tsarist government. The parties agreed upon the right to honor the Russian-Persian frontiers established by the 1881 Conciliatory Commission but without determining the boundary in the Caspian waters. Both the parties agreed “to use equally the right of free navigation in the Caspian Sea, flying their respective flags.” Furthermore, it was stated that Russia could deploy its troops in Persia in case any third countries tried to turn the territory of Persia into

a base for crossing the borders and taking military action against Russia. The idea of denying access of third countries to the Caspian Sea was developed further in the provision saying that “should there be found in the crew of the Persian Fleet ships any nationals of third countries using their service for the Persian Fleet to purposes unfriendly towards Russia, the Russian Soviet Government will be entitled to demand that the Government of Persia take action to get rid of such harmful elements.” Under the Treaty, the Iranians obtained the right to participate actively in fishing through additional arrangements.

Treaty on Establishment of Trade and Navigation Between the USSR and Iran – signed on August 27, 1935. Pursuant to its provisions, all aspects of using the sea and its resources were deemed the sole right of the coastal states.

Treaty on Trade and Navigation Between the Union of Soviet Socialist Republics and Iran, the 1940 Treaty – signed on March 25, 1940, it virtually replaced the Treaty on Establishment of Trade and Navigation between the USSR and Iran from August 27, 1935. A new development in the Treaty was that it stressed once again the fact that only ships belonging to the two coastal states were entitled to ply the Caspian waters and that foreign personnel on board those ships and working in the ports were to confine their activity to the limits specified in the contracts. The treaty established the rights of fisheries in the Caspian Sea within a 10-mile fishing zone.

Tsakhury (self-name *Iykhby*) – people in the Russian Federation who live in Dagestan along the right tributaries of the Chiragchai River (12 thou people in 2002). They also live in Azerbaijan (16 thou). Their language is Tsakhurian of the Lezgin group, Dagestan branch of the Iberian-Caucasian languages, with dialects Tsakhsky and Gelmetsky. They are Sunni Moslems.

Tunikabun – a plain in the Iranian “Caspian Riviera”. It is a 175 km long. In the elevated portion, it is covered with wood, while in the low-lying part it is largely made up of paddy fields. There are a good deal of walnuts and valuable fruit trees in thick subtropical woods there, and citrus cultures are available in great amounts. Palm trees grow in natural conditions on the mountain slopes. In the eastern part, T. gives way to mountain terrain and is regarded as one of the most picturesque locations on the southern Caspian shore.

Turali Lakes – see *Greater and Lesser Turali*

Turang Tappe – ruins (destroyed by the invasion of the Mongols) of the main caravan-sarai and main city of the Mazandaran region, Iran. The city is also referred to as “Mazandaran Troy.” The ruins are 22 km to the north-northeast of Gorgan City. Excavations undertaken in the twentieth century uncovered five different layers, the earliest one dating from the 6th millennium B.C.E., and the most recent one from the early Islamic era.

Turkistan – derived from “Turk-Shtan,” a Persian word meaning “Country of Turks,” which is how the Persians used to refer to countries to the north of Ferghana and Bukhara where nomadic Turk tribes roamed. The former name of the extensive area stretching from the Caspian Sea on the west to the border with China on the east; from Aral-Irtysh waterdivide on the north to the border with Iran and Afghanistan on the south (Russian T.), including the West China provinces (Chinese or Eastern T.) and the northern part of Afghanistan (Afghan or South T.). On the territory of Russian T. were the Bukhara and Khiva Khanates and the Domain of the Turkistan Governor-General (from 1867), centered in Tashkent and transformed in 1886 into Turkistan Territory. After 1917 and following the establishment in 1924–1925 of the Soviet Socialist Republics and Autonomous Areas based on the nationalities, the name Russian T. was replaced by “Central Asia.” Since 1993, the Central Asian Republics have called themselves Central Asia.

Turkistan Autonomous Soviet Socialist Republic (TASSR) – part of the RSFSR from 30.04.1918 to 27.10.1924, the population was over 5 million people and the capital city was Tashkent. In the course of nationalities and state division, there were established the following constituent entities on the territory of TASSR: Uzbek SSR, Turkmen SSR, Tajik SSR, Kara-Kyrghyz AO, and Karakalpak AO.

Turkmen – the core population of Turkmenistan (5 mln people). T. also live in Iran (1.3 mln), Afghanistan (0.9 mln), Turkey, and Syria. In RF there are around 33 thou people. Before the October Revolution, T. adhered to clear division into tribes: Tekins or Teke (the basins of the Murghab and Tedzhen), Iomuds (Circum-Caspian areas), and others with dialectal and cultural and lifestyle peculiarities. The language is Turkmen of the Oguz group of the Turk languages, and the religion is Sunni Muslim.

Turkmen Bay – located on the Turkmen shore of the Caspian Sea, to the south of Cheleken Peninsula, it is bordered on the west by the shoreline of Ogurchinskii Island and by Southern Cheleken Spit. From the south, entry in the bay is possible via the water area of Karadashly Bay near the southern tip of Ogurchinskii Island; the distance between the two is around 70 km. the bay is nearly 75 km long. The northern part of T.B. is called South Cheleken Bay. Its shores are low-lying and desolate just as the shore to the south of it. The eastern shore is heavily dissected, forming a number of small peninsulas and spits separating the small bays. By and large, T.B. is shallow, with depths are under 10 m that decrease both in the direction of the eastern shore and southward, where shoal banks and shoals are not uncommon. The bay has no convenient berthing sites.

Turkmen Roach – see *Southeast Caspian Roach*

Turkmen Sea Shipping Line – established in 1992 to carry passengers and freight traffic independently over the Caspian and other waterways. Four dry-cargo vessels of 3 thou t each were immediately commissioned: “Saparmurat Niyazov,” “Turkmenistan,” “Makhtumkuli,” “Balkan.” Besides, T.S.S.L. chartered vessels transport oil and oil products from the shipping lines “Lenaneft” and “Volgotanker.”

To ensure oil production and exploration of new fields, however, T.S.S.L. realized that it must have a tanker fleet of its own. The ferry service “Turkmenbashi-Baku” was reactivated. The ferry traffic Turkmenbashi-Olya (Aastrakhan Region) began to function, too. For the first time in the history of Turkmenistan, the bulk-oil tanker “Gahryman Atamurat Niyazov,” named after the father of the former President of Turkmenistan, was commissioned. There are plans to build a few more similar vessels.

Turkmenbashi – (formerly Krasnovodsk) – city, former center of Krasnovodsk District, and from 1952 to 1955 the center of Krasnovodsk Region of the Turkmen SSR. After 1991, it was part of Balkan Velayat, Turkmenistan. It first emerged as a fortress near “Kyzyl Su,” which means “Red Water” in 1716 during the expedition of A. Bekovich-Cherkassky along the eastern shore of the Caspian, and then in 1868, it became a military fortification. Its population is now around 68 thousand people (2005). Turkmenbashi has an oil refinery, ship-repair plant, and building materials plant along with a food-processing industry (fish plant and baking & meat-processing factories).

The largest port on the Turkmen shore of the Caspian Sea (earlier Taza-Shahor (fifteenth–sixteenth centuries)), it was established in 1896. Sited near the northern shore of Turkmenbashi Bay (formerly, Krasnovodsk Bay) and occupying the entire water area of Muraviov Bight, which is named after N.N. Muraviov, who explored the eastern Caspian shore from 1819 to 1821. The port is used for freight carriage (oil and oil products, containers, bulk materials, etc.), for the fisheries sector, and for passenger traffic and ferry service. Three organizations with rather powerful fleet facilities in T. are the Turkmen Sea Shipping Line, “Balkanbalyk” Association, and “Turkmenneftflot” Authority, which all having 25–28 sea vessels. The port is currently being refurbished to increase the volume of cargo handling operations to 10 million tons/annum in anticipation of subsequent growth.



Turkmenbashi oil refinery (<http://thenews.kz/2009/09/13/127705.html>)

Turkmenbashi (Krasnovodsk) Bay – located in the southeastern part of the Caspian Sea, it is separated from the sea by Krasnovodsk and the Northern Cheleken low sand spits. Its length is 46 km, and its width at entry is 18 km, with depths under 5–6 m. The total area of the bay is 1,500 km². A group of drained islands are in the center of the bay. The bay is devoid of permanent currents. Its shores are dissected by numerous inlets and armllets of which Northern Cheleken and Balkhan as well as Muraviov and Soimonov bays are the largest. In Muraviov Bay, which is to the west of Ufra Peninsula, is Turkmenbashi Port. Water salinity in the bay is 12.8–14‰.

Turkmenchay Agreement (Treaty) of 1828, Turkmenchay Peace – “Peace Treaty Concluded with Persia at Turkmenchay on February 10, 1828” (“*Traité additionnel conclu entre la Russie et la Perse à Tourkmentchai, le 10 fevrier 1828*”) that ended the Russian-Persian War of 1826–1828. It was concluded on February 10 (22), 1828 at Turkmanchay village (near Tabriz, Persia). As dictated by the Treaty, Erivan and Nakhichevan Khanates became part of Russia. The Treaty confirmed the terms of the Gulistan Peace Treaty of 1813 on the Right of Russia to have its Navy on the Caspian Sea, and was, until 1917, the basis of Russian-Persian relations. The text of the Treaty was drafted by the Russian writer and diplomat A.S. Griboedov. To follow up the implementation of the T.A. terms, the stationing of Caspian Navy ships was arranged in Anzali port and the Astrabad Sea Station was transferred from Sara Island to Ashur-Ade Island.

Turkmenistan – state situated in the southwest of Central Asia adjoining the Caspian Sea to the west. Its length from the west to the east is 1,100 km, and from the south to the north is 650 km. In the north, it borders Kazakhstan, while in the northeast it borders Uzbekistan. To the south-southeast is Afghanistan, and in the south is a border with Iran. Its territory is 491.2 thou km², of which 375 thou km² is desert. Its population is 4.9 mln people (2009), and the capital City is Ashkhabad (828 thou people). The country has 21 city, among them: Turkmenbashi (formerly Krasnovodsk), Turkmenabat (formerly Charjou), Dashoguz (formerly Tashauz), and Balkanabat (formerly Nebit-Dag), and others.

The Caspian Sea shoreline is slightly dissected in the south, while in the north it has a winding outline, forming the Kara-Bogaz-Gol, Turkmenbashi, Turkmen bays, and Krasnovodsk, Cheleken, and Dardzha Peninsulas. Near the shore is Ogurchinskii Island. In the south is Mts. Kopetdag, which rise up to 2,942 m (Mt. Rize), and northern foothills of Paropamiz: the Batkhyz Upland at elevations below 1,000 m and the Karabil Upland which is below 980 m. In the extreme southeast stretches a spur of the Gissar Mountains, including Kugitangtau, which is below 3,139 m. To the northwest of Kopetdag are two stand-alone ranges, the Minor Balkhan (below 777 m) and the Greater Balkhan (up to 1,880 m).

In the west, the Krasnovodsk Plateau with the steep precipice Kureningkuresi at under 306 m, and to the northwest are the Ustyurt spurs – Kaplankyr, Chelyunkur, and Kostmatdag Plateaux. The Kopetdag Mountains are hemmed by the piedmont plain that merge with the Circum-Caspian Lowland in the west. To the north and

northeast of the plain's foothills stretches the Karakum Sand Desert, which occupies the low-lying Turkmen Plain. In the north and northeast, it is limited by Sarykamysh Basin and the Amudarya Valley, and in the west by the dry channel of Western Uzboi. T. also includes the narrow strip of the Amudarya's right bank area, which is composed of the western part of the Kyzylkum Desert and the Sundukli sands.

The climate is sharp continental and dry. The mean temperature in January is -4°C (in Atrek Valley $+4^{\circ}\text{C}$) while in July it is $+28^{\circ}\text{C}$. Annual precipitation ranges from 80 mm in the northeast to 300 mm and more in the mountains. The wind blows incessantly, and sand storms are frequent.

The main rivers are the Amudarya, the length of which on the territory of T. is over 1,000 km but not a single tributary flows into it in T (a significant part of its water goes to Karakum Canal, currently known as Karakum River); the Atrek, (the only river in T. that inflow into the Caspian Sea); the Tedjen; Murgab; and Sarykamysh Lake. In the north of Karakum Desert an artificial Altyn Asyr Lake was constructed in 2009. The soils are predominantly gray-brown and serozems. Vegetation is mostly that of desert landscapes, and the mountains feature a vertical belt pattern (upward of 1,500 m) with savin bushes and caryocarpus woods. In the river valleys are riparian woodlands. There are 8 reserves in T., including Badkhyz, Repetek (from the late 1970s, a biosphere reserve), Hazar (formerly, Krasnovodsk reserve), Kopetdag reserves, and others.

T. is endowed with diverse mineral resources, including oil (according to government estimates, the Turkmen sector of the Caspian Sea contains 3 billion tons of oil, while other forecasts data indicate 12 billion tons, while on land there are Balkanabat, Okarem, Kumdag, and Cheleken deposits); gas (gas field reserves are put at 26 trillion cubic meter), including the Shatlyk, Maiskoe, Gas-Achak, Balkanabat and other fields; sulfur, potassium, and rock salts (Gaurdak); as well as non-ferrous and rare-earth materials. There is also mirabilite production (Kara-Bogaz-Gol Bay) and rich renewable resources in solar and wind-energy.

The early states emerged on the territory of present-day Turkmenistan during the 1st millennium B.C.E. (the states Margiana, Parthia, Midia). During the sixth to fourth centuries B.C.E., those states were under Iranian Akhemenides and Alexander the Great. From the third century B.C.E., the Parthian Kingdom and the state of the Sassanides ruled, and from the fifth to eighth centuries C.E. the territory of Turkmenia was invaded by the Ephthalites, the Turks, and the Arabs. By the eleventh century, it was conquered by the Oguz. From the eleventh to thirteenth centuries, it was part of the Seljuk State and subsequently, of Horesm. In the thirteenth to fifteenth centuries, it was under the rule of Mongolian Tatars, then in the state of the Timurides. The Turkmen nation essentially took shape in the fifteenth century. From the sixteenth to seventeenth centuries, T. was part of the Khiva and Bukhara Khanates. At the end of the 1860s until the mid-1880s, the territory of T. was annexed to Russia (Trans-Caspian Region). In November–December of 1917, Soviet power was established in T, and 30.04.1918, at the 5th Congress of Soviets of the Turkistan Territory, the Turkistan ASSR as part of the USSR was established. It included most of the T. territory (Trans-Caspian Region, renamed Turkmen Region in August of 1921). On 27.10.1924, in the separate areas inhabited by the Turkmens, the Turkmen SSR was formed. On 22.08.1990, the Supreme

Soviet of the Turkmen SSR adopted the Declaration on State Sovereignty of the Republic, and on 26.10.1991, at the all-people referendum for state independence of the Republic, 94% of the voters said "Yes". Since November 1991, the official name of the state has been Turkmenistan.

Under the 1992 Constitution, T. comprises the following administrative-territorial entities: five Velayats (regions): Akhal, Balkan, Dashoguz, Lebap, Mary; etraps (districts), which are shakher, where state administration bodies are established, and shakher equated with the etraps, settlements and oba, in which local government bodies are established. Turkmen account for 72% of the population, but there are also Russians, Uzbeks, Kazakhs, Tatars, Ukrainians, Azerbaijanis, Armenians, and Belujis. The official language is Turmenian (Oguz group of the Turk language family), which has a Latin alphabet. The main religion is Sunni Islam. The monetary unit is the Manat.

T. has diplomatic relations with the Russian Federation (established on 08.04.1992), and it is part of the CIS. Its main national holiday, October 27, is Independence Day. On 18.05.1992, the T. Supreme Council adopted a new Constitution proclaiming Turkmenistan a democracy and secular state. The head of state is a president elected by general direct elections for a period of 5 years. He is also the Supreme Commander-in-Chief of the country's armed forces. On 27.10.1990, S. Niyazov was elected the first president of the Republic. In 2007 G. Berdimuhamedov was elected as President. The highest representative organ is the Halk Maslakhaty (People's Council) of Turkmenistan. It is made of the President, deputies of Majlis, the Chairman of the Supreme Court, the Chairman of the Supreme Economic Court, the Prosecutor General, and members of the Cabinet of Ministers. Halk Maslakhaty reviews and passes decisions on the expediency of amending the Constitution, on holding referendums, on the formulation of major lines of country's development, for ratification and denunciation of treaties on state-to-state unions and other formations, and on other matters. The decisions of Halk Maslakhaty are implemented by the President, the Majlis, and other state bodies. The legislative body, the Majlis (Parliament), includes 50 deputies elected in territorial districts with roughly equal number of voters for 5 years. At present, the Democratic Party of Turkmenistan (DPT) is registered in Turkmenistan officially. The president of the DPT Political Board is G. Berdimuhamedov. The party was established in December of 1991.

Foreign policy is aimed at providing favorable conditions for the country's rapid economic development. Permanent neutrality is proclaimed as the fundamental principle of foreign policy. In December of 1995, at the 50th session of the UN General Assembly, a resolution was passed on the recognition of T.'s status of permanent neutrality. The republic has been a UN member from March 2, 1992; it also a member of the OEC, OIS, OSEC, the Non-Aligned Movement, AzDB, ESCAP, EBRD, IDB and other international organizations.

The country's economic development strategy was formulated in the program for the period of transition "10 Years of Stability." Its main goals and objectives consisted of transforming T. into a state with a strong socially-oriented market economy, providing real economic independence (above all, in the area of food availability), and restructuring the economy.

In terms of the total volume of production, products from the fuel-and-energy sector account for 27.5%, of machine-building for 5.1%, of the chemical industry for 5.4%, and of light industry for 41%. The most promising industry is fuel-and-energy. Light industry (cotton ginning) is also among the leading sectors.

The oil-extracting industry is connected with Nebit-Dag Oil Fields, where oil was produced more than 80 years ago. Subsequently, Kundag, Dagajik, and Aligul field in West Cheleken were discovered, along with Koturdepe, Barsa-Gelmes, Okarem, and Kamyshlyja fields. After T. gained independence, exploration began of the Caspian shelf with the aid of foreign companies. The oil-extracting industry made it possible to establish the oil-processing industry. In 1943, the equipment of Tuapse oil refinery was evacuated to Krasnovodsk (at present, Turkmenbashi). With that equipment, Krasnovodsk oil refinery was set up. At the end of 1990, refurbishment of the refinery began. A millisecond analytical cracking plant was installed, which was designed to process 1.8 million tons of oil and connected with it by a common processing flow diagram of a 900,000 t was a top-quality benzene plant. A 750,000 t of benzene per annum hydrofining and catalytic reforming plant has been commissioned.

A complex for the fabrication of lube oils of 80,000 t/annum and of polypropylene – 90,000 t/annum capacity has also been commissioned. This will enable Turkmenistan to meet fully its lube oil requirements and embark on production of polymers used to fabricate various products.

The gas-extraction industry was developed in the mid-1960s on the basis of Maiskoe, Okarem, Kumdag, Nzairi, and Gasojak fields. There are 127 total gas fields in T., the largest being Dovletabat-Donmez with 1.3 trillion cubic meter reserves and Yashlar with 0.76 trillion cubic meter reserves. T. is the starting point of the gas pipelines Central Asia–Central Russia, Central Asia–Urals. After the country gained independence, the first export gas pipeline Korpeje-Kut-Kui (Iran) was commissioned. It is regarded as the first stage of construction of the super gas pipeline Turkmenistan–Iran–Turkey–Europe. Besides, the question of laying the Trans-Afghan Gas Pipeline from T.'s major gas field via Afghanistan and Pakistan is still on the agenda. By the end of 2009 new gas pipelines to Iran and China were constructed.

There are also plants in T. manufacturing oil instrumentation, centrifugal pumps, chemical equipment, etc. The chemical industry fabricates such items as carbon back, sulfur, iodide, bromine, mineral fertilizer, chemical plant protection agents. Household chemistry goods, like synthetic detergents, are also fabricated. A building materials industry is being developed rapidly, as diverse and rich reserves of raw materials serve the basis for the production of cement, walling materials, asbestos-cement sheets and pipes, mineral cotton, sheet glass, brick, roofing tile, etc. The light industry is growing at a steady rate. Its component sectors include cotton ginning, primary treatment of wool, silk, textile, knitting, and carpet-weaving. Since independence, seven factories for the fabrication of cotton yarn, a jeans fabric factory, and a large hosiery factory have been built.

The food industry is represented by oil pressing (fabrication of vegetable oil), meat, vegetable-fruit canning, tobacco, and wine-making industries.

Agricultural lands are 82% of the total land area (largely ranges), while arable lands are only 3% of the total.

The agricultural land area is over 39 million hectares. The stock of lands suitable for farming reaches 12 million hectares, while highly fertile lands are 45 million hectares. The main plant-growing areas are in the valleys of the rivers Amudarya, Tedzhen, Murghab, and along the Karakum River. The main type of arable farming is irrigated agriculture. Total irrigated area is 1.7 mln ha (2009). The soil and climate conditions favor the cultivation (with irrigation) of the most valuable varieties of fine-fiber cotton. The country produces around 1,300 t of raw cotton. Irrigation canals: Karakum (the Karakum River links the Amudarya and Tedzhen, then flows on in the direction of the Caspian Sea, and its length is 1,300 km) and the Karshi Canal (links the Amudarya and Kashkadarya).

Nearly 40 thou km of header-and-drain network and other facilities have been built. The period of T. independence was characterized by an abrupt increase of grain production due to a partial reduction of land areas under cotton, which has made T. self-sufficient in grain. Widely practiced is the cultivation of vegetables and horticulture (apples, edible fig, pomegranate, apricots, plums, etc.), viticulture (for raisins and wine), and melons (melons, whose assortment includes over 200 species, including watermelons). In the southwest of T., in the subtropics, grow persimmons and common Indian jujubes (Chinese date). The semi-desert and desert area feature nomadic stock-breeding, especially sheep-raising, including karakul sheep. Turkmenistan produces silk in significant quantities, as well as wool and licorice. Camel herding, a typical desert industry, is also at an advanced stage of development. It is worthy of note that while camels were previously used for transportation and as pack animals, nowadays they are a source of meat, milk, and wool. Bee-keeping is practiced in the piedmont and mountain areas. T. has long been famous for the breeding of the recognized Akhaltekin and Iomud horse breeds.

Fishing is mainly in the Caspian Sea, but also in rivers and canals. Successfully acclimatized to the river system of the Amudarya-Murghab-Tedzhen are far-eastern commercial species: grass carp, silver carp, and white Amur bream. These species also assist in solving the problem of cleaning canals and water bodies from eutrophication.

The sprawling transport system includes railways, rivers, and automotive and air transports. Automotive transport has a special significance in freight transportation. The length of general-purpose motor roads is 15 thou km. Virtually all cities of the country are linked by motor roads. The highway Turkmenbashi-Ashkhabad – Turkmenabat is the main highway.

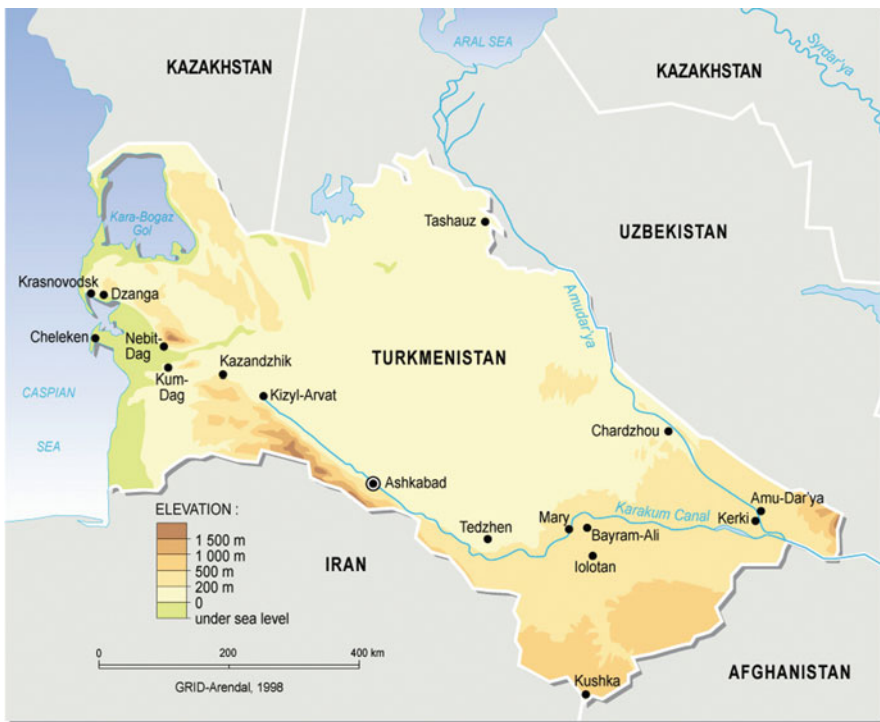
The forging of the railway system began late in the nineteenth century when the Trans-Caspian railway, linking Krasnovodsk with Tashkent, was built. At present, the length of railways is 3,000 km; the lines are single-track, except when the railways approach the major railway junctions at Ashkhabad and Turkmenabat. The main railway is the Turkmenbashi-Turkmenabat and Ashkhabad-Dashoguz. In future, the national railways will be linked with those of Turkey, Iran, Uzbekistan, Kyrgyzstan, Kazakhstan, and China to form a single transport route; this, in turn, will be part of the transcontinental railway line from the Chinese port Lianyungang

via Urumchi-Alma-Ata-Tashkent-Tehran-Istanbul-Budapest to Rotterdam. One of the stretches of this road Mashhad (Iran)-Tudzhen (Turkmenistan), 800 km long has already been built, of which 132 km runs over T. territory. Navigation exists on the Amudarya River, Karakum-River (the head section of the canal, over 800 km in length, is navigable), and on the Caspian Sea, which includes the non-freezing port at Turkmenbashi. The ferry terminal is also subject to full modernization. As of 1998, the port has been under reconstruction, the first remodeling effort since it was built more than 100 years ago. The port occupies an area of 400 thou m². The terminal is being developed, new jetties are being built, and the main dry-cargo wharf is being built virtually anew. A covered storehouse of 5 thou m² with a computerized control system and customs has been set up.

The sea railway ferry service Turkmenbashi-Baku (Azerbaijan) and Turkmenbashi-Olya (Russia) is operational.

There are a number of health resorts in the Republic: Bairam-Ali, Firyuza (climatic), Archman, Mollakara (balneal).

The CIS countries account for over 51.6% of T.'s foreign trade turn over. The main items of export remain gas and oil (98.6%), oil products, phosphorites, cotton fiber, electricity, karakul, carpets, and dried fruits. The primary trade partners are Turkey, Iran, Pakistan, Italy, Switzerland, USA, and Great Britain. T. exports mainly cotton to these countries (over 80% of all export).



Turkmenistan, topographic map. In *UNEP/GRID-Arendal Maps and Graphics Library*. Retrieved 21:26, May 22, 2009 from http://maps.grida.no/go/graphic/turkmenistan_topographic_map.

Tuzluk – pickle, water-based solution in which fish and (processed pressed) caviar are pickled at a fish-processing plants. Man-made T. is a solution of cooking salt in boiled water. Natural T. is moisture extracted from fish after its treatment with dry salt.

Twelve-Foot Road – outer road on the Caspian Sea, more than 3.5 m deep. The road is intended for transshipment of cargo from marine ships onto river vessels and vice-versa.

Tyub-Karagan – peninsula located on the western part of Mangyshlak Peninsula in the Kazakhstan part of the Caspian Sea. T.-K is a plateau dissected by ravines; deep in the peninsular mountains rises in places. In 1716, A. Bekovich-Cherkassky erected a fortress here, and in 1846, an expedition under the Colonel of General Staff M.M. Ivanin arrived here. Ivanin had laid the foundation of the Novo-Petrovskoe Fortification that provided protection of the Turkmen from the devastating incursions of the neighboring feudal states. Construction of the fortress was conducive to the expanding trade of Russia with the coastal population of Mangyshlak.

Tyub-Karagan Bay – its length is 11 km, and its width in the northern part is 9 km and in the southern part is up to 1.5 km, Kazakhstan. The southern and western shores of the bay are low-lying, while the eastern shores are mountainous. The bay is a well-protected berthing site for ships of varying draught. At the apex of the bay, separated by Tyub-Karagan Spit is Bautin Bight harboring a port of the same name.

Tyulenii Island – low-lying sandy island in the northwestern part of the Caspian Sea. Its length is around 5 km, and its width is less than 2 km. The island surface is essentially structured by sand stones with inclusions of shells. There is a settlement and a weather station on the island. Fishing (in summer) and sealing are pursued. The low-lying northern part of the island is covered with reeds. The eastern part is a flat coast.

Tyulenii Islands – group of small islands in the northeastern part of the Caspian Sea to the north of Mangyshlak Peninsula, so named due to widely practiced sealing here. The islands include: Kulaly (the largest island, with area around 68 km²), Morskoi, Podgorny, Novyi, and Rybachii. All the islands are narrow and stretch from the north to the south.

Tyulenka – local name of a small ship specializing in sealing.

U

Uch – a peninsula located 43 km to the north of Makhachkala, Daghestan. Its length is 82 km and its width is 3–4 km.

Uchug – a wooden picket wall constructed across a river bed for fishing in the arms of Volga and Ural rivers. U. may be permanent or temporary. In the middle of the wall there were made trapping “huts” or pools where sturgeons were entrapped. When necessary, the fish was taken out of these pools with the help of hand pikes. In the reign of Ivan IV (the Terrible), there were 3 uchugs on the Volga, and during the time of Peter I one more was constructed. All of these uchugs – Chagansky, Uvarinsky, Ivanchugsky, and Kamyzyaksky existed till the 1860s. The most famous was the Gurievsky U. constructed in the eighteenth to nineteenth centuries by Astrakhan fishery men. Initially U. had gates 6–8 *sazhen* in size (1 *sazhen* = 2.13 m) on both sides that were kept open, but later on it became a solid structure. Fish could run from the sea into the river only via lateral arms. On the demand of the Yaik Cossacks Gurievsky U. was destroyed in 1743. Until 1918, U. also existed near Uralsk City. It was constructed in summer and autumn so that the “red fish” did not run upstream beyond the confines of the Cossack lands. Natural scientist S.-G. Gmelin (1771) said that he witnessed how more than 500 great sturgeons weighing 40, 50, and even 70 *poods* (1 *pood* = 16.38 kg) were caught in only 2 h.

Ufra – an oil port in Turkmenbashi, Turkmenistan. The port receives crude oil and from here it is transported to the oil refinery works in Turkmenbashi.

Ulsky Alexander Fedorovich (1836–1868) – a graduate of the officer’s classes of the Marine Corps. He acquired extensive knowledge of astronomy under the guidance of O.V. Struve, the director of the Pulkovo’s Observatory. He plotted the first bathymetric scheme of the underwater Apsheron Sill and described in detail the Pirallahi (Artyom) Island located near the eastern coast of the Apsheron Peninsula. In 1862, in the southeast of the Caspian, he discovered and described the “Gryazny Vulkan” (Mud volcano) shoal. Studying the deeper part of the Caspian Sea, 42 km to the northeast of the “Gryazny Vulkan” shoal, U. found one more shoal that was not known before. It was called the Ulsky shoal. U. published his works “Preliminary Investigation of the Caspian Seabed” and “Results of the Caspian Sea Measurements in 1861–1862.” U. prepared the first bathymetric map of the Caspian. In 1867 he was given the rank of Lieutenant-Commander. He died at the age of 32.

Ulsky Shoal – located to the south-southwest of the southern tip of Ogurchinsky Island near the Turkmen coast. It was opened in 1897 and received its name in honor of A.F. Ulsky.

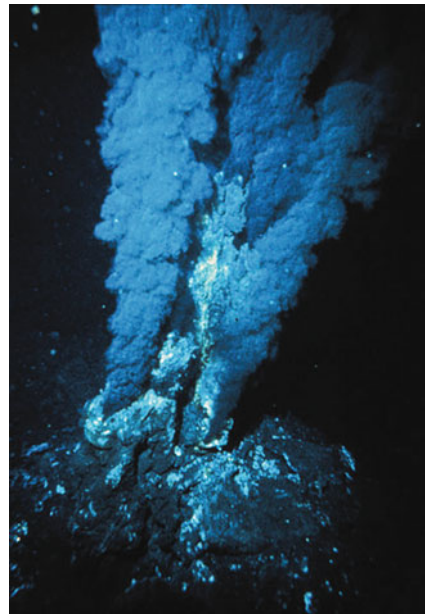
Ultraheavy Oil – variety of crude oil with a very high specific density (1.05 g/cm³ and higher) due to large amounts of heavy hydrocarbons.

UN Convention on the Law of the Sea, 1982 – elaborated by the 3rd UN Conference on the Law of the Sea in 1982. It is a set of mutually-acceptable agreements on major problems of World Ocean use, including external boundaries, territorial waters, and continental shelf regimes; the right of free passage of ships through straits; the regime of international seafloor area; etc. The Russian stand is that UN.C. may not be applied to the Caspian Sea as it is a unique water body that requires a special legal regime.

Underwater Sill – an extended and wide rise of the sea bottom connecting two separated land areas. In the Caspian Sea are the Mangyshlak Sill (between the Northern and Middle Caspian) and the Apsheron Sill (between the Middle and Southern Caspian).

Underwater Shoreface – a strip of the sea bottom adjoining the coastline (in nontidal seas, for example in the Caspian) that at the given average sea level is affected by sea waves.

Underwater Volcanism – volcanic activity under water that, because of hydrostatic pressure, are usually not perceptible. In shallow places, they are accompanied by releases of vapor, mud and lava. In the Southern Caspian, as much as 100 eruption



Underwater volcanism (http://zhurnal.lib.ru/img/s/stepanow_a_f/100/podwodnyj_wulkan.jpg)

cites may occur. In the Pogorelaya shoalbank (Southeastern Caspian), the amount of erupted mud may be as large as 5 million cubic meters a day, while for a year this figure may approach 2 km³.

Union of Soviet Socialist Republics, USSR, Soviet Union – state that existed on the greater part of the territory of the former Russian Empire from 1922–1991. Under the Agreement on establishment of USSR (30.12.1922), the union was made up of the Russian Soviet Federal Socialist Republics (RSFSR), Ukrainian SSR, Belorussian SSR, the Trans-Caucasian Soviet Federal Socialist Republic (TSFSR), from 1936 the Azerbaijan SSR and other Republics. Subsequently, the Turkmen SSR (1925), the Kazakh SSR (1938), and some other Republics were established. In December of 1991, the leaders of the Belorussian SSR, RSFSR, and Ukrainian SSR signed the Belovezhskie Agreements in which it was stated that the USSR ceased to exist and established the Agreement on the organization of the Commonwealth of Independent States (CIS) (8.12.1991, Minsk). Azerbaijan, Kazakhstan, Turkmenistan, and other Republics declared they were committed to the goals and principles of the Agreement on CIS establishment (21.12.1991, Alma–Ata). On 25.12.1991, the USSR ceased to exist as a subject of international law.

Upstream – one of three segments of the energy industry related to generation of power resources. In the oil and gas industry, this segment includes oil and gas exploration and production.

Upwelling (from English *upwelling*, *up* – “to the top” and *well* – “a source”) – rise of deep waters to the sea surface. In the world oceans, the most widespread is the phenomenon of coastal U., which is induced by a steady wind blowing along the coast when the coast is to the left of the wind direction (in the Northern Hemisphere). Wind-driven currents are diverted to the right of the winds in the Northern Hemisphere and to the left in the Southern Hemisphere due to the Coriolis effect. The result is a net movement of surface water at right angles to the direction of the wind, known as the Ekman transport. When Ekman transport is occurring away from the coast, surface waters moving away are replaced by deeper, colder, and denser water. Deep waters are rich in nutrients, including nitrate and phosphate. A frontal zone is formed that separates waters with different temperature and density.

Coastal U. is observed in the summer season in the Middle Caspian both along the eastern and western shores. The nature of processes developing in these regions differs essentially, however. Near the western coast of the Middle Caspian from Makhachkala to Cape Kilyazinskaya Kosa, U. is quite rarely generated in summer by southeastern winds – 3 or 4 times a year. The upwelling period lasts for several days, and the temperature drops by 5–6° on average. But near Makhachkala and Derbent, sharp short-time drops of a water temperature of 10–15° have been recorded. Therefore, water rising along the western coast of the Middle Caspian occurs seldom, being a local phenomenon that does not particularly affect the seasonal changes of the water temperature. Among the causes of such seldom U. near

the western coast of the sea there is a steady southeastern current that may alleviate the effect of the wind (favorable for U.) of the opposite direction. In addition, the frequency of southeastern winds in summer is twice as less as of northwestern winds that cause U. in the eastern coast of the Middle Caspian.

Along the eastern coast of the sea, U. is observed within a strip up to 50 km wide from the Mangyshlak Peninsula to Kara-Bogaz-Gol Bay. It begins in June and reaches the peak of its intensity in July–August. Northwestern winds (favorable for U.) are characterized in the summertime not only by great recurrence in a year (25%), but by great stability as well. They may blow with speeds of 4–10 m/s for up to 10 days without interruption. That is why U. in the eastern part of the Middle Caspian has a seasonal nature. Its recurrence and duration are such that water does not have enough time to heat up to the mean-monthly values and a temperature lowering during U. prevails over seasonal sea heating.

From the outer border of the U. zone (isotherm 23°C) in the direction to the coast the water temperature lowers to 12–15° and at times even more. This U. is clearly seen on all maps of average temperatures and is easily traced on satellite infra-red images. The most intensive rise of deep waters is witnessed in the narrow coastal strip to 30 km wide, largely from water horizons lying at depths of 20–40 m. These waters, having a temperature of 10–15° and a salinity of 12.7–12.9‰, move to the open sea and form an U. front with sharp thermal gradients. Indirect estimations of vertical water motion during U. have revealed such high values as 10^{-3} – 10^{-2} cm·s⁻¹, which confirms a possibility of U. formation within several days. The processes of water rise are complicated to a great extent by the effect of the coast and bottom relief. Its corrugation facilitates formation of local U. centers with the lowest temperature near Capes Peschanyi and Rakushechnyi. It should be noted that in different years, depending on a nature of winds, the U. intensity may change significantly. By the results of oceanographic surveys, there were years when temperature anomalies in the eastern part of the Caspian did not reveal themselves at all.

A system of seasonal U. on the Caspian can be identified not only by hydrological conditions, but also by chemical and biological parameters. In the course of water rise, the top layer of the sea becomes enriched with nutrients, coming up from the deep zone where they accumulate. Thus, the concentration of silicon in open sea on the surface is 200–300 µg/l, while in the U. zone it increases to 500–1,000, sometimes up to 2,000 µg/l. The concentration of dissolved oxygen and pH in the area of rising water is lower than in the open sea, which also shows the effect of water uplift to the sea surface from the deeper layers. As a result of the enrichment of the sea surface layer in the U. regions with U. favorable after winds, an increased content of zooplankton is observed and this, in its turn, favors movement of kilka to the coast. For opposite southeastern winds the situation is vice versa – the biomass of zooplankton decreases and kilka move away from the shore.

Seasonal U., developing on the eastern shelf of the Middle Caspian, plays an important role in formation of a hydrological structure of the Caspian waters. It radically changes the dynamic regime of the whole deep-water basin activating various baroclinic processes.

Ural (before 1775 Yaik) – the river flowing into the Northern Caspian lower than Atyrau, Kazakhstan. In the times of Ibn-Battuty, it had the name Ulu-Su (“big water”). After the Pugachev riot, Ekaterina II issued a decree to rename the river into Ural. The length of the river is 2,428 km, and its watershed area is 231 thou km². It is one of the biggest rivers in Kazakhstan. U. takes its origin on the western slopes of the Uraltau ridge, not far from the sources of the Belaya River in Russia. It flows over the territory of the Republic of Bashkortostan, Chelyabinsk Region, Orenburg Region in the Russian Federation, and then crosses the border with the Republic of Kazakhstan where it flows through western Kazakhstan and the Atyrau Regions. In its lower reaches, the river is a border between Europe and Asia. By the nature of its flow, U. is divided into 3 parts: Upper U. – as far as Orsk City, Middle U. – from Orsk to Uralsk City, and Lower U. – from Uralsk to the mouth. In its upper reaches, U. runs along the eastern slopes of the Southern Ural, mostly in the narrow valley. Downstream from Verkhneursk City it acquires the features of a plain river. In the vicinity of Magnitogorsk, the river has a reservoir providing water to the Magnitogorsk metallurgical plant. Still further downstream, U. flows over cliffy shores and in this part many shallows are found. Near the Irikliny settlement, a hydropower plant with the Irikliny reservoir is built. In the upper reaches, U. receives such tributaries as Tanalyk (right) and Or’ (left). Downstream of Orsk, the river flows through the narrows in the Guberlinsky Mountains (for 45 km). Downstream from the inflow of the Sakmary River (on the right), the valley gradually widens to several dozens kilometers. From here, U. becomes a typical plain river. In this stretch U. receives the Ilek River – a left tributary. In the lower stretch from Uralsk (Kazakhstan) and further downstream U. has a wide valley and a vast floodplain with numerous branches, old channels, and pools. Downstream of Uralsk, the Kushumsky canal and a reservoir were constructed. In its mouth, U. is split into two arms – Yaitsky and Zolotoy (navigable). In 1769, there were 19 arms. Regardless of a considerable watershed area U. is not water abundant. Its average annual flow is about 6.6 km³, and its sediment flow is 2.7 million ton per year. It is fed mostly by snow (approximately 80% of the runoff). The river freezes in its upper reaches in early November and in the middle and lower reaches in late November. The thaw moves from the lower to the upper reaches and lasts till late March to early April. Historian V.N. Tatischev wrote the following, “This river is considered to be the most fish abundant in the state.” The main commercial fish here: sturgeon, starred sturgeon, herring, pike perch, bream, common carp, and catfish. In the eighteenth century, the river had the most fish catches in Russia. Here, the system of Cossack fishing was introduced. U. is navigable as far as Uralsk (about 900 km); however, in the summertime the shipping is impeded due to numerous shallows and bars appearing here.

In 1978 the lower reaches of U. became a nature preserve area.

Ural-Caspian Canal – was constructed for passage of vessels from the Guriev roads to Atyrau (formerly Guriev) in Kazakhstan. Its length is 51.5 km. Marine and river parts of UCC are distinguished. The marine part of the canal (18.5 km) goes from the Guriev roads as far as the Peshnoy Peninsula, while the river part (33 km)

goes from the Peshnoy Peninsula as far as Atyrau. This part of the canal runs along the Zolotoy arm (being its continuation), the deepest arm in the Ural River delta, and along the Ural River. The canal depth is 1.8 m (1958).

Ural-Caspian Division of CaspNIRKh (1988–1992) – established to evaluate the reserves and assess the efficiency of natural reproduction of sturgeons and bone fish in the Ural River. Together with CaspNIRKh this Division took part in preparation of the sturgeon catches forecast in the Ural River. The Division was located in Atyrau, Kazakhstan.

Ural-Caspian Research Fishery Institute – at present it is reorganized into the Small State Research Enterprise. It is subordinate to the Fishery Committee at the Ministry of Agriculture of the Kazakhstan Republic.

Ural Cossack Troops – before 1775 they were called the Yaik Cossack Troops and were renamed after suppression of the riot led by E.I. Pugachev. Their center was Uralsk City. In 1916, the Cossack population numbered approximately 174 thou, and they possessed over 6.4 million dessiatines of land (one dessiatine = 2.7 acres). In 1920 they were abolished.

Ural River Delta – begins 11 km downstream of Atyrau City, Kazakhstan, where the small bypass Peretaska branches off to the left of the main channel. A V-type segment, its width in the lower part is up to 100 km, 60 km in the upper part, at an altitude of around 80 m. The deltaic plain surface elevations in the north are $-12 \sim -18$ m, and the water edge in the south is -26.9 m (1994). Essentially, this is a system of the Ural River with superimposed deltas of varying age alternating with segments of the marine plain and formed during the late- and post-Khvalyn period as a result of the Caspian Sea level fluctuations. The most recent small Guriev delta, with the apex of the triangle in the area of Atyrau City, was formed during the last century; its surface corresponds to the level of the high flood plain. At present, nearly half of it is submerged.

The annual Ural River level fluctuations in the delta are: spring flood, summer-autumn low water period, small autumn flood, and winter low water period. The spring flood is observed from the end of March–April until July–August and constitutes the main phase in the water level regime. The duration of spring flood near Atyrau City averages 30 days, and during high water years, rise of the water level may be observed for more than 2 months. During the summer-autumn low-water period, the water levels are low; in October, a certain rise of the water level is sometimes noted which is conditioned by the autumn rain-induced floods in the upper reaches of the river. During the winter low-water period, the water levels of the river are low.

The deltaic plain is relatively flat, crossed by guts, abandoned channels, and small lakes. The deposits structuring these are light loams and clays with 1–3 m thick interlayers of sand. In the southwestern part of the Ural River delta, the topography is ridged and hollow. The ridges (Baer's hills) are 2–3 km long and 2–3 m high. Their summits are often split and blown over. In the southeastern part, the relief is

more uniform, with random alternation of areas of varying altitudinal levels, areas of flood plain and liman levels that are inundated during the periods of floods and during the period of upsurge winds.

Uralskaya (Ural) Borozdina – a vast furrow in the Caspian Sea bed between the Ural delta and the Mangyshlak Bay, Kazakhstan. It runs for dozens of kilometers in a southwesterly direction from the offshore edge of the Ural River mouth. The furrow, the width of which is comparable with the Ural River valley width, is 9–12 m deep with surrounding depths not exceeding 5 m. Here, the westward or southwestward and eastward or northeastward currents prevail and weak anticyclonic movements of water may also be observed. The average current velocity is 10–15 cm/s. In spring during ice melting in the Northern Caspian, the floating ice in U.B. is the last to thaw (in April).

Ust-Kura Canal – connects the southeastern arm of the Kura River with the Salyansky roads of the Caspian Sea, Azerbaijan. The canal length is 3.5 km, and its width is 60 m, with a minimum depth of 2.2 m (1965). The depths of the canal are varying.

Uzboi – name of the dead valleys and dry channels in the desert regions of Central Asia. An ancient river valley connecting the Sarykamysch Depression with the Caspian Sea 550 km long, up to 4 km wide, and 55 m deep. It runs along the north-western margins of the Karakum from the Sarykamysch Depression to the Caspian Sea, i.e. from the southeastern end of the Ustyurt Plateau to the Kolkor solonchak that still, at the end of the nineteenth century, was a bay of the Caspian Sea.

In the Neogene Period (approximately 10 million years ago), a tectonic fault was formed along the present U. Later it turned into a river channel. About 9 thou years ago the Amudarya flowed into the tectonic Sarykamysch Depression. Its waters, having filled the depression, flowed over into the tectonic depression of U. and ran along it to the Caspian Sea. At present U. is dry. In some places, saline lakes and thick salt formations are found. Many ancient authors from Herodotus to Ammian Marcellinus and some other scholars of the tenth, eleventh, and fifteenth centuries asserted that the Oxus (name of the Amudarya in the ancient times) flowed into the Caspian Sea. Studying the Caspian Sea, however, Patroclus (285–282 B.C.E.) came to a conclusion that the Oxus (Amudarya) and Yaksart (Syrdarya) flowed into the Caspian. Proceeding from Patroclus conclusions, Eratosphen (275–194 B.C.E.) and Strabon spoke about the Oxus and Yaksart flowing into the Caspian from the east. According to Strabon, the Oxus was the largest river to his knowledge, apart from the Indian rivers. Eudox (third century B.C.E.) mentioned an enormous waterfall at the Oxus inflow into the sea. Polybius (208–127 B.C.E.) knew about this, too. Historian Arrian (second century C.E.) wrote about inflow of navigable rivers into the Caspian. The Greeks considered the Oxus and Yaksart to be among these. A. Biruni (971–1048) described the Zheikhuna (Amudarya) flowing through the deserts to the Khazar Sea. Idrisi (twelfth century) called U. the “greatest world river both by the volume and depth of waters and by riverbed width.”

It should be remembered that by the eighth century the Arabs went around the Caspian from the north, moving from Turkestan to the Caucasus, and, consequently, they compared their personal impressions about the Volga and Uzboi. The Uzboi River, the significance of which for the later water budget of the Caspian we have so far underestimated, was in the not so distant past only inferior to the Volga River and in some time periods it even surpassed it.

In the work “Amu and Uzboi” (Samara, 1879) it was mentioned that before Peter I, the Amudarya was presented on all maps as a tributary of the Caspian Sea, and only Peter I informed the French Academy of Sciences about diversion by the Khiva Government of the Amudarya waters into the Aral Sea. Kaulbars stated that the Amudarya deviation may be dated between 1470 and 1575. In some periods it was proposed to connect once again the Amudarya with the Caspian Sea via U. A hypothesis that in ancient times the Oxus flowed into the Caspian Sea was refuted by many. Regarding the historical flow of the Amudarya (from 54 km³ in 1986 to 105 km³ in 1969), it can be assumed that it could play a significant role in variations of the water level in the Caspian Sea.

Uzek, Ozek – a narrow branch (Turk), an arm, an old channel.

V

Vilyazhchay – the largest river flowing into Kyzylagach Bay in the Azerbaijan Republic. Originates in the Savash-Gyanduk Range bordering Iran and Azerbaijan. V. flows mainly in the mountainous area, and only its small part, from the foot of Tambinau Mountain, flows over the plain. V. has a great many tributaries in the form of small mountain rivulets. Primary source of feeding is rains. During the autumn-winter period, precipitation is abundant here. Throughout its course, V.'s channel is 5–7 m wide. River depths range from 0.2 to 0.5 m. Most of the area of river confluence with the bay is water-logged. In the past, the V. was significant in terms of fishery development.

Voinovich Marko Ivanovich (1750–1807) – Russian hydrographer. Born in Montenegro. As a youth, he was conscripted for military service in the Republic of Venice. As a serviceman, he committed a serious delinquency and was sentenced to death by hanging. V. escaped from prison, and enlisted in the Russian fleet as a volunteer. He made his mark in the Archipelago expedition, was promoted to the rank of a Lieutenant, and was assigned as a frigate commanding officer. As a Lieutenant Commander, V. was introduced to G.Potemkin and Empress Catherine II. After the title of a Count was conferred on him, V. became the commanding officer of the Empress' own yacht. An expedition under his command was sent to the Caspian Sea in 1781. V. was commissioned to find the most suitable site to deploy a Russian trade base with a view to bringing traders from India and other oriental countries. In the summer of 1781, V.'s fleet debarked on the shore of Astrabad Bay, Persia. A fortress had been built here; however, Aga-Mohammad Kajar, the ruler of Mazandaran, Astrabad, and Gilan devised a ruse to lure V. and his closest officers to come and visit him as his guests ... and put them into a dungeon. When Catherine II learned about this, she ordered the fortress to be razed to the ground and the fleet to return to Astrakhan. The fortress was ruined, and V. and his officers were freed. V.'s fleet stayed in the bay until the summer of 1782 and examined the bay in detail. For his activity on the Caspian Sea and on the Persian coasts, V. was promoted from Captain II rank to Captain I rank. In 1783, V. was transferred to the Black Sea fleet. From 1787 to 1789, during the Russian-Turkish war in the rank of a Rear Admiral

at first, V. was the head of the Sevastopol Fleet, then he was Commander of the Black Sea Fleet and also a member of a Department at the Admiralty. In 1790, V. was again transferred to the Caspian Sea and a year later he resigned. In 1796, V. rejoined the fleet and served there (1801) until he became a full Admiral. In 1805, V. resigned for the second time.

Volga – in ancient times known as Ra – “generous”, also *Ranga* (Avesta, fourth to fifth centuries B.C.E., Zoroaster). Ptolemy (90–168) wrote: “The Volga is made up of two rivers: the Kama in the east and the Volga proper in the west”; later the Greek scholar Agaphemer wrote: Ros (on its banks there live Rossolany people belonging to the group of Scythian peoples); medieval Muslim scholars (Arab and Persian), including A. Masudi, Kh.Kazvini, and Ibn-Fadlana, refer to the river as *Itil*, *Ethel*, *Idel*, *Idul*, *Atel*, and *Edel*; in Europe with rare references as *Astil* and *Ledil*. The Arab tenth century geographer Ibn-Haukal referred to the Volga as the “river of the Rusens.” Masudi also used the name of *Hazar River* (Hazars lived in the lower reaches). The name of *Itil* is encountered in the works of the Armenian historian, Movses Khorenatsi (fifth century C.E.). In the works of the Byzantine Emperor Constantin Porfyrorodnyi (ninth century C.E.), the Volga is referred to as *Atel*; in the works of Rubruk – as *Etil*; of Marco Polo – as *Ergil*. Some authors relate the name of *Itil* to that of the Huns’ Chief Atilla. The Russian name Volga is a Finnish word, meaning “holy.” Tatar writers refer to the Volga as *Bulga*, apparently relating it to the name of the people belonging to the Turk tribe of Bulgars, their Kingdom and main city Bulgar.

The Volga is Europe’s largest river, and the pride of Russia. The rivers length is 3,531 km. Its catchment area is 1,358 thou km² (62.2% of the European part and 8% of all Russian territory, i.e. nearly 13% of Europe’s area). The catchment area encompasses fully or partially 41 administrative entities, of these, 2 are in Kazakhstan, while the rest are in Russia (20 regions, 9 republics, 1 territory, Moscow, and others).

The Volga originates in Valdai Upland and flows into the Caspian Sea. The river basin is within the Russian Plain between the 62° and 45°N and 36° and 62°E. The length of the river basin from the north to the south is around 2.5 thou km, from the west to the east nearly 2.3 thou km. The Volga is restrained by dams with 11 hydroelectric plants. The basin area is characterized by the alternation of lowland plains (Upper Volga, Vetluga-Unzha, Meshchera, Caspian Plains and others) and uplands. The basin is located within the absolute elevations of 100–300 m, yet there are exceptions: in the south, in the Caspian Lowland, it is at 30–40 m elevation, and in the upper reaches of the Belaya River at 300–400 m. As the Volga flows, it crosses several different zones: forest zone (as far as Kazan), forest-steppe (as far as Samara), steppe (as far as Volgograd) and semi-desert-desert zone (as far as the Caspian Sea).

Hydrological regime is formed mainly by tributaries flowing into the V. 2,600 rivers flow into the V. directly, while the total number of water courses (i.e. rivers

longer than 10 km) in the basin is more than 150 thou. Catchments of small rivers make 45% of the total catchment area in the basin. The left-hand tributaries of the V. (especially those downstream of N. Novgorod) are more numerous and more copious than the right-hand ones. Of these, the largest are the Mologa and the Sheksna (both flow into the Rybinsk Storage Reservoir), Kostroma, Unzha, Vetluga, Kama, Samara, and Bolshoi Irgiz. Among the right-hand ones are the Oka, Sura, and Sviyaga. The primary feeding sources of the V. are snow (60%), groundwater (30%), and rains (10%). The V.'s natural hydrological regime is characterized by a spring flood (April–June), low water during the summer and winter droughts, and autumn rainfall floods in October–November.

The V. has always been important as far as trade is concerned. During the ninth to thirteenth centuries, it linked Russians with Bulgars and Turk tribes (grain trade), whose domains stretched along the Middle and Lower Volga and the Kama. In the thirteenth to fourteenth centuries, a stable assortment of trade along the Volga was established in Russia. Down the V. furs were exported (these reached Derbent and Baghdad), along with honey, wax, walrus tusk, leathers, and plain-woven fabrics. Up the V. salt, spices, silks, precious stones, precious metals, semi-precious stones, pearls, and weapons were imported. When Ivan the Terrible seized Kazan (1552) and Astrakhan (1556), the water-way along the V. became Moscow-controlled over its entire length. The Astrakhan trade that linked Russia via the Caspian Sea (Khvalynsk Sea) with Central Asian khanates, Persia, India grew much more bustling. At that time, the Volga fish industry became quite important. In the seventeenth century, V. and its tributaries asserted themselves as the backbone of all Russian trade, and V. itself was a very busy main trade route. In the eighteenth century, V. flowed under the walls of Astrakhan Kremlin. For several ages prior to that, the primary flow of the river had kept moving westward. In the sixteenth century, A. Jenkinson traveled to the Caspian Sea down the deep and water-abundant V. arm Bolde, but Adam Olearius was already unable to use the same route in the seventeenth century. He traveled more to the west, down the Ivanchug arm. In the eighteenth and early nineteenth century, the V. itself was used as the way to the Caspian Sea, but then its channel began to fill with sediments and was increasingly divided into arms. For this reason, the navigable channel had to be moved more to the west – to Bakhtemir.

In the eighteenth century, the V. was “the basis of all communications of the Russian Empire, and, hence, the basis of all commerce”. In the nineteenth century, the V. was linked with Petersburg via the Tikhvin (1811) and Mariinsk (1810) systems. This was followed by the commencement of construction of a connection between the Volga and Moscow along the Sestra River and Istra River and of a canal between these two. During the 1840s, steamships arrived on the Volga; however, the functioning of the V. as the primary trade communication of Russia was hindered by the “primitive natural state” of the river, especially the phenomena of insufficient waters and shallowing. Besides, in order to further economic growth of Russia, navigable links of the V. with the rivers of adjoining basins, the Dnieper and the Don, were required.

The V. valley (upstream of Volgograd) has been transformed into a chain of storage reservoirs formed by the dams of hydropower Plants (1930s). Data of instrumental observations indicate that during the period from 1882 to 1994, the V. flow, both seasonal and long-term, was not uniform: the mean long-term discharge of the V. (at Volgograd site) was 8,000 m³/s; the mean annual discharge during low-water year (1921) was 5,000 m³/s and during a high-water year (1926) was 12,000 m³/s; minimum average monthly discharge in summer was 2,100 m³/s, while in winter it was 1,100 m³/s; maximum affluent (June 1, 1926) was 59,000 m³/s. In the long-term discharge record, periods of enhanced and reduced stream-flow rates can be traced. The runoff figure for the period of 1922/1923–1929/1930 amounted to 297 km³/annum, 1933/1934–1940/1941 – 190 km³/annum, 1978/1979–1990/1991 – 287 km³/annum. Mean long-term flow of the V. is around 241 km³/annum.

Prior to regulation, the V. used to flood many kilometers away from the channel. There were years when the water level in the river at Volgograd rose by 8–8.5 m, while at Astrakhan it rose by 5.5 m, inundating the low-lying lands. Nowadays, spring floods never occur downstream of Volgograd. The only echoes of the past are fluctuations of the water level in the river caused by upsurges and downsurges from the Caspian Sea. The southerly wind (*moryana*) raises the water at Astrakhan by 2 m and more above the zero water level, producing a backward flow in the V. The “tides” caused by *moryana* reach Enotaevsk City. Northerly winds are capable of reducing the river level at Astrakhan by 80 cm; as they are, the fresh Volga water surge can be traced 55 km away in the sea.

Fluctuations of the V. runoff rate are accompanied by the parallel variations of the Caspian Sea level. While early in the twentieth century, the importance of the V. was virtually reduced to transportation functions, in the 1930s this importance increased substantially due to the construction of major hydroelectric complexes that made it possible to promote economic development in all Volga regions and improve navigation on the V. significantly. In the 1930s, the implementation of the “Grand Volga Scheme” commenced: the project envisaged the construction on the Volga and its largest tributaries of several dams with powerful hydroelectric plants (HEP) and large ship locks. To regulate river flow, the construction of huge storage reservoirs was planned. As a result, the following storage reservoirs were built: Ivan’kovo (1937, HEP – 30 thou kW), Uglich (1939–1943, HEP – 110 thou kW), Rybinsk (1940–1949, HEP – 330 thou kW), Gor’ky (1955–1957, HEP – 520 thou kW), Cheboksary (1968–1986, HEP – 1.4 mln kW), Kuibyshev (1955–1957, HEP – 2.3 mln kW), Saratov (1967–1968, Balakovo HEP – 1.2 mln kW), Volgograd (1958–1960, HEP – 2.5 mln kW). Additionally, 3 storage reservoirs were built on the Kama River: Kama (1954–1955), Votkinsk (1961–1964), Nizhnekamsk (1978). Furthermore, smaller storage reservoirs exist in the Volga basin, in particular around 800 reservoirs each with capacity of over 1 million cubic meter. The establishment of the Volga-Kama cascade of hydroelectric complexes with combined volume of regulated storage capacity of around 168 km³ led to substantial redistribution of

the runoff. The ratio of year-to-year flood-induced flow fell from 65% in natural conditions to 42%, while the winter flow tripled: from 9–10% to 27%. This, coupled with large area of spawning grounds cut off by the dams, resulted in the aggravation of conditions necessary for the reproduction of valuable species of anadromous and semi-anadromous fish, in particular of sturgeon species. This notwithstanding, after the Volga-Kama cascade was built and after the waterways linking the Caspian, Azov, White, and Baltic seas were built and remodeled, the Volga water management system (WMS) was established, unique not only on the scale of Russia, but of the whole world, too. The Volga WMS is a key component of the economic, social and environmental system of the V. and North Caspian basin.

The Volga-Kama HEPs generates 36 billion kilowatts per hour of electricity during a year of mean rate of water discharge, which accounts for one fourth of annual power generation of all Russian HEPs. The V. basin water transport handles 70% of all passengers and freight carried by river transport in Russia. This is a unified system of navigation more than 4 thousand km long with guaranteed depths of 4 m that are maintained by storage reservoirs regulation and special water releases to the downstream areas. The Volga water is used to irrigate 2 million hectare of land. The storage reservoirs provide for the catch of around 300 thousand quintals of fish (potential catch – 500 thousand quintals). 75 fish species inhabit the V., out of which 40 are commercial species (the crucial ones being: roach, herring, bream, pike perch, carp, sheatfish, sabrefish, pike, sturgeon, starlet).

There are around 20 thousand water intakes and 5.5 thousand water outlets in the V. basin, providing for the needs of industry, thermal power industry, drinking water supply, and irrigation. Hydrotechnical engineering transformed fundamentally the conditions for large-boat navigation. Greater depth, channel straightening, sharp reduction of dredging work, greater size of ships, and other advantages have made it possible to increase cargo turnover considerably. The importance of the V. as a transportation route has been enhanced thanks to the construction of major canals that link the V. with the Baltic Sea by means of the Volga-Baltic waterway, Vyshnevolotsk and Tikhvin systems; with the White Sea, via the North-Dvina systems and Belomor-Baltic Canal; and with the Black Sea and the Sea of Azov, via Volga-Don Canal. There are over 900 ports, piers, and mooring berths on the V. banks. The main cities and ports (from the upper reaches to the mouth) are: Tver, Rybinsk, Yaroslavl, Kostroma, Nizhny Novgorod, Cheboksary, Kazan, Ulyanovsk, Togliatti, Samara, Saratov, Volgograd, Astrakhan.

Among the crucial factors that were conducive to economic growth of the Volga Region and consolidation of relations with other regions of the country, alongside power industry and enhanced importance of the V. for transportation, the discovery in the 1920s–1930s of major fields in the Volga-Urals oil- and gas- bearing area. Later, Russia's major area of oil-extracting and oil-processing industry took shape here.



Volga watershed (<http://seagrizdesigns.com/sevenrivers/images/volgamap.jpg>) (=volga1.tiff)



Volga river (<http://club.foto.ru/gallery/images/photo/2009/01/17/1263005.jpg>) (=volga2.tiff)

Volga-Akhtuba Flood Plain – an area between the Volga and its left arm Akhtuba (in Tartar language, *Ak-Tyube* – “white hills”) dissected by guts and abandoned channels. The width of the Volga valley in the VAFP area reaches 20–30 km. In spring, the flood plain is inundated with water that brings fertile river mud.

Volga-Baltic Waterway – internal waterway linking the Volga basin with the Baltic Sea. At first, the VBW passed upstream, repeating the Vyshnevolotsk system; later, the Tikhvin and Mariinsk systems were built; the latter is operative to this day. The VBW comprises the Rybinsk Storage Reservoir (from Perebor to Cherepovets), the locked segment of the Sheksna River (from Cherepovets to Chaika), the Beloozersk Canal (with locks), the locked segment of the Kovzha River, the water divided Novo-Mariinsk Canal, the downstream segment of the Vytegra River with numerous locks (the so-called part of the system abounding in locks), Onega Lake, and the Svir’ River with two hydroelectric complexes, Ladoga Lake and the Neva River. The waterway’s overall length is around 1,100 km.

The VBW is linked with the North-Dvina System that originates 130 km upstream of Cherepovets (Toporninsky Canal) and via Onega Lake – with the Belomor-Baltic Canal.

Volga-Caspian Naval Flotilla – naval force as part of the former Soviet Navy was operational from July 1919 to July 1920. Formed as a result of merging the Volga and Astrakhan-Caspian Naval Flotillas. Participated in the defense of Astrakhan, in military operations in the Trans-Caucasus, and on the Caspian Sea.

Volga-Caspian Sea Basin – unique natural system formed by the Volga basin, Russia’s environmentally crucial area, and the Caspian Sea.

“Volga Delta” – one of Russia’s 35 wetlands which, under a Decree of the RF dated 14.04.1994, is of international importance. This wetland also includes the Astrakhan Biosphere Reserve. VD stretches over Limansky, Kamyzyaksky, Ikryaninsky, and Volodarsky administrative Districts of the Astrakhan Region. The wetland area is 800 thou ha at an altitude of –25 ~ –27 m.

The wetland is a delta area dominated by a complex of islands covered by cattail-tail thickets, with inclusion of willow forests, patterned cane and bur-reed thickets, open water areas, and flooded grasslands. Nesting grounds of water fowl and mass spawning of anadromous and semi-anadromous fish species as well as migration routes of the sturgeon populations. Economic activity involving the use of water bioresources, paddy culture, and wetland tourism and recreation in the wetland are restricted.

The Astrakhan State Biosphere Reserve occupies an area of 72.5 thou ha in 3 land plots. Four hunting reserves of 38.2 thou ha total area are organized, and “calm zones” for water fowl during the hunting season are established. There are natural monuments within the VD, such as “Bandurinsky”, “Khazovsky” and “Estakadny”. Besides, there are 11 hunting reserves in the VD lower reaches.

Biodiversity in the VD is protected by specially authorized state bodies: hunting surveillance service, fish protection and nature conservation bodies, as well as

hunting service of the State Nature Reserve, all of which draw on public organizations and police forces.

Volga Herring, Volga Multirakered Herring (*Alosa kessleri volgensis*) – anadromous fish. The back is of dark-green or olive-green coloring. Behind the operculum, there is nearly always a black spot, another spot but not distinctly outlined, is between the eye and the operculum's upper edge. There are from 90 to 150 gill rakers, which are relatively long and thin. The teeth are poorly developed, at times almost invisible. It has 48–54 vertebrae. The herring goes into the Volga (as far as the Volga HEP), less frequently into the Ural, and rarely into the Terek. The herring is encountered anywhere in the sea from the southern to northern shores, also from the west to the east. It winters in the South Caspian, occasionally in the Middle Caspian; in February–March, the herring begins its run to the north. The body length of sexually mature individuals is from 19 to 39 cm. Its mass is from 100 to 600 g. Females are larger than males. Fat content of VH is 6–10%. Its lifetime is up to 6 years. In April, VH enters the North Caspian and comes to the pre-mouth space and to Volga delta, with some stocks going as far as the Ural. VH enters the Volga mainly in May at water temperatures of 12–17°C. Then, it goes upstream at a speed of 10–30 km/day. VH spawns in May to early June at water temperature of 13–24°C, the peak of spawning occurring at 15–19°C. The spawning is noted essentially during the evening hours. The main spawning grounds are between Astrakhan and the Volga dam. As far as the Ural River is concerned, VH travels up to 300 km, spawning anywhere in its lower reaches. There are years when spawning takes place in the pre-mouth space of the Volga in fresh or brackish water, its salinity up to 1‰. With spawning over, VH runs into the sea in June. Some fish spawn up to 3–4 times during a lifetime. Young fish run into the pre-mouth space in July, and by September–October they leave the North Caspian Sea for the south. VH feed mainly on Crustacea as well as on small-sized fish like kilkas and gobies. VH eats while on the run. It constitutes the basis of herring industry on the Caspian Sea. VH produces cross-breeds with blackback shad.

Volga-Kama Bank – joint-stock commercial bank established in 1870 in Petersburg at the initiative of V.A. Kokorev. By 1873, VKB had 18 provincial branches, and early in the twentieth century it had 61. Sponsored oil (“Baku Petroleum Society”) and flour-mill industry enterprises, transport companies (“Samolet” (“Airplane” in English) and others), insurance companies (“Russian Lloyd” and others), and the Vladikavkaz Railway. Until early in the twentieth century, Russia's major commercial bank, then its influence began to wane, and in 1917 it was partly controlled by the Corporation of the Putilovs-Stakheevs. In 1913, annual turnover of VKB equaled Rbls. 21.7 billion.

Volga Mouth Area – one of the world's largest watersheds, it covers as of the late twentieth century, an area of 49 thou km² and comprises a delta of 11 thou km² and a mouth offshore of 38 thou km².

Volga Mouth Offshore Area – a part of the Volga mouth area. The most typical features of V.M.O.A. are vast expanses and shallowness. It lies within the following borders: eastern line from the Djambaisko-Novinsky Islands in the north to the northern tip of the Kulaly Island in the south, about 150 km long. The same line divides the eastern and western parts of the Northern Caspian. V.M.O.A. runs along the western coast of the Northern Caspian (the length of this line is about 225 km). The southern border is in the middle position of isohaline 11.6‰ that goes 15–30 km to the north of the southern border of the Northern Caspian (approximately along isobath of 10–12 m). The width of the offshore area along the delta marine edge is 175 km, while along its southern border, it is about 215 km. V.M.O.A. includes a vast shallow zone (S.Z.) with an area approximately 10,000 km² adjoining the delta marine edge. Its length from the delta marine edge to the depth drop at S.Z. is 35–50 km, and its depth is 1.5–2.5 m (at the sea water level –27 m). It represents a wide platform slightly inclined seaward. This is the submerged part of the delta formed at the low water level. The flat topography of this part of the offshore area is complicated by numerous shallows and islands, natural furrows and artificial shipping canals and fishways, and ground dumps along the canals. The total number of canals crossing S.Z. is 28, out of which 3 are navigable and 8 are main and 17 are auxiliary (feeding) fishways. The navigable are the Volga-Caspian Canal with the offshore length 86 km and an average depth of 5 m; the Belinsky Canal (length – 42 km, average depth – about 4 m), and the Lagansky Canal (length – 30 km, not linked with the delta). Among the main canals there are Gandurinsky (54 km long), Kirovsky (34 km), Bardyninsky (35 km), Obzhorovsky (60 km), Igolkinsky (65 km), and Ganyushinsky (50 km). In the early 1990s, the depth of these canals was 2–4 m. On the seaside S.Z. is limited by a sea bar rising above the water and composed of fine sand and crushed shells. To the south of S.Z. is a deep zone (D.Z.) of the offshore area. The border between these two zones is about 180 km long. The water area of D.Z. is 27,600 km². D.Z. of the offshore area comprises a platform slightly inclined seaward to 70 km wide and 3–7 m deep and with growing depths to 7–13 m (at a sea water level of –27 m).

Volga Naval Flotilla – a naval force of the former Soviet Navy from June, 1918 – July, 1919 and October, 1941 – June, 1944. During the Civil War, it participated in military battles with the White Guards on the Volga and the Kama (then became part of the Volga-Caspian Naval Flotilla). During the World War II, participated in the Battle of Stalingrad.

Volga River Delta – a constituent part of the Volga mouth segment. Occupies an area of 11,000 km² (mouth offshore – 38,000 km²). The VRD summit is the point where the large deltaic arm Buzan branches off the Volga R., 50 km upstream of Astrakhan City. The length of VRD down the shortest waterway from its summit to the mouths of Igolkinsky, Belinsky, and Gandurinsky banks equals 120, 135, and 150 km, respectively (i.e. it increases from the east to the west). The marine edge of the delta is assumed to be the boundary between the delta territory that is not flooded and the mouth offshore. The marine edge of the delta is around 175 km.

The VRD eastern boundary passes along the left bank of the Buzan Arm and on downstream along the floodplain Akhtuba Arm and the water courses Kigach and Sharonova, exiting to the delta marine edge. The western boundary (without the western substeppe ilmens (lakes), which total 2,400 km² in area) runs along the right bank of the Bakhtemir Arm as far as the mouth offshore.

The present-day VRD is a plain slightly inclined toward the sea, with elevations of around -20 m at the delta summit and around -26.5 m near its marine edge. The VRD relief is in large measure determined by the structure of its hydrographic network represented by a very complex system of water courses branching off the 5 major water courses of the delta: Buzan, Boldy, Kamyzyak, Old Volga, Bakhtemir. During the 1950–1960s, Gandurinsky, Kirovsky, Karaisky, Igolkinsky and other canals were excavated. These run offshore to 2-m depths of the North Caspian.

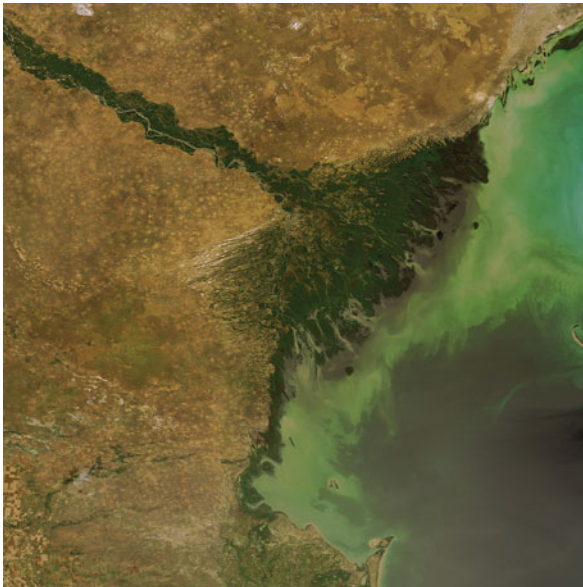
Topography-wise, VRD may be divided into 3 zones in the direction from its summit to the marine edge. The upper zone (around 60 km) with the lower boundary just a little south of the line Astrakhan – Krasny Yar – is the most ancient one, with average elevations upper than -23.5 m. Here, the structure of the channel network is relatively simple. The middle zone (around 40–60 km) extends to the south of the upper zone approximately as far as the line Olya – Karalat – Zelenga – Bolshoi Mogoi – Kotyaevka, confined to the former jutting near the delta marine edge that was formed during the high Caspian Sea water level in the eighteenth century (around -24 . . . -25 m). There are well-developed large watercourses here interconnected with one another by a limited number of disappearing lateral channels. The lower and maritime zone (20–40 km) stretches from the middle zone to the south as far as the delta sea edge. This zone took shape, for the most part, during the nineteenth to early in the twentieth century, when the level of the Caspian Sea was relatively stable. It is characterized by a heavy fragmentation of the channel network, alternation of segments of water courses bifurcation, and merging, active redistribution of runoff among them. Adjoined to this zone is the delta marine edge. This is followed, as far as the denting in the relict marine edge of the delta (existing marine mouth bar) by the semi-flooded and submerged parts of the Volga alluvial fan. In the present conditions, this zone plays the role of a flat mouth offshore.

Distinguished in the VRD relief are “ridges” and “hollows” that separate them. The major Buzan, Bolshaya Bolda, and Bakhtemir arms flow along the most elevated parts of the delta, called “ridges.” The delta abounds in small depressions, filled by lakes, ilmens, and oxbow lakes. Elevated elements of the delta relief include 2–3 m high natural levees along the water courses in the upper part of the delta and 0.3–0.4 m high in the lower part, alluvial grivas (formerly, mouth spits) up to 2 m in height, marine grivas (formerly, marine islands), and Baer’s hills.

VRD is characterized by the world’s most complicated hydrographic network. The delta water courses are large main arms, bypasses that are something intermediate between arms and shallow channels, and small channels and shoalbanks that most frequently occur in the delta upper and middle parts. In the mouth offshore, some water courses of the delta continue in the form of natural rills of artificially deepened navigation or fish-pass canals.

As far as deltaic water bodies are concerned, they distinguish between lagoon *ilmens*, whose maximum depth is 1–2 m, located in between Baer’s hills in the eastern and western parts of the delta and *kultuk ilmens*, generally with the maximum depth of 0.5–1.5 m, formed in the delta marine edge area from small bays (*kultuks*).

The VRD channel network is extremely dense. The number of water courses varies, depending on the Caspian Sea level: increases as the sea level rises, and declines when the sea level drops. At the beginning of the 2nd millennium, the Volga has flowed into the Caspian Sea with 70 arms, as had been indicated in the “Ancient Russian Chronicles.” In the 1930s, there were around 500 water courses at the delta marine edge, and after the sea level decreased, the figure went down to 230; in 1960, the number of water courses again rose to 800 (at the same time, the combined length of all water courses in the Volga delta was 20 times the length of the river itself), by the year 1980, the number of water courses in the delta increased to 1,000.



Volga river delta (<http://www.eosnap.com/public/media/2009/06/russia/20090621-russia4-full.jpg>)

Volga-Caspian Canal, Main Bank – one of the world’s major sea canals, it is the main waterway linking Astrakhan Port with the open sea. Was built to eliminate the need for double transshipment as the ships travel from the sea to the Volga and back. The marine segment of the canal is dug almost through the entire shallow-water northern part of the Caspian Sea from the point slightly to the north of the Volga-Kaspiyskiy Light-vessel to the mouth of Bakhtemir Arm or Rakusha and downstream of the Bakhtemir Arm to a distance of about 185 km up to the

point where it flows into the sea. Further to the north as far as the settlement of Krasnye Barrikady (“Red Barricades”), where the Volga-Caspian Canal ends, the ships navigate down the channel of the Bakhtemir Arm, the river segment of the canal.

The canal construction commenced in 1874 (on the left bank of Bakhtemir stands a humble signpost reading “110 years of the Volga-Caspian Canal, 1874–1984”). The total length of the VCC from the beginning of the canal marine segment to the settlement of Krasnye Barrikady equals 101 naut. miles (188 km). Length-wise, the canal is Europe’s longest. Canal kilometers are counted from Krasnye Barrikady Settlement seaward. The channel part of the canal is 0–86 km, while the marine segment is 86–188 km. All along its length from Astrakhan, the navigation pass runs along the natural water courses of the Volga River, Bakhtemir, the Main Bank; the marine segment runs along the man-made canal. The canal starting point is assumed to be the 0 km at Bertyul Settlement. The marine segment of the VCC comprises 4 stages. Minimum width of the canal at the navigation depth level is assumed equal to 100 m. Canal overall dimensions are so designed as to permit two-way traffic of ships having maximum length of 125 m, width of 16.6 m, and draft of 4.2 m.

The river segment of the canal runs along the Bakhtemir Arm and has several bends. This arm is one of the longest and deepest of the Volga delta. It is meandering and is nearly 100 km long, from Krasnye Barrikady Settlement to the river mouth. The ships navigate at 5 m deep (1998).

Due to siltation of the Volga, the VCC depths are variable. Banks and rifts often emerge in the canal, making navigation difficult. For this reason, dredging operations are permanently carried out in the marine and river segments of the canal (each year, repair work involves over 1.5 million cubic meter of dredged material). Beyond the edge of ditch canal depths are quite shallow.

Not only does the canal function as a transport route, but it is also a unique man-made migration “path” for fish. The most valuable species of fish: great sturgeon, sturgeon, starred sturgeon, Caspian herring, conny, roach and many others come up the canal from the sea into fresh river water for spawning.

Volga-Don Shipping Canal (formerly, V.I. Lenin Canal) – lock navigation canal whose construction commenced before the World War II and was completed in 1952. Links the basins of the Volga River and the Don River at the point of close proximity to each other – in the area of Volgograd-Kalach (101 km long). VDSC originates on the Volga, in the vicinity of Krasnoarmeisk, where ships are elevated to the divide between the Volga and the Don passing 9 locks (total height equals 88 m). On the Don slope of the canal, several storage reservoirs are built that receive the water pumped up from the Don by 3 pumping stations; these storage reservoirs are used to supply water to the water-divide segment of the canal and the locks. The ships descend the divide as they pass through 4 locks (total height of 44 m); having passed lock No 13, the ships exit into a large storage reservoir equipped with retaining works of the Tsymlyansk Hydrotechnic Structure. The reservoir in places is as wide as 20 km, with a maximum wave height of 3 m. Having passed two more locks

of the Tsymlyansk Hydrotechnic Structure, the ships descend to the Don River and proceed on to the river mouth.

Volga-Ural Sands – sandy area of the Circum-Caspian Lowland between the Volga River and the Ural River. Its north-to-south and west-to-east length reaches 250–270 km. Absolute height from the north to the south varies from +2 to –20 m. A semi-desert natural zone with characteristic brown desert-steppe soils. The climate is continental, with an average annual temperature of +7–8°C (July +24–26°C; January –8–10°C). Annual precipitation is 100–200 mm. Total area of VUS is 42 thou km². The VUS area includes Naryn Sands, Circum-Kamysh-Samara Sands, Maritime Sands, and Ryn-Sands.

Volga Water Divide – see *Astrakhan Volga Water Divide*

Volynsky Artemii Petrovich (1689–1740) – statesman and diplomat of the eighteenth century. He is known to descend from a very ancient ancestry that came from Volyn' in the fourteenth century. Other sources say that he was born in Moscow or in Penza Province. In 1704, when he was a 15-year old youth, he was enrolled in the Dragoons Regiment. In 1711, being a courier of Peter I, he delivered instructions for talks with the Turks to the Vice-Chancellor Shafirov and who helped Volynsky obtain promotion. V. was taken prisoner and spent some time in Turkish captivity. In June of 1713, V. was sent by Shafirov with the signed Andrianopol Peace Treaty. Having joined the retinue of Peter I, V. quickly advanced and in 1715 was promoted to the rank of Lieutenant-Colonel. In 1716, Peter I sent an Embassy to Persia headed by the 27-year-old Lieutenant-Colonel V. The official purpose of his trip was to conclude a trade agreement; however, a secret instruction (order) requested V. to study thoroughly, the military, economic, and political situation in Persia, with emphasis on the possibility of making use of the trade route to India via Persia with a view to obtain transit of oriental goods via Russia to the West. V. managed to restore friendly relations between Russia and Persia, set up [for the first time in the history of Russian-Persian relations, under the Trade agreement with Persia (dated July 30, 1717) concluded by him], the Russian consular service in Persia, which explored venues and possibilities of trade with India via Persia. V.'s activity in Persia in 1716–1718 as Russia's diplomatic envoy was appreciated by Peter I highly (albeit not immediately): the Emperor promoted V. to the rank of Colonel and made him his personal Adjutant General. For the same services, in 1719, V. was appointed the Governor of Astrakhan (1719–1725). He was commissioned to discharge the following tasks: organizing and making provisions for the Persian military campaign; bringing the steppe and mountain peoples to the acceptance of allegiance or at least to entering into a union with Russia; establishing administrative arrangements in the province; setting up industry, development of horticulture, and provision of urban amenities in Astrakhan. After Peter I passed away in 1725, V. was transferred to Kazan as its Governor. In 1729, V. was back in Petersburg, where he is moved to the background in the then configuration of political forces; however, in 1737, V. participated in the Nemiroff Congress, where peace talks with Turkey were held. V. continued civil service to attain the rank of a Cabinet Minister after the Empress

Anna Ivanovna came to power. During the gloomy years of Bironovshchina (Biron's repressive regime, E.J. Biron – a favorite of Anna Ivanovna), V. was charged with treason and was executed on April 27, 1740.

In the history of diplomacy, the name of V. is usually associated with talks between Russia and Turkey aimed at eliminating the consequences of the unfortunate 1711 Prut Campaign and with the 1722–1723 campaign of Peter I in Northern Persia.

Volynsky A.P.

(<http://www.cathedral.ru/Pictures/big88194148859552.jpg>)



Vorontsov-Dashkov Illarion Ivanovich (1837–1916) – Count, statesman, major land-owner, Cavalry General (1890), Adjutant General (1875), Emperor Alexander III's personal friend. Participated in the Caucasian war of 1861–1864, in seizing the Ura-Tyube and Jizak fortresses (1865) in Turkestan, and in the Russian-Turkish war of 1877–1878. In 1881–1897, VD was Minister for Imperial Court and Appanages. Chancellor of the Russian Empire Capitul and Tzar Orders. In 1881, he published "Letters on the Current State of Russia" in Leipzig in which he proposed to revise buyout operations, taking into account the peasants' interests, to transfer to the buyout system, stressed economic inexpedience of the peasant commune. After the assassination of Alexander II (1881), he became one of the founders of the "Sacred Brigade" and its actual leader. Carried out a reform of the activity of the Apanage Department (including an attempt to set up farms on apanaged lands ("udel") by

leasing land holdings). In 1904–1905, he was chairman of the Russian Red Cross Society, and from 1905 he was Governor-General in the Caucasus, Commander-in-Chief of the Caucasian Military District, Court, and Apanages. Troops-ordered Ataman of the Caucasus Cossack Force. The initiator of the Bill on reallocation of land plots for private ownership to state-owned peasants (1909), VD planned broad reforms in the Caucasus (promotion of industrial entrepreneurship and railway construction, introduction of local governments, establishment of institutions of higher education, etc.). Early in the twentieth century, assisted by the petroleum corporation “Branobel,” he organized the recovery of oil in Balakhany Settlement (in the vicinity of Baku). VD chaired the boards of directors of a number of charter sugar-mill partnerships. After WWI broke out, VD was appointed Commander-in-Chief of the Caucasus Army; however, he did not participate in military operations.

Voropaev Grigory Vasilievich (1932–1999) – leading Soviet scientist in the field of surface water hydrology and water management problems, science organizer. Doctor of Engineering Science, Corresponding Member of the USSR Academy of Sciences (1976). He graduated from the Moscow Institute of Water Management Engineers. From 1954 to 1971, carried out a large volume of work as a researcher and lecturer in Tajikistan and Kazakhstan, studied the problems of water resources, their use and land reclamation. From 1971, he was at the Institute of Water Problems of USSR Academy of Sciences. From 1976 to 1988 he was the Director of the Institute of Water Problems of USSR Academy of Sciences; Editor-in-Chief of the “Water Resources” Journal; head of the editorial board of the academic series “Caspian Sea”; permanent member of State Expert Committee of USSR Gosplan (1975–1994); Chairman of the Expert Board of USSR Gosplan (1983–1987); Director of the Scientific-Coordinating Center “The Caspian” (1989–1998); Chairman of the Scientific Councils of GKNT and USSR Academy of Sciences for integrated development of the Caspian Sea (1976–1998) and for “Scientific Fundamentals of Management of Land Water Regime and Resources”; Co-chairman of the Joint Russian-Iranian Working Group on the Caspian Sea within the framework of scientific-and-technical cooperation between the Islamic Republic of Iran and the Russian Federation; and Vice-President of the International Commission on Hydrology. Scientific research of V. dealt with the study of surface water resources formation and development of the system to manage their regime as a crucial component of biosphere and an irreplaceable component of productive forces. V. investigated the water balance of irrigated areas and of irrigation systems as a whole and of irrigation reserves. He developed the physiographic principles of water economy balances and was a research supervisor in developing the problem of territorial redistribution of water resources in the USSR. The scientific-research fleet on the Caspian Sea was built under his direction.

V.’s main works: “Irrigation in Some Countries of the World” (in ass. with B.S. Niyazov, 1970.); “Physiographic Principles of a Water-Economy Balance” (in ass. with V.B. Mestechkin, 1981); “Modeling the Water Management Systems of the

USSR Arid Zone” (in ass. with K.Kh. Ismailyov, V.M. Fedorov, 1984); “Economic-and-Geographical Aspects of Shaping up Territorial Units in the Country’s Water Economy” (in ass. with B.G. Blagoverov, G.Kh. Ismailyov, 1986); “Development of Water-Management Systems” (in ass. with G.Kh. Ismailyov, V.M. Fedorov , 1988). Posthumously, the book “Problems of Aral-Caspian Area Water Resources Management” (in ass. with G.Kh. Ismailyov and V.M. Fedorov, 2003) was published.

Voskoboinikov Nikolai Ivanovich (1803–unknown) – born into a doctor’s family. He left Mining Cadet Corps in Petersburg a gold medalist and was sent to Georgian Mining Academy, where he studied mineral deposits. In 1825, V. was sent to the Baku oil fields. In 1834, he was appointed director of Baku and Shirvan oil fields. He proposed to make arrangements for petroleum processing in Baku (most of the oil recovered at that time was exported to Persia). In 1837, V. designed an oil-refining apparatus. That same year, he completed the construction of an oil refinery at Balakhany Settlement. Here, the process of oil refinery with water vapor was accomplished. For the first time ever, natural gas was used for oil heating. In 1846, V. resigned in the rank of a Colonel for health reasons. His subsequent destiny and the date of his death are unknown.

Voyeikov Alexander Ivanovich (1842–1916) – outstanding Russian climatologist and geographer. Corresponding Member of the Petersburg Academy of Sciences (from 1910). Ph.D. degree awarded by Goettingen University (1865). Doctor of Physical Geography degree awarded by Moscow University (1880). At the initiative of V., Meteorological Commission was set up at the Russian Geographic Society. Founded the first Russian meteorological journal “Meteorological Bulletin” (1891). From 1872 to 1876, traveled in Western Europe, North, Central and South America, India, Central Asia, China, Ceylon, Java, and Japan. Published a monograph, “Climates of the Globe, Especially of Russia” (1884), for which he was awarded the Grand Gold Medal of the RGS. V. may be regarded the founder of the study of the Caspian Sea water balance: as early as in 1884 he made an estimate of evaporation from the sea water area (approx. 1,085 mm/annum) and the amount of precipitation falling on the sea surface (around 200 mm/annum); the estimates were surprisingly accurate. V., having studied the causes underlying the fluctuations of the Caspian Sea level, made a firm conclusion that “the level of the Caspian Sea primarily depends on the value of water influx from the Volga”. Later, V. enlarged on a thesis about the relationship between sea level fluctuations and climatic causes.

For the first time in geographical science, V. applied the balance method to the study of geographic phenomena (water balance in glaciers, of humidity in the air, etc.); laid the foundations of paleoclimatology, agricultural meteorology, phenology; and offered a classification of the world rivers based on their hydrological regime.

V. was a member of numerous scientific societies in Russia and abroad. The Main Geophysical Observatory in St. Petersburg has been named after V. “Selected Works” in 4 volumes were published from 1948 to 1957.



Voyeikov A.I. (<http://www.museum.msu.ru/exp/48/8646voienkov.jpg>)

Vuzovskoe Lake-Storage Reservoir – man-made lake-storage reservoir produced as a result of building the October Revolution Canal (ORC). Located at the boundary between the Coastal Lowland and the Terek-Sulak Lowland in Makhachkala City at the foot of Anjiarka Mountain in Daghestan. Used for water supply. Its length is 1,200 m, its width is 200 m, and its depth is 15–20 m.

Vyalenie (air-sunlight drying) – a technique for preserving fish. The substance of the V. process consists in slow drying of the fish under the impact of heat, sunlight and air, which results in considerable transformations in the composition of fish flesh and more uniform distribution of fat in the fish carcass. The fish meat becomes of amber coloring and acquires a specific taste and aroma. The best sun-dried roach is seasoned on dry, still days of early spring prior to the spawning period, when the roach has lost no weight or fat; besides, during this period of the year, judging by

the atmospheric and temperature conditions, V. yields the best results. Depending on the size of the fish, roach is sun-dried for 13–30 days.

V. is also used for seasoning hung balyk items made of red fish (great sturgeon, sturgeon, and starred sturgeon), of salmon, inconnu, as well as of sheat-fish, large herrings and other fish. The only difference is that balyks are sun-dried not on upright hangers, but on 10 m-high roofed towers, and instead of the walls, there are sun louvers: the hung-up pieces of fish are blown with wind, but are not heated with direct sun rays. The hung sun-dried balyks apparently received their existing name because in the course of drying they hang on the towers for a long time. Balyks are made of the fish back, sides, and belly.

Vyaziga – dried spinal cord – dried cord (chorda) of red fish, good to eat. Pies with V. are quite popular.

W

Water Area (in Latin *aqua* – “water”) – the area of water surface within the set borders of a sea or port. W.A. ensures safe maneuvering and moorage of ships through a port waterway.

Water Balance of the Caspian Sea – the WB, or, to be more exact, the water budget of lake-type water bodies is understood as the ratio between the water assimilated into a water body and that lost from the body. The members of a WB equation represent units of volume (e.g. km³/annum); these reflect variations of water volume in the water body over a certain time interval. On the other hand, if the members of a WB equation are assigned in values of water layer thickness (cm, mm), then the equation represents variation of the water level in a water body. When the sum total of the water assimilated components in the aforesaid equation is greater than the sum total of water loss components, the water volume in a water body increases and the water level rises. However, when the water assimilated components part of the equation is smaller than the water loss components part, this means that the water volume in a water body decreases and the water level in it goes down. The difference between the two parts of the WB is called the balance resultant.

In the Caspian Sea, the input part of the WB includes surface runoff, atmospheric precipitation, and groundwater inflow, whereas output is evaporation from the water surface and sea-water runoff into Kara-Bogaz-Gol Bay (where it evaporates). Of crucial importance to the WB of the Caspian Sea are river runoff and evaporation, the ratio between which ultimately largely determines the year-to-year variations of the water volume and water body level. The WB of the Caspian Sea was repeatedly calculated over different periods of time by many authors, yet there are substantial differences in the results obtained. This is due to the nature of used materials and the calculation procedures. The greatest difficulty is determination of the values of evaporation and groundwater inflow, since there are no direct measurements of these WB components. For this reason, all WB estimates should be accepted with certain assumptions.

River runoff is the main input component of the WB, contributing up to 80% of the total water inflow into the sea. At the same time, river runoff is extremely variable. During the last century, given its average of around 300 km³/annum, the

runoff varied from 335 km³/annum in 1900–1929 to 240 km³/annum in 1970–1977. The Volga contributes around 80% of the river runoff, its average long-term runoff equaling around 2,40 km³/annum. Maximum recorded runoff of the river is 350 km³/annum (1926); minimum is 150 km³/annum (1973 and 1975). Up to 25% of the Volga runoff flows into the sea at the time of the May–June flood. Around 15% of the runoff going into the Caspian Sea is contributed collectively by the Ural, Terek, Sulak, Samur, and Kura rivers, while the runoff of small rivers, including the Iranian coast, accounts for around 5%.

As far as the dynamics of river runoff to the Caspian Sea is concerned, it is necessary to take into consideration the use of the runoff for various economic purposes, which makes estimates of the runoff quite a problem. According to the available data, the value of man-induced withdrawals of the surface runoff to the Caspian Sea (1986–1990) equals around 40 km³/annum, out which 25 km³/annum falls on the Volga. Without these losses of the runoff, the level of the Caspian Sea during 1955–1990 would have been 1.6 m higher compared with actual observations.

The volume of atmospheric precipitation compared with river runoff and evaporation is substantially smaller, which is why its impact on fluctuations of the Caspian Sea level is so insignificant. The relative contribution of atmospheric precipitation to the WB input varied from 18% at the beginning of last century to 25% during 1970–1990, when around 85 km³/annum of precipitation fell on the sea surface on average. This is substantially higher than the long-term rate over the period of 1900–1990 equal to 76.6 km³/annum, or a 20 cm-thick layer. From the beginning of last century it has been possible to trace the general upward trend of atmospheric precipitation falling onto the surface of the Caspian Sea.

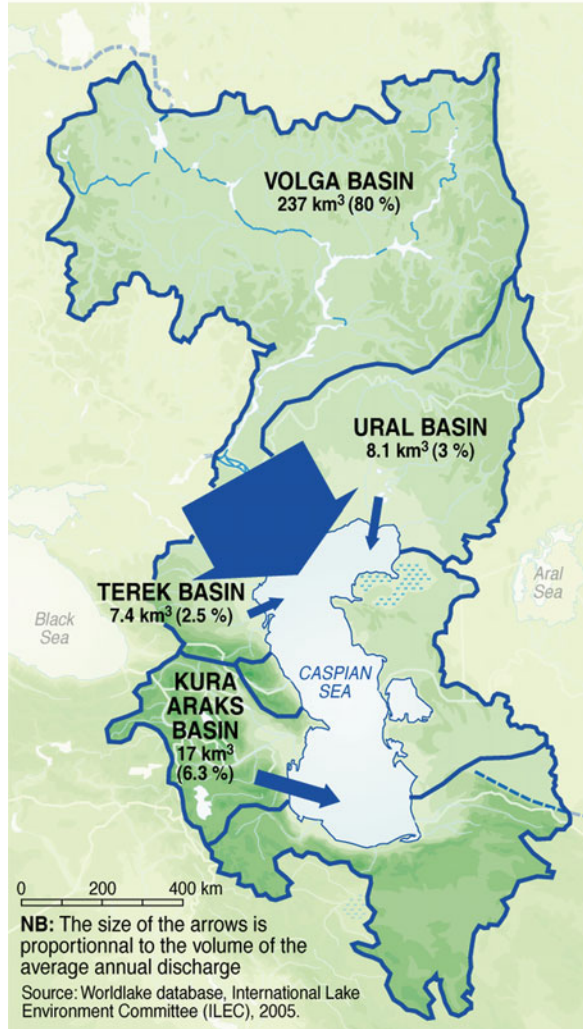
The role of groundwater flow in the Caspian WB is insignificant. Conventional estimates indicate that its average value round the sea perimeter equals 4 km³/annum.

Evaporation from the sea surface is the primary WB output component. Compared with the river runoff, year-to-year variability of the evaporation value is substantially lower. The evaporation processes over the Caspian Sea were most intensive in the 1930s and in the first half of the 1970s. During the early decades of last century, evaporation from the sea surface used to be as high as 390 km³/annum (97 cm of water), during the 1930s – 395 km³/annum (100 cm of water layer), and from 1970 to 1977 – 375 km³/annum (104 cm of water layer). At the end of last century, evaporation declined considerably, and from 1978 to 1996 it equaled 353 km³/annum (93 cm). Thus, during different periods of the twentieth century, the evaporation value varied approximately by 40 km³/annum, while the average loss of water by the sea amounted to 376 km³/annum (97 cm of water layer). In the course of the year, evaporation is the highest from June to December, around 70% of the annual volume. As far as the sea water area is concerned, the evaporation processes are most intense in the North Caspian Sea, where over 100 cm of the water layer on the average is evaporated.

Caspian WB output components also include sea-water runoff into Kara-Bogaz-Gol Bay. The runoff value is subject to the difference between the sea and bay levels and to the morphometry of the strait that links the Caspian Sea with

Kara-Bogaz-Gol. Given the same section of the strait, the greater the difference between the levels, the larger the volume of Caspian water flowing into the bay. Prior to the commencement of the decrease of the sea level in the 1930s, the water input into the bay amounted to 20–25 km³ each year, while the drop between the sea and bay levels was 0.5 m. The long-lasting decrease of the Caspian Sea level resulted in reduced runoff into the bay, and toward the end of the 1970s the annual input of sea water into it was never more than 5–10 km³. In order to reduce the deficit of the Caspian Sea water balance, an earth dam was built in 1980. However, the level of

Annual discharge into the Caspian Sea



Water balance of the Caspian Sea. Annual flow of water to the Caspian Sea. (2007). In *UNEP/GRID-Arendal Maps and Graphics Library*. Retrieved 21:14, May 22, 2009 from <http://maps.grida.no/go/graphic/annual-flow-of-water-to-the-caspian-sea>

the Caspian Sea began to rise, therefore a special water-outlet structure was added to the dam in 1984, and in 1992 unhindered flow of Caspian water into the bay was resumed. At present, the annual volume of runoff equals 17–18 km³/annum.

Analysis of the Caspian Sea WB from 1900 to 1996 indicates that it was negative until the end of the 1970s due to the river runoff. The WB deficit conditioned the overall protracted trend toward sea level decrease. It was only in 1978 that the hydrological regime of the Caspian Sea was reversed and since then its WB has been characterized by a positive value. In 1978–1996, due to river runoff and atmospheric precipitation, the sea received 40–50 km³/annum more water than the amount spent for evaporation and runoff into Kara-Bogaz-Gol. This ensured a greater volume of water in the sea and rapid rise of the sea level.

Water Impounding (Invasion) – (1) combination of hydrotechnical activities aimed at supplying water to dry and low-water areas for domestic and economic needs; (2) emergence of water and increased percentage of its content in crude oil or oil products during transportation. W.I. is more often than not the result of oil products loading in tankers or in tanks onto residual oil products with a high percentage of water content; flaws in the ship's hull or tank body; condensation of the hull walls due to temperature variations during the day. Oil products subjected to water invasion must, prior to use, be dehydrated.

Water Problems Institute (WPI) of Russian Academy of Sciences – Until 1992 in the system of the USSR Academy of Sciences, then later in the RAS. Established in 1968 as part of the Division for Oceanology, Physics of the Atmospheric, and Geography of the USSR Academy of Sciences. Principal research areas: development of a theory of water resources formation and of land waters hydrological regime and quality; investigating the problems of interaction between land water resources and the environment; theoretical and experimental research into natural processes in the aquatic environment and the impact of these on the ecosystems and health of the population and substantiation of measures towards improvement of the ecology of water bodies; protection and integrated use of land water resources; and enhancement of reliable water supply for Moscow, the Moscow Region, and other major regions of Russia.

Water Resources – surface and groundwater reserves of an area under consideration.

“Water Resources” – scientific and theoretical journal of the Water Problems Institute of the Russian Academy of Sciences. Established in 1972. Deals with problems of natural waters quality, the state of ecosystems, integrated use of land waters, and their interaction with the environment. Publishes articles on subjects relating to the Caspian Sea. Published 6 times a year.

Water Transportation – one of the most ancient, essential, and most economical modes of transport using natural (oceans, seas, straits, lakes and rivers) and man-made (canals, locked rivers, storage reservoirs) ways for the navigation of

various vessels of varying types and sizes, carrying passengers and cargo. They are distinguished between two major types of WT – sea and river.

“Wave and Wind Atlas of the Middle and Southern Caspian” – published in 1961 and containing maps of wind and wave field distributions in space and time in the Caspian Sea.

Wave Regime of the Caspian Sea – characteristics of waves on the sea surface, produced mainly by winds. Wave parameters are determined by wind velocity (m/s), wind duration, and extent of the water surface impacted by the wind (length of wave fetch). Waves that remain after wind cessation are called swells. The Caspian Sea is rather choppy. The winds blowing over the seas (see Wind Regime of the Caspian Sea) are capable of causing heavy seas, which are dangerous to practical activity at sea. The size of waves developing on the Caspian Sea is comparable with oceanic waves.

According to the wind fields prevalent over the Caspian Sea, blowing along the sea longitudinal axis, the waves in its open areas more often spread from the north and northwest (32%) or from the south–east and south (36%). More seldom (around 12%), easterly waves are observed. In roughly 20% of the cases, when there is light air and calm, the waves are weak and unsteady. In open areas of the sea it is not uncommon to see large swells, predominantly from the north and north–west.

In all typical situations, as the wind velocity increases, the recurrence of the appropriate wind field declines, and therefore waves most frequently observed correspond to the wind velocity of up to 10 m/s, and hardly ever of wind velocities over 25 m/s. With winds of up to 15 m/s in summer, there northerly waves are prevalent, and in winter southerly waves dominate. In this case, the height of waves of 5% probability does not exceed 3 m. Storm-induced waves are more common in winter and spring, when the velocity of northerly winds equals 20–25 m/s. Strong, protracted storms are more typical for open water areas of the Middle Caspian Sea, where the most hazardous wave directions are northwesterly and southeasterly. The character of wave fields is impacted by the orographic effect: there occurs a shift of storm activity towards the western shore of the Middle Caspian Sea. Along the eastern seashore, waves are generally twice as weak as they are along the western seashore.

When the sea is hit by northerly storms, maximum waves are observed around the Apsheron Archipelago, where the number of stormy days averages 40–50 during a year, most of which are in winter. The epicenter of maximum waves is northwest of the Neftyanje Kamni shoalbank, where the height of waves may be as high as 8 m, and in extreme storms even 9–10 m. More often than not 2 m high waves are observed around the Apsheron Peninsula. Near the Turkmen shore, moderate and strong northwesterly winds of 5–15 m/s produce waves of up to 1 m high, while storm winds cause waves as high as 2–3 m.

With south-easterly winds across the entire water area of the South Caspian Sea, the waves are weak – under 1 m. Maximum waves with these winds develop in the north of the Middle Caspian Sea, in the Makhachkala-Derbent areas and near the

Mangyshlak Peninsula (Fort Shevchenko-Kenderli), where a height of 5% probability waves may reach 6–7 m. The same height of waves under southeasterly storms is observed in the sea open water area. Easterly winds even with maximum velocities cause waves whose heights do not exceed 2–3 m.

In the North Caspian Sea, the development of wind-induced waves is limited by the depth of the sea. At a wind of 15–20 m/s, the waves in shallow waters reach maximum values and when the wind velocity keeps increasing, they stop varying. The most frequent directions of waves in the North Caspian are northwesterly, easterly and southeasterly (around 70%). The maximum possible wave height increases from the north to the south, as the depth increases. At a wind of 15–20 m/s, the height of 5% probability waves increases from 0.5 m near the Volga delta to 4.5–5 m at the increased depths at the boundary with the Middle Caspian. The calmest time on the North Caspian is summer, when calm is established over a large water area.

Well Boat – a fishing vessel having a special compartment in its middle part separated by two watertight partitions. In the bottom and on the sides of the compartment are made special slots through which water from the sea gets inside. This compartment serves as a floating well for transportation of the caught fish to a fish plant.

Wetlands – pursuant to the Convention on Wetlands that is of international importance, mainly as habitat of water fowl, the W. are understood to mean the areas under bogs, peat lands, or water bodies – natural or man-made, permanent or temporary, stagnant or circulating – water reservoirs, fresh-water, brackish-water, or saline-water bodies including the sea water areas, whose depth at ebb is a maximum of 6 m.

Wilayat (Velayat) – unit of administrative-state division in some countries of Central Asia, including Turkmenistan.

Wind Effectuated Fluctuations of the Caspian Sea Level – in the enclosed Caspian Sea, the impact of atmospheric pressure and wind on the water surface produces non-periodic fluctuations of the water level, with both wind-induced and negative surges. Their value (height) is usually determined as a deviation of the water level at a particular point from the mean – monthly value. These short-lived abrupt fluctuations account for high values of the sea's levels. The data on positive and negative surges (height, duration, velocity of water level change) are determined by the peculiarities of the wind fields as well as by the local physico-geographical conditions: sea depth, seabed topography, presence of aquatic plants, and ice cover. The positive and negative surges are best manifest in the coastal areas of the sea, in bays and bights.

The most significant positive and negative surges on the Caspian Sea are caused by regional winds blowing along the great axis of the sea northwesterly and southeasterly. In some areas, positive surges are also produced by local winds. The maximum velocity of sea level rise is observed in case of rapid

development of windstorms. At sea (near the islands) and on the open coast, the sea level rises slower than in bights. Also noted is that the lowering of the sea level caused by negative surges is more abrupt than in case of positive surges.

Typical of the shallow-water North Caspian are the highest positive surges, reaching 3–4 m. In the middle and southern parts of the sea, non-periodic sea level fluctuations are lower, yet these are significant, too. Long-term observations indicate that the maximum value of positive surge here equals 50–70 cm, while negative surges are from 30–100 cm. The maximum range of sea level fluctuations varies in a range of 100–150 cm. Minimum storm-induced positive surges are observed in the border area between the middle and southern parts of the sea (Neftyanye Kamni, Kuuli–Mayak). The recurrence of positive and negative surges in different areas of the sea varies from 1 to 5 times a month and from several hours to one day and longer, while the velocity sea level variation and the rate of sea level change may be quite high.

Small depths and seabed slopes in the coastal zone are conducive to the development of significant storm-induced surges in the North Caspian. Frequent southeasterly and easterly winds in the North Caspian produce a positive surge near the west and northwestern shores and in the Volga mouth offshore, while negative surges occur near the eastern coast. Northwesterly and westerly winds lead to the opposite effect in the short-lived fluctuations of the sea level. In the western part of the North Caspian, maximum positive surges were noted near Caspiiskii Settlement (4.5 m), while in the eastern part they were near Zhilaya Kosa Settlement (2.5 m). Conversely, maximum negative surges were observed near the Volga-Kaspiisky Light-vessel (2.3 m) and near Zuidwestovaya Shalyga Island (1.5 m). In some areas of the eastern part of the North Caspian, negative surges may also be quite considerable. In winter, the ice cover reduces the value of positive and negative surges, especially in the eastern part of the water area.

The spread of positive surges in the Volga delta depends in large measure on the position of the mean sea level (MSL). When MSL is high, close to the current one, positive surges may freely penetrate into the delta, reaching Astrakhan. When MSL was lowering for a long time, however, the zone of maximum positive surges shifted towards the open sea by 40–50 km.

The gently sloping shores of the North Caspian and of the coastal segments of the seabed results in a situation when in cases of strong storm-induced positive surges large areas of land are flooded and during negative surges large shallow-water areas are drained. The flooded zones may be as wide as 30–50 km, while drained areas may be 10–15 km wide. In November, 1952, there occurred a catastrophic positive surge in the northwestern area of the sea, when the water surge near Caspiiskii Settlement reached 4.5 m. In the eastern part of the North Caspian, positive surges in excess of 40 cm are noted 5–20 times a year. At winds under 15 m/s, the water rises by 50–80 cm, while at winds under 25 m/s, they rise by 90–150 cm. The duration of positive surges usually is 1.5–2.5 days. During positive surges, all kinds of pollutants (i.e. oil products, toxic chemicals, etc.) are likely to wash into the sea from the coastal strip.

In the deep-water basin of the sea, northwesterly and westerly winds induce mainly positive surges in the South Caspian, and negative surges occur in the Middle Caspian. Southeasterly winds, on the contrary, assist the lowering of the sea level in the southern part and the rise of the sea level in the middle part of the sea; however, the general picture of wind-effected phenomena is substantially complicated by the induced compensation currents as well as by the local physico-geographic conditions. For example, in Makhachkala area, when a northwesterly wind is blowing, a negative surge is produced and lasts until the wind and currents induce a compensation water inflow. When this happens, with the same wind blowing, the lower of the MSL is terminated and MSL may even rise a little. In case of southeasterly winds, a positive surge is induced throughout the northwestern part of the sea.

Near the north shore of Apsheron Peninsula, strong and lasting northwesterly winds produce a positive surge effect, while the southerly winds produce negative surges. The maximum value of a positive surge is 70 cm and of a negative surge is 60 cm. In Baku Bay, when northerly wind is blowing, MSL at first drops abruptly, but then, as the overall sea level of the Caspian Sea rises with the same wind, the negative surge stops and the sea level gradually rises. Southerly winds in Baku Bay produce positive surges.

In the coastal areas of the South Caspian, from Astara in the west to Turkmenbashi in the east, the value of positive surges at the winds of the northerly quarter equals 50–80 cm. The value of negative surges at southeasterly winds in Turkmenbashi and Alaji areas exceeds 1 m. In the eastern part of the Middle Caspian, maximum negative surges are formed by northwesterly winds that blow mostly in summer, while maximum positive surges are formed with southeasterly winds. The range of sea-level fluctuations around Mangyshlak Peninsula and Bekdash is over 1 m.

The existing close correlation between the fields of atmospheric pressure and wind and storm-induced positive surges provides the basis for diverse procedures of surge forecasting. There are statistical forecasting methods based on actual fields of pressure as well as on hydrodynamic simulations, enabling researchers to calculate the height of maximum surge and the width of the likely flooded area.

Wind-Induced Drying – drying produced in the zone of most frequently recurring negative and positive surges. The study of WID in the North Caspian indicates that such areas are sub-horizontal surfaces structured by fine-sand or silt drifts usually covered with thickets of reed, cat's-tail, or alkali grass meadows. WID surface may exhibit runoff canals of surging water and alluvial fans. In the north-eastern part of the Caspian, the surging phenomena, together with the wave processes shape up semi-submerged accumulative forms – shalygi (sand islands), normally forming long ridges, oriented approximately parallel to the shore. When strong downsurge winds blow along the western, northern and eastern segments of the North Caspian coast, 10–15 km wide wind-induced drying zones may be formed.

Wind Regime of the Caspian Sea – formed under the impact of 3 major factors: regional atmospheric activity, coastal relief (orography), and local circulation induced by the difference of temperature on land and in the sea. Judging by the nature of air mass transfer over the Caspian Sea, stable wind fields of the following main directions are established: northwesterly, northeasterly, southeasterly, and a whirlwind field. During the greater part of the year, most stable winds of northerly and southeasterly directions are prevalent over the sea. The field of northerly winds is generally observed in 40% of the cases during a year; these winds prevail in summer (up to 50%), half of these being northwesterly winds. The recurrence of southeasterly winds is up to 36%, and these are dominant in winter and spring (around 40%). The winds of a whirlwind type are observed in 4–7% of the cases, whereas breezes (slower than 5 m/s) occur in 20% of the cases on average, the percentage increasing during summer. Strong northwesterly and southeasterly winds (velocity over 10 m/s) account for 4–6%. Average recurrence of severe storms (wind velocity over 25 m/s) is very low. Storms of such force encompassing a considerable area of the sea occur only once every couple of years. The average annual wind velocity in the Caspian water area is 5.7 m/s.

The maximum average wind velocities are observed in the middle part of the sea and equal 6–7 m/s, and around Apsheron Peninsula – 8–9 m/s. Throughout the eastern coast, the average annual wind velocity is roughly the same – 5–6 m/s – with a maximum around the Mangyshlak Peninsula. In the South Caspian, where strong winds are not common, the average annual wind velocity is 3–4 m/s, the recurrence of weak winds here being as high as 90%.

In the southern part of the sea, the number of stormy days (when wind velocity is over 15 m/s) does not exceed 20–30 days/annum. In the North Caspian and on the eastern coast of the Middle Caspian there occur 30–40 storms during a year. The Apsheron Peninsula exhibits maximum storm activity: 50–60 days/annum. The orographic effect has a considerable impact on storm activity in the Apsheron area. While skirting the Caucasian Mountains that approach the sea here, the prevalent northwesterly wind flows become distinctly north-oriented and reach a velocity of 20–25 m/s. These are the well-known “Baku nords.” To the south of the Asheron Peninsula, the wind velocity gradually decreases to 2–3 m/s in the southern-most areas of the sea, especially in summer. Also typical of southeasterly storms is the increase of wind velocity in the direction of air mass transfer, with a maximum around Makhachkala and in the northwestern part of the sea.

Easterly winds are dominant over the North Caspian. Their recurrence during a year averages 50% for the western part of the water area and 36% for the eastern part. Fairly frequently noted are also westerly and northwesterly winds – 12%, and the recurrence of calm winds equals 14%. The average wind velocity in the North Caspian is 5.8 m/s, the lowest average velocities (3.5–3.8 m/s) being noted in summer. Strong winds (over 15 m/s) fall mainly on the eastern and southeastern directions, their annual recurrence being 1.0% in the west and 1.5% in the east. In winter, the recurrence of these winds increases to 2%.

Wintering Hole – in the Volga delta, in its maritime section, holes in the bottom of river channels or in their meanders where fish in a state of hibernation or numbness lie for the winter. The fish lie in the water in separate congregations, pressed closely to one another.

World Energy Cities Partnership – brings together major cities associated with oil fields production, operation, and management. The cities include Houston (USA), Baku (Azerbaijan), Calgary (Canada), Perth (Australia), Vung Tau (Vietnam), Aberdeen (Scotland), and Stavanger (Norway).

Wulf – local name of Dash-Zireh, an island, nearly 1 km to the east of Plita (“Plate”) Island south of the Apsheron Peninsula, Azerbaijan. The W. Island is low-lying and in places is covered with scarce vegetation. The shore of the northern part is shallow, while the southern shore is steep. There is a jetty on the southern part of the island.

Y

Yaichny Island – the southernmost of the Chechen Islands, Daghestan. It is located near the northern top of the Agrakhansky Peninsula from which it is separated by the narrow and shallow Lopatinsky Channel. The middle part of Y.I. is elevated, while the peripheral parts are low, and when strong southern winds blow, become inundated. During the periods when the Caspian water level drops, the strait between the Y.I. and Bazar islands dries out and the islands merge.

Yaik (in Tatar – *Djaik*) – the ancient name of the Ural River. This name implied “silver plate with a golden bottom,” stressing in this way the high purity of the water. After suppression of the Peasant’s War under the leadership of Pugachev in which the Yaik Cossacks took part in 1775 following the edict of Empress Catherine II, Yaik was renamed Ural. The name “Yaik” is still used only in people’s songs and among the local Cossacks.

Yaik-Guriev Township – see *Atyrau*

Yaitsky (Yaik) Cossacks – free Cossack communities formed in the late fifteenth to early sixteenth centuries on the Yaik River uniting fugitive peasants. The government enlisted Y.C. to control the southeastern borders. In 1743, Y.C. were granted the right to possess all fishery areas from the Yaitsky Township to Guriev, and in 1748, the Yaitsky Cossack troops became a permanent unit divided into 7 regiments. The troops took part in the Pugachev’s riot and after its suppression the troops were renamed into the Ural Cossack troops.

Yaitsky Township – the ancient name of Uralsk City.

Yalama – a river flowing into the Caspian Sea in Azerbaijan 10 km south of the Samur River.

Yamnoye – villages located in the Ikryaninsky and Volodarsky districts of the Astrakhan Region, near the sturgeon hibernating pits.

Yatov, Yatovi – deep hibernating pits in the river bottom where great sturgeon and other sturgeons on their run upstream a river settle down if they are caught by winter

in this place and where they stay till spring. In such Y., the sturgeons are fished with pike poles.

Yeraliev – maritime balneo-climatic spa location on the eastern shore of the Caspian Sea in Kazakhstan. The climate is arid, and the winters are mild with a sporadic snow cover. The mean temperature in January is -3°C , while the summer is hot with a mean temperature in July of 26°C . Precipitation is 150 mm/annum. Primary natural curative factor at the spa is thermal (69.7°C) waters, nitrous, sulfate-chloride, sodium, and silicic acid, with water mineralization of 8.6 g/l. Reached by drilling to a depth of 1,106 m, the daily yield is 1,234 m³. Rich resort resources of Y., with sand beaches convenient for bathing that produce favorable conditions for medical treatment (digestive organs, the locomotive system, and the nervous system) and rest.

Yeralievo – low-activity port in Kazakhstan, located near the shore of the Alexanderbai Bay. There is a settlement of the same name 2.5 km east of the port. Has transportation links with Atyrau Town and Bektash Settlement in Turkmenistan.

Yerik – deltaic water course, up to 30 m wide in the lower reaches of the Volga and north Circum-Caspian; an oxbow lake, bay, blind bypass, and abandoned channel flooded by spring waters; a deep bypass linking the lakes; a river arm, creek, tributary, ravine; temporarily flooded channel during a high-water period. A complex system of yeriks is noted in the Akhtuba River delta. The southeastern part of Astrakhan features the following yeriks: Middle Kutum, Teplen’kii, Tatarka, Krutoi, Talyi, Batkashnyi, Kulakov, Three Bypasses, Kokakal, and others. These constitute the hydrological network of the Lower Volga.

Young Shore Ice – a strip of ice attached to the shore, observed during the period of water body (river, lake) freezing.

“Yuzhsibreka” – a conventional name of the project proposed in the 1950s by A.A. Shulga, an employee of SOPS of the USSR Academy of Sciences, on construction of a high-capacity waterway going from east to west and involving the Caspian Sea and its basin. This waterway was to take water from the Upper Ob, Middle Irtysh, Chiderta, Saleta, Cheglinka, Ishim, Bugan, Turgai, Irgiz – in other words from all rivers that would be crossed by “Y.” In general, these rivers would give to “Y.” 100 km³ of water a year (i.e. nearly 5 times more than the flow the Kura and Terek rivers bring into the Caspian Sea).

Already at the first stage of construction, “Y.” should become a network of deep waterways suitable for navigation and linking Kuzbass with Ural, Northern Caspian (via Emba) and with the Aral Sea. The second stage included water intake from the Tom’ River (by construction of the training dam near Kemerovo) and transfer of this water via the Sever, Un’ga, and Inyuz rivers into the Novosibirsk Reservoir and further on along the main “Y.” channel to the Pre-Caspian Depression. The Tom’

flow after passing the North-Caspian power plants is directed to the Trans-Ural part of the North-Caspian depression for irrigation, watering, landscaping, and creation of fishery ponds. In this way, the territory of 5 million hectare occupied by deserts and semi-deserts will be improved.

Z

Zabrody – Lower Volga fisherman’s waders.

Zaburunye – shoal, running parallel to the shore, where the waves break at the shore; likely to meander, depending on the wind; in the North Caspian – “spit,” “beach-ridge,” “above-water beach mounds on the shoal,” shoal-ridge along the Caspian shores.

Zagul’ba – maritime climatic health resort, Azerbaijan. Part of the Apsheron group of health resorts. It is situated on the northeastern coast of the Apsheron Peninsula in the Caspian Sea between the Buzovna and Bil’gyakh health resorts. It has a sand beach. Treatment of patients for diseases of the cardio-vascular system, locomotive system, and nervous system are offered here.

Zaikov Boris Dmitrievich (1897–1961) – hydrographer, Doctor of Geography (1944), and Professor. Between 1934 and 1961, worked at the State Hydrological Institute. From 1937 to 1946, studies of the Caspian Sea water balance for the preceding 100 years were carried out under the guidance of Z. Concurrent with this, studies of the Aral Sea water balance, runoff, and surface evaporation were carried out, and a classification of USSR rivers was prepared. Z.’s works includes: “High-Water Floods and Flash Floods on USSR Rivers over a Historic Time” (1954), “Essays on Lake Science” (1955–1960), and “Caspian Sea Water Balance in Connection with the Causes for Its Level Drop” (1946).

Zakhoder Boris Nikolaevich (1898–1960) – one of the pioneers of the Soviet oriental sciences who studied closely the Muslim historic documentation collected in the archives of the USSR. His doctoral thesis (1941) evaluated the activity of the major Seljuk Vizier Nizam al-Mulka. In 1962, Z.’s fundamental work, “Caspian Code of Data on East Europe: The Gorgan and Volga Region,” was published posthumously. An adapted text of extracts from this work was published in L.N. Gumilev’s book “Khazaria Discovered” in 1966.

Zalom (“Folded herring”) – (1) commercial name for some of the larger groups of herrings whose body length exceeds 29 cm that flock into the Volga in spring; (2) popular name of Volga herring derived from the fact that when the fishes were

packed in barrels, some of them would not go in as they were too large, so their tails had to be “folded” to fit the barrel; (3) blackback shads – folded herrings were also referred to as “imbecile” and people feared to eat it because during spawning right near the water surface, the herring would swim in large circling movements and the water looked like it was “boiling.” Blackback shads were only used for straining off. Academician K. Baer recommended that this fish be salted.

Zastruga – sand ripples on the seabed in the northern part of the Caspian; a large submerged shoal (spit).

Zayachii (“Hare’s”) – one of the four Volga River islands in Astrakhan Port water area. The island is along the Volga right bank some 10 km upstream of the commencement of the Bakhtemir Arm and is separated from the bank by a narrow bypass, Serebryanaya Volozhka.

Zhanaozen – town in Mangystau Region, Kazakhstan. Situated on Mangyshlak Plateau, it developed on the basis of the Uzen’ Oil Field in 1961. The population of the town and adjacent settlements is 71,100 people (2009). A town-forming company is “Uzen’munaigaz” – one of the largest oil-and-gas companies. It develops the Uzen and Karamandybas fields.

Zhazgurly-Basgurly, Zhazgurlyin Depression – situated in the south of Mangyshlak Peninsula, 20 km east of Kaundy Depression, Kazakhstan. Z.D. is of an oval shape, stretching 25 km from the west to the east, 12 km wide and 100 m deep. The depression is characterized by steep slopes indented by ravines. Its flatter western slope gradually transforms into a slightly undulating aggraded plain, dividing the depression into two halves: the Zhazgurly and the Basgurly.

Zhdanov Shoal – located at the entrance into Krasnovodsk Bay (Turkmenbashi Bay), it is named to commemorate the “Zhdanov” tanker that discovered the shoal.

Zheleznye Vorota (“Iron Gate”) – Russian name for Derbent. A. Contarini (1474) wrote that Derbent was called Z.V. “because it was impossible to enter Midia or Persia from Tataria other than by way of this city”.

Zherebtsov Ivan Matveevich – Lieutenant of the Russian Fleet. In 1847, Z. was commissioned by the Hydrological Department to make a description and take measurements of the Caspian shores and create a chart of the shores of Kara-Bogaz-Gol Bay. Having described the bay, Z. came to the conclusion that it was of no interest to Russia as a state; however, in order to prevent fish-kill in the perilous waters of the bay, Z. made a design of a dam serving as bay barrier; besides, he felt the dam would help maintain the sea level required by the state. When Z. completed his survey and description of Kara-Bogaz-Gol Bay, he returned to Guriev, where he met with G.S. Karelin; Karelin scanned materials of the expedition and suggested that the salt delivered from the shore of Kara-Bogaz-Gol Bay could be Glauber’s salt that occurred in nature in the form of mirabilite mineral. Karelin criticized sternly Z.’s design that seriously delayed the development of Karabogaz wealth. The place

of Captain Z. burial, who was the first-ever explorer who had charted the shores of Kara-Bogaz-Gol Bay, disappeared among the graves at Zhizdra location, not far from Kaluga.

Zhiloi (Chilov) (Pers. – Ronie , then – Shahidan, Rus. – “Zhiloi”, this name is associated with fishing development in old times and with permanent habitation on fishermen’s island) – an island of the Apsheron Archipelago in the Caspian Sea, Azerbaijan, 79 km east of Baku. Its area around 6 km², and its height is under 9–10 m. Structured by sand-clay rocks and covered with shell sand, it has scarce, steppe vegetation. On the eastern shore is Zhiloi, a township. Oil recovery from a sea field occurs here.

Zhuz – one of three class-family, socially detached associations that evolved in the course of historic development of Kazakhs. The most numerous Z. – Srednii (“Middle”) (Orta) – steppe areas of Kazakhstan, the valleys of the Syrdarya River, Ishim River, Tobol River; the most possessive one – Starshii (“Senior”) (Upy) – Seven Rivers Area; the most belligerent – Mladshii (“Junior”) (Kishi) – West Kazakhstan.

“Zoroastr” – world’s first bulk oil tanker and prototype of present-day tankers. Designed by Ludwig E. Nobel and built in Sweden at the ship-building yard “Motall Ship Factory” in 1878 as per the order of the oil joint-stock company “Kavkaz and Merkurii” for the oil-industry partnership, “The Nobel Brothers,” which dealt with the carriage of oil products on the Caspian Sea.

The tanker was named in honor of the Persian philosopher and the founding father Zoroastrianism (Zoroastr). The tanker arrived in Petersburg on its own, whereupon the tanks were delivered via the Mariinsk system separately due to the ship’s draft. Eight insertable cylindrical tanks were mounted in the hull of Z.; however, these were later removed and oil began to be transported inside the hull proper. The tanker hull was made of steel, and its steam-engine and boiler operated on a liquid fuel and were housed in the hull’s mid-section. Especially to accommodate Z., the wharf and shore structures in Baku were remodeled. A specialized pipeline was arranged for tanker filling. A steam-driven pump was mounted on Z. for cargo pumping into barges. Its displacement was 400 t, its cargo carrying capacity was 240 t, its length was around 56 m, its width was 8 m, and its speed was 10 knots. Z. was sunk among 7 ships to prepare the foundation for drilling platforms near Neftyaney Kamni.

Zoroastrianism – ancient Persian religion of dualism that emerged in the tenth to seventh centuries B.C.E. and spread in Central Asia and Azerbaijan. The prophet Zarathushtra (Zoroastr) is believed to be the founding father of this religion. The writing of Gat – the most ancient part of Z. sacred book – Avesta, and bringing together of the primary religious ideas of ancient Persians are attributed to him. Z.’s basic idea is the recognition of the struggle between two eternal forces: Akhramazda (hence, another name for Z., – Mazdaism) and Ankhra-Manyu (with ancient Greeks – Ormuzda and Arimana). Akhramazda personifies light, the good,

truth, and life, while Ankhra-Manyu is darkness, evil, untruth, and death. The world is the arena for the struggle of these forces, and people who have a freedom of choice also participate in this struggle. Efforts of those siding with Akhuramazda should eventually result in a victory of light and the good.

Z.'s dualist concepts reflected the special features of public life of the ancient Iranian tribes that engaged in arable agriculture and often suffered from the attacks by nomads that brought devastation and death with them. Z.'s dualism affected the teaching of Maniheys, Publikians, Qatars and others. Besides, Z. contains the teaching of Maniheys about Last Judgement and the blazing space catastrophe of Doomsday, when the sinners and Ankhra-Manyu die, while the followers of Akhuramazda are absolved in the fire aided by the savior Mitra who will raise some people from the dead. The name of Mitra, albeit not mentioned in the ancient texts, was quite popular with common people. Mitra was considered an ally and envoy of Akhuramazda. Z. thought it was godly to build up material wealth through arable agriculture, irrigation allegedly having been made available to the people by Akhuramazda. The contemporary followers of Akhuramazda, the Pars, regard entrepreneurship also to be godly. The cult of Z. boils down to the honoring of the sacred fire to which the temples were dedicated. At present, Z. is still practiced by the Pars in Bombay and the fire-worshippers in Iran.

Chronology of the Key Historical Events on the Caspian Sea in the 17th–21st Centuries

From ancient times, the Caspian Sea has been a focus of attention, first from Merchants, and later on from pioneer travelers. The most important trade roads passed through this sea: along the Volga to the Baltic Sea, over the Caucasian neck to the Black Sea, over the Caspian deserts to Khiva and Bukhara.

The information about the Caspian Sea and its coasts was first found in treatises of authors from antiquity, including the Greek and Roman scholars and geographers like Strabon, Plutarchus, Appian, Anaximandra, Hekate Miletus, Aristotel, Herodot, Eratosthenes and others. With the extension of Islam and the widening of the Arab Caliphate, the Caspian region drew the special attention of Arab conquerors and, consequently, Arab scientists. Conquering and development of the Caspian territories started much earlier than Christian religion was established in Russia and Islam in the south of the Caspian. The Southern Caspian was conquered by Abbasides in 760–761.

Well-known historian Ali al-Masudi wrote that the first Russians appeared on the Caspian in approximately 880 when they took by assault the Abaskun Island.¹ L. Gumilev described the same event as follows: “. in 909, the Russian boats appeared on the sea and destroyed the Abaskun Island.² Next year the Russians attacked Mazandaran, but were defeated and left the place. In 913, a large fleet numbering 500 vessels . . . entered the Caspian Sea and plundered the coast of Gilan, Tabaristan, and Shirvan.”³ In the ninth century, the Volga-Caspian route became the main trade road for exchange of goods between Rus’ and the Middle East countries. “Russian merchants sailed on vessels along the river . . . Volga . . . from the Khazar capital to the Djurdjana Sea,” wrote Arab scholar Abdul Kasum in the 860 s–870 s in his “Book of Roads and States”

In 965, Prince Svyatoslav defeated the Khazar Khanate in the Lower Volga and first controlled the trade route along the Volga River–Caspian Sea. In addition, one

¹A.A. Makovsky, B.M. Radchenko, “*Kaspiiskaya Krasnoznamennaya*”, Moscow, 1982, p. 4.

²This was confirmed in the work of Iranian historian Ibn-Isfendiari (Sardari R. Une chapitre de l’histoire diplomatique de Iran, Tehran, 1941, p. 3).

³L.N. Gumilev, *Drevnaya Rus’ i Velikaya Step* (Ancient Rus’ and Great Steppe), Mysl Publishers, Moscow, 1993, p. 188.

more assault of the Russians on 72 vessels to the Caspian Sea is known. It was in 1175.

In the thirteenth century, well-known traveler Willem van Ruysbroeck first found that the Caspian Sea is a closed basin.

In 1368, seafarer Abraham Cresques from Palma de Mallorca prepared the famous Catalanian Map on which the Amudarya flowed into the Caspian Sea. In 1374, merchant Luka Tarigo from Genoa made a successful journey to the Caspian, and in 1428, pirate merchants from Venice also went to the Caspian. In 1459, Fra Mauro in his “Earth’s Circle” depicted the Caspian Sea quite accurately. In 1558, Anthony Jenkinson traveled from England via Moscow and Astrakhan to Khiva and Bukhara and prepared a map of the Caspian Sea that provided its description.

In the fifteenth century (1468) Russian merchant Afanasy Nikitin made his famous journal from Tver to India via the Caspian and Persia.

On the interesting map of Ruikh (1507) that was reproduced by Nils Otto Gustaf Nordenskjold the Caspian Sea is presented as an irregularly rounded water basin. The Oxus and Yaksart (Amudarya and Syrdarya) rivers were shown to flow into the Caspian.

Later, Tsar Ivan the Terrible joined Kazan (1552) and Astrakhan (1556) Khanates and the northern coast of the Caspian Sea as far as the Yaik (Ural) River to the Moscow state. Conquering Astrakhan gave a strong impetus to development of Russia’s trade-economic relations. Russian merchants, being the main holders of money, had access to the Caspian Sea and made Astrakhan the center for trade with Bukhara and Khiva.⁴ Thus, Russia fully controlled the Volga-Caspian water merchant road.

From this time on the trade of Russia with the East became permanent (Uzbek Khanates, Persia, Nogai Horde, Trans-Caucasus). Now, the main trade route included the Volga, which became Russian through its whole length, and the Caspian.

In 1599, the Persian diplomatic mission, a member of which was Orudjбек, who later took the name of Don Juan the Persian (his god-mother was Margaret the Austrian, the Queen of Spain), traveled from Kazvin over the Caspian Sea to Astrakhan and then along the Volga as far as Rybinsk and via Arkhangelsk to Europe (Germany, Italy, and Spain).⁵

Active use by Russia of the Caspian Sea in the sixteenth century was confirmed by the fact that many Russian captives could be found in the cities of Central Asia. “That time the number of Russian captives . . . in the cities of Central Asia was

⁴M.D. Chulkov, *Historical description of Russian commerce in all ports and with all borders from the ancient times to the present and all deeds of Emperor Peter the Great and happily reigning Empress Catherine the Great* written by Mikhail Chulkov (in 7 volumes, 21 book), vol. 2, book 2, Saint-Petersburg-Moscow, 1781–1785, pp. 3–5.

⁵The description of this travel “Notes of Don Juan the Persian” was included into the book “Caspian Transit. World of Lev Gumilev”, vol. 1, 1986, pp. 394–449.

rather great. These were mostly fishermen and merchants captured on the Caspian Sea by the Turkmens.”⁶

Despite the danger, however, the Russian merchants did not restrict their activity by Astrakhan and nearby regions, but went to the farther Caspian regions, such as Derbent, Baku, Shemakha and others and from there to Persia. Thus, in the sixteenth century, Baku became one of the major ports in the East and had two fortresses. At that time, the city traded extensively in silk, salt, and other commodities as well as oil, the daily production of which reached 200 kharvars (donkey’s bales).⁷

By the seventeenth century, Moscow merchant Fedot Kotov had already described in detail the Caspian ports and included this description in his narrative “About Traveling to the Persian Empire.” In 1633, Isaac Massa, a Dutch grain trader, traveller, cartographer and diplomat, gave a distorted presentation of the Caspian Sea on his map, and in 1636 (by other sources 1647), German scientist and traveller Adam Olearius showed the Caspian Sea on his map as a square. In 1668, another Dutchman, Jan Struys, who specialized in making sails and traveled over the Caspian Sea, prepared a map on which the sea extended from the north to the south. But in general the contours of the sea were far from reality. In Russia, the first attempt to survey the Caspian Sea was made on an order of Peter the Great by Sheltrup, but it ended tragically. The Dutchman was captured by the Persians and died in captivity.

In 1668–1669 Don Cossack Stepan Razin organized his Caspian march to Persia. During this time, the diplomatic missions of Russia went to the countries of Middle Asia over the Caspian Sea quite regularly. Astrakhan became one of the world’s shipbuilding centers where the Business Yard, a special state organization managing shipbuilding and sailing over the Caspian, was located.

In 1670, German geographer Johann Baptist Goman published his map named “Imperium Percicum,” on which the Caspian Sea was presented rather accurately.⁸

No matter how strange it may seem, until the early eighteenth century “Before Peter I practically every time the Caspian Sea was shown on maps on the basis of the information collected in Africa for one-and-half millennia, in fact, according to Ptolemy Alexandrian,” wrote renowned Russian scientist K.M. Baer.

The most important period in navigational, cartographical, and geographical studies of the Caspian Sea was the eighteenth century, which was an era of reforms initiated by Peter the Great. His strategy in foreign policy planned two “sea windows” of Russia to the foreign borders: in the north to Europe via the Baltic Sea and in the south to Persia and India via the Caspian Sea.

And from the eighteenth century, the rich history of this unique sea began in the same period that the legal status of the sea began to take shape.⁹

⁶Cited from S.V. Zhukovsky, “Relationships between Russia and Bukhara and Khiva in the Last Three Centuries”, Petrograd, 1915, p. 16.

⁷N.V. Vodovozov, “Notes of Afanasy Nikitin about 15th Century India”, Moscow, 1955, p. 16.

⁸P.A. Chikhachev, “Notes about the East”, Nauka Publishers, Moscow, 1982, p. 212.

⁹For more details see I.S. Zonn, “Caspian Vector of History”, Caspian Bulletin, Moscow, 2003, No. 1.

17th century	
1699–1700	Following the decree of Peter I, the first investigations in the Volga River flow into the Caspian Sea were initiated.
1700	<ul style="list-style-type: none"> ● Cartographer Guillom Delille (1675–1726), at the court of French King Louis the XIV, published in Paris the map of the Caspian on which the sea width was the same as its length. The Oxus (Amudarya) was also depicted as flowing into the Caspian. The eastern coast was presented incorrectly. ● By the highest imperial order, the Mining Department was established to manage the underground resources in the Russian Empire.

18th century	
1701	<ul style="list-style-type: none"> ● By order of Peter I, the Navigational and Mathematical School was opened in Moscow. This was the first higher special educational establishment training sea navigators, geodesists and other specialists. Later on many of them studied the Caspian Sea. This was the birth of the Pilot Service of Russia. ● Semyon Remezov prepared the handwritten “Drawing Book of Siberia” comprising 23 maps. This was Russia’s first atlas. The maps presented the Caspian Sea extending from the north to the south.
1704	<ul style="list-style-type: none"> ● After 5 years of hard work, Captain Eremey Mayer (Meyer) from Germany, who was in the Russian service and in 1699 was directed by Peter I to the Caspian Sea, prepared the map of the Caspian Sea. ● It was decreed to transfer to the Treasury the Astrakhan fishery, subordinating it directly to the Fishery Department. The people from inland regions of Russia were moved to Astrakhan for development of the fisheries.
1705–1706	<ul style="list-style-type: none"> ● Riot of the Astrakhan people after the Tsar’s decree prohibiting beards and mandating dress in Russian clothing. ● Strelets revolt in Astrakhan against taxes and arbitrary ruling. It was suppressed by Field Marshall B.P. Sheremetev. During this revolt, Eremey Mayer was killed and allegedly his map of the Caspian Sea was destroyed.
1708	Administrative management reform. Division of Russia into <i>guberniyas</i> (provinces). Astrakhan was included into the Kazan Province and boyar P.M. Apraksin was appointed its head.
1710	Governor of Kazan and Astrakhan provinces boyar (nobleman) P.M. Apraksin had a meeting between Cherny Yar and Astrakhan with Kalmyk Khan Ayuki to sign the Treaty “On Subordination of Khan Ayuki with Its Peoples to the Russian State” that reaffirmed the military service of the Kalmyks on the Russian border.
1712	Chinese diplomatic mission to Kalmyk Khan Ayuki.
1713	On the Tyub-Karagan Cape noble senior man of Mangyshlak Turkmen Khodja Nepes (Nefes) came to meet the Astrakhan merchants to hand them vital information for Peter I.

18th century	
1714	<ul style="list-style-type: none"> ● In Petersburg, Khodja Nepes told Peter I that “the gold sand was produced in the terrain lying along the Amu River and although this river that previously flowed into the Caspian Sea was now re-channeled by the Uzbek people to the Aral Sea for security from the Russians, but having destroyed the dam it was possible to direct the river into its former channel.” This information impressed greatly Peter I, and he signed the decree on organization of an expedition to Khiva headed by Captain-Lieutenant of Life Guards Prince Alexander Bekovich-Cherkassky. ● <i>The Caspian Sea level was –25 m</i> (according to B.A. Apollov, 1956).
1715	<ul style="list-style-type: none"> ● The first expedition of A. Bekovich-Cherkassky to the Caspian Sea. The first most accurate map of the Caspian Sea was prepared. The whole eastern coast of the Caspian as far as the Astrabad Bay in the south was described. It was noted that the Amudarya does not flow into the Caspian. ● The senior classes of the Navigational and Mathematical School were moved to Saint Petersburg where some time later on their basis the Maritime Academy opened.
1716	<ul style="list-style-type: none"> ● The second expedition of A. Bekovich-Cherkassky along the Caspian’s eastern coast. Three fortresses (“defense fortifications”) were constructed there: the first was the St. Peter Fortress in the Tyub-Karagan Bay; the second was on the shore of the Aleksandrbai Bay, and third was on the Krasnovodsk Spit near the Kyzyl-Su spring (meaning “red water”), where, in the late nineteenth century, the city of Krasnovodsk was founded. ● Peter I sent a diplomatic mission to Persian Shah Sultan Hussein headed by Lieutenant-Colonel A.P. Volynsky who managed to establish friendly relations between Russia and Persia and did much for acceptance of the Russian resident at the Shah’s Court. ● Peter I sent Lieutenant Alexander Kozhin to the Caspian for preparation of a detailed map of the sea.
1717	<ul style="list-style-type: none"> ● The third expedition of A. Bekovich-Cherkassky to Khiva where he was killed. He went there together with Khodja Nepes. ● The Astrakhan Province was formed on the southern territory of the Kazan Province. ● The Russian Consulate Service was opened in Astrakhan pursuant to the Russian-Persian Trade Treaty concluded by A.P. Volynsky. ● Travel of Peter I to France where, in particular, he met Guillom Delille and assured him that the Oxus (Amudarya) did not flow into the Caspian Sea. Peter I also showed him the map of A. Bekovich-Cherkassky on which a large bay near the eastern coast was shown (later on it was called Kara-Bogaz-Gol). ● Van Keulen made a copy of the Caspian Sea map made by Jan Struys and published it in an enlarged form as a separate sea map.
1718	<p>Peter I ordered hydrographic works on the Caspian Sea to be continued by Navy Lieutenant V.A. Urusov and Lieutenant A.I. Kozhin, who repeated surveys of the northern and eastern coasts.</p>
1719	<ul style="list-style-type: none"> ● Peter I organized the expedition headed by Captain-Lieutenant Carl van Verden and comprising Lieutenant F.I. Soimonov, V.A. Urusov, junior officers P. Doroshenko, and G. Zolotarev for surveys and description of the western coast of the Caspian Sea from Astrakhan to Kura River.

18th century	
	<ul style="list-style-type: none"> ● Colonel A.P. Volynsky was appointed Governor of Astrakhan (1719–1725). He was in charge of organizing and supporting the campaign to Persia. ● Ivan Zotov made a copy and translated into Russian the Caspian Sea map prepared by Van Keulen, made some additions, and presented it to Peter I.
1720	<ul style="list-style-type: none"> ● The expedition of Captain-Lieutenant Carl van Verden and Lieutenant F.I. Soimonov continued works on the southern coast of the Caspian Sea. As a result of this work, “a plain chart of the Caspian Sea from the Yarkovsky mouth to the Astrabad Bay, the elevations of which were given in degrees and minutes, while the depths in sazhen and feet,” was prepared. This map was the world’s sensation; it was the first map that had shown correctly the dimensions of the Caspian and configuration of its shores. ● Peter I prepared the “Maritime Code including everything having relation to good management of the fleet at sea.”
1721	<p>Peter I, being an Honorary Member of the French Academy of Sciences, sent to Paris a copy of the Caspian Sea map prepared by Carl van Verden and F.I. Soimonov.</p>
1722	<ul style="list-style-type: none"> ● Peter I, on board the 18-oar boat “Moskvoretsky tok,” arrived in Astrakhan where he declared war on the Persian rebels. ● Following the Decree of Peter I, a military port was established in Astrakhan and construction of a big dockyard was initiated. ● The Caspian Navy based in Astrakhan was created. ● Persian “Downstream” campaign of Peter I. The fleet, consisting of 274 vessels under command of Aide-de-Camp General Fedor Matveevich Apraksin, left Astrakhan and went into the Caspian Sea. The whole western coast of the Caspian and Northern Persia were seized. ● Geographer J. Ottens from Amsterdam prepared a map of the Caspian Sea on which it was marked that it was made up on the basis of the Russian original (perhaps, the E. Mayer map). ● Van Keulen used the map of the Caspian Sea made by Jan Struys, and having added the new material, handed it over to E. Mayer and Carl van Verden for preparation of a new map.
1722–1723	<p>Russian-Persian War. The main goal of Russia in this war was the invasion in India.</p>
1723	<ul style="list-style-type: none"> ● Large military expedition – known to history as the Baku expedition – ended in seizure of Derbent and Baku by Russian troops. ● Russian-Persian Peace Treaty of September 12 signed in Saint Petersburg by Peter I and Ismail-Bek. Recognition by Persia of the rights of Russia to the western and southern coast (Gilan, Mazandaran, and Astrabad (Gorgan) provinces) of the Caspian Sea. It declared the establishment of good friendly relations and free trade between the two countries. ● Guillom Delille published his new map of the Caspian which was a copy of F.I. Soimonov’s map, but all names were translated into Russian. ● Peter I signed the decree that allowed the Kalmyk people of Khan Ayuki to cut the forests (except for the oak trees).
1724	<ul style="list-style-type: none"> ● Russian Academy of Sciences was founded in Saint Petersburg by the Decrees of Peter I and Senate (January 28). It was originally called “The Saint Petersburg Academy of Sciences”.

18th century	
	<ul style="list-style-type: none"> • The fortress “Saint Cross” was constructed on the Sulak River. • Peter I attracted Tatar servicemen from Kazan to the work on the Caspian Sea.
1726	<ul style="list-style-type: none"> • Carl van Verden was busy in Astrakhan with “enlargement of the Caspian Sea map to mark all newly conquered provinces and berths, as well as harbors, rivers, fortresses, and sea roads.” • The Caspian expedition headed by F.I. Soimonov explored the Caspian coasts. • Sailing master Dolmatov on two vessels “Tsaritsyn” and “Astrakhan” was sent to describe the Emba Bay. • <i>The Caspian Sea level was –25.4 m</i> (according to B.A. Apollov, 1956).
1727	Russian troops conquered the Astarsky, Lenkoran, and Kizigalaksy districts near the Caspian Sea.
1728	Johann-Gustav Herber prepared the map of the Circum-Caspian areas and their description.
1729	<ul style="list-style-type: none"> • Commander of the Russian troops on the Caucasus General V.Ya. Levashov signed the Treaty with Isfahan Shah Esref under which Iran received back the Astrabad and Mazandaran provinces. It was annulled in 1730. • The first map of Apsheron Peninsula showing oil pits was prepared.
1730	Lieutenant A. Nagaev was sent to Astrakhan for preparation of a description of the Caspian Sea.
1731	<ul style="list-style-type: none"> • On the basis of the materials collected by the F.I. Soimonov expedition the Atlas consisting of 8 maps, “Description of the Caspian Sea with its general map and atlases of particular maps,” and Pilot of the Caspian were prepared. • Admiralty Collegium published the first journal of F.I. Soimonov named “Description of the Caspian Sea from the Volga mouth, from the Yarkovsky channel to the Astrabad River mouth.” • Appeal to grant Russian citizenship to the Kazakh people in the Circum-Caspian region headed by Smaller Horde (zhuzha) Khan Abul Khair was handed over to Russian Ambassador A. Teftelev.
1732	<ul style="list-style-type: none"> • The Rasht Treaty (January 21, Rasht, Persia) was concluded between Russia and Persia. Return to Persia of the Caspian southern coast that was captured by Russia during the Russian-Persian War of 1722–1723. In return, Russia secured the right to duty-free and transit trade in Persia. Diplomatic relations were established. On the Russian side, the Treaty was signed by General Levashev and Full State Counsellor Baron Shafirov; on the Persian Shah side, Ambassador Murza-Mohammed Ibrahim Musteofi-Serkarikhaze (Cabinet Secretary) signed. The Treaty was ratified by Empress Ann on April 5, 1732. • Military doctor I. Lerkh completed the first stationary hydrometeorological observations on the Caspian Sea in Astrakhan, Baku, Derbent, Nizovaya Pristan, and in the Sulak River mouth. • The first meteorological observations were carried out on the Caspian Sea.

18th century	
1734	Russia signed a trade treaty under which British merchants were permitted to trade with Oriental countries using transit via the territory of Russia.
1735	Russia and Persia concluded the Ganja Treaty of “eternal union.” Russian troops were moved from the captured territories beyond the Terek River. Persia received Baku and Derbent and control over Daghestan.
1735–1736	The Caspian Fleet was sold to private owners.
1736	<ul style="list-style-type: none"> ● Construction of the fortress in Kizlyar on the Northern Caucasus. ● Publication by the Russian Academy of Sciences of the map of the Circum-Caspian regions prepared by Colonel J.G. Herber.
1737	Kriegs-Kommissar (War-Commissar) F.I. Soimonov negotiated with Kalmyk leader Donduk-Ombo the provision of the required number of the Kalmyk people for strengthening of the military corps of Aide-de-Camp General P.P. Lassi who was fighting in the Crimea. As a result, Donduk-Ombo sent a 10,000 man detachment under command of his son, Galden-Normo to the Crimea.
1739	<ul style="list-style-type: none"> ● The Geographical Department headed by outstanding mathematician Leonhard Euler was set up at the Russian Academy of Sciences. The Department was assigned preparation of the General Map and Atlas of Russia. ● F.I. Soimonov published his textbook on ship navigation named “Extract on the art of navigation from sciences related to sailing presented in questions and answers for the use and security of seafarers.”
1740	On the Caspian, with permission from Russia, was created the British Merchant Company headed by Captain John Elton with Master Thomas Woodruff and historiographer M. Jonas Hanway. This company did not exist for long (only until 1743). During this time, Woodruff, on the vessel “Empress of Russia,” which was built in Kazan, made several crossings of the Caspian Sea between Russia and Persia. T. Woodruff wrote the Sailing Directions and prepared the map named “A plain chart of the Caspian Sea”, according to the observations of Captain John Elton, author of the “Elton’s quadrant.” Thomas Woodruff, Master of the British ship “Empress of Russia,” who navigated this sea for 3 years, presented it to M. Jonas Hanway of Saint Petersburg in 1745.
1741	General-Lieutenant V.N. Tatishchev, a statesman, geographer, and outstanding historian, was appointed the Governor of Astrakhan and head of the Commission on Kalmyk Affairs.
1744	<ul style="list-style-type: none"> ● Initiation of construction of the canal between the Volga and Kutum Rivers in Astrakhan for flood control. The idea of construction of this canal was suggested by Peter I. The canal was built in 1764, but it was often clogged. It was finally finished in 1817. ● First investigation and cartographic survey of the Astrakhan-Kizlyar tract.
1745	<ul style="list-style-type: none"> ● Master I. Konstantinov and Lieutenant D. Bezborodov on the centerboard boat “Som” described the main arm of the Volga and conducted a survey of the northeastern coast of the Caspian Sea from the Yarkovsky mouth to Karagua (Tyub-Karasu) in the Mertvy Kultuk Bay.

18th century	
	<ul style="list-style-type: none"> • V.N. Tatishchev presented to Admiralty Collegium the map of T. Woodruff, suggesting at the same time to conduct a full survey of the Caspian Sea. • The first scientific geographic atlas “Atlas of Russia” was prepared. It consisted of 19 maps of particular terrains and one general map. One of the maps was named “Area between the Black and Caspian seas representing Kuban and Georgian land and the remaining part of the Volga River with its mouth.” On this map the Caspian Sea was named Khvalynsky.
1746	Russia annulled Art. 8 of the 1734 Trade Treaty with Britain. After this, British merchants were prohibited to travel to Persia and to deliver commodities via the territory of Russia.
1747	<ul style="list-style-type: none"> • Persia disintegrated, resulting in the formation of several independent states. • Captain John Elton, who had his own military ship and who was in the service of the Persian Shah Nadir, was killed. • In Astrakhan, the Fishery Division that was in charge mainly of allotment of fishing places and their protection from their trespassing by other persons was organized. It existed until 1797.
1748	The 2nd edition of F.I. Soimonov’s Pilot of the Caspian Sea was published.
1752	I. Berkh began stationary observations over the Caspian Sea level in Baku, Derbent, and other places on the western coast of the sea.
1753	In London, the book of M. Jonas Hanway, “A historical account of the British trade over the Caspian Sea,” vols. 1–2, 683p., and the map of T. Woodruff were published.
1757	Georges Louis Leclerc, Comte de Buffon, a French natural scientist (1707–1788), outlined a plan to link the Azov and Caspian Seas along the Manychs and received support from Academician P.S. Pallas.
1760	<ul style="list-style-type: none"> • Admiral A.I. Nagaev prepared the general map of the Caspian Sea according to maps of F.I. Soimonov, T. Woodruff, and others. • <i>The Caspian Sea level was –24.4 m (according to B.A. Apollov, 1956).</i>
1762	<ul style="list-style-type: none"> • Master I. Panin made a record of the southern coast of the Caspian. • Empress Catherine II passed the fishing and seal hunting areas in Astrakhan to management of merchants on condition that they would never be owned by one person.
1763	The journal of the Academy of Sciences, “Monthly Treatises and News on Scientific Matters,” published the work of F.I. Soimonov, “Description of the Caspian Sea and Russian gains there as a part of history.”
1764	Captain-Lieutenant Nagatkin, using the first descriptions of the I.V. Tokmachev and I. Panin expeditions, prepared the general map of the Caspian Sea that was handed to Empress Catherine II.
1764–1766	On the Caspian, the expedition headed by Captain-Lieutenant I.V. Tokmachev, the Astrakhan Port Chief, and Engineer-Major L.L.

18th century	
	Ladyzhensky prepared descriptions of the Caspian eastern coast. Carrying out surveys on the Cheleken Island, they found that during a year the local population extracted 4 thou <i>poods</i> (1 <i>pood</i> = 16.38 kg) of oil from 20 pits.
1765	I.V. Tokmachev mapped Astrabad Bay.
1766	All maps and descriptions of the Caspian Sea were handed over by I.V. Tokmachev and L.L. Ladyzhensky to Admiral A.I. Nagaev for preparation of the map of the Caspian Sea, but because of his death in 1780, the map was not finished.
1768–1774	First academic expeditions by Academicians S.G. Gmelin (1745–1774) and P.S. Pallas (1741–1811) provided the first geological and biological data about the Caspian in retrospect.
1771–1773	Academician Johann Anton Gldenstdt conducted surveys of the Caspian Sea coast.
1777	<ul style="list-style-type: none"> • In the “Petersburg Journal,” published in the German language, the article “About Caspian Sea Harbors” to which the map of Academician Johann Anton Gldenstdt was attached appeared. • The church calendar for 1777 included the Russian version of the Johann Anton Gldenstdt’s map entitled “Map of the Caspian Sea made in 1776 according to the newest data.”
1778	Admiralty Collegium was ordered to build a Naval Fleet in Kazan that 2 years later was sent to Astrakhan.
1780	<ul style="list-style-type: none"> • Death of Admiral F.I. Soimonov in Moscow at the age of 98. • A.V. Suvorov was given a secret order from G.A. Potyomkin to come to Astrakhan.
1781	The expedition of M.I. Voinovich to the Caspian Sea pursued largely political and economic aims. Voinovich observed the fluctuations of the sea level and conjectured that oil should occur in the sea bottom near the Renos (Zhiloy) Island. The Astrabad and Krasnovodsk Bays as well as Dervish and Cheleken Islands were described.
1784	British traveler G. Foster visited Baku and noted that sticky oil (<i>kir</i>) was used cover the roofs of houses to protect them from atmospheric precipitations.
1785	The Astrakhan Province was liquidated and its territory was included into the Caucasus Province (vicegerency).
1790	Astrakhan became the center of the Caucasus Province.
1793	The general map of the Caspian Sea was prepared on the basis of the materials left by A.I. Nagaev “from the maps available at the Admiralty and corrected by Admiral Nagaev on the basis of maps and descriptions prepared in different times” (on the basis of materials of the I. Panin, I.V. Tokmachev, and L.L. Ladyzhensky expeditions and M.I. Voinovich’s data). It was published in 1796.

18th century	
1796	<ul style="list-style-type: none"> ● Russian-Persian War. March of Count V.A. Zubov from Astrakhan over the Caspian Sea to Persia. Derbent, Kuba, Baku, and Ganja were occupied. ● Caucasus Province was renamed Astrakhan Province. ● P.S. Sapozhnikov organized his own caviar house in Astrakhan.
1797	Russian troops were moved from Persia; they voluntarily left Georgia and Azerbaijan.
1800	<ul style="list-style-type: none"> ● Active State Counsellor I.S. Zakharov, the Astrakhan Governor, was dismissed from his position for non-fulfillment of the orders on “settlement of peoples on the lands of the Astrakhan Province.” ● A naval base was created near Sara Island for protection of trade routes and Russian interests on the Caspian.

19th century	
1801	The Bukeevsky Horde (Internal Horde), Kazakh (Kyrghyz) Khanate, and vassal of Russia was formed between the Ural and Volga rivers.
1802	Astrakhan Province was divided into Astrakhan Province and Caucasus Province. Until 1832, Astrakhan Province was subordinate to the military commander of the Caucasus Territory and Georgia.
1803	<ul style="list-style-type: none"> ● Fishery Inspection was established in the Volga-Caspian fishery zone. ● “Special Regulations” – the law of the Russian Empire regulating fishing in the Caspian Sea were passed.
1804	<ul style="list-style-type: none"> ● Larin, a Russian hydrographer, prepared the handwritten pilot of the Caspian Sea. ● The Ganja Khanate, a state in Azerbaijan located in the Kura River valley, was included into the Russian Empire.
1804–1813	Russian-Persian War. Initiated by Persia after Russia rejected the ultimatum to withdrawal its troops from Transcaucasia.
1805	<ul style="list-style-type: none"> ● Accession of Karabakh and Shirvan to Russia. ● Establishment of the State Admiralty Department supervising hydrographic surveys.
1806	<ul style="list-style-type: none"> ● Russian troops under command of General I. Glazenap and later by N. Bulgakov occupied Derbent and Baku. ● Setting of a ten-versta alienation strip along the Volga and Caspian shores that left nomads without adequate winter pastures.
1807	<ul style="list-style-type: none"> ● Map of the Caspian Sea prepared by L.I. Golenishev-Kutuzov “on the basis of the most recent descriptions and maps” (prepared in 1800) was published. ● In Astrakhan, the position of the military Governor was created to oversee and command the Caspian Fleet (it existed until 1869). ● Senate passed an ordinance giving owners, for certain payment, rights to catch fish in sea areas adjoining their estates.
1808	Admiralty Department ordered “to prepare the full atlas of the Caspian Sea.” The task was entrusted to sailing master A.E. Kolodkin (1776–1851).

19th century	
1809	Karl Gablits published the results of the M.I. Voinovich expedition together with a map entitled, “Map of the Caspian Sea prepared on the basis of descriptions and additions made by the Russian fleet while sailing over the sea in 1781 and 1782.”
1809–1817	A.E. Kolodkin studied the Caspian Sea and its coast. During this time, he prepared tables of coordinates for 46 geographical points.
1812	Great Britain signed a treaty with Persia that envisaged creation of a Persian Navy under British command on the Caspian Sea.
1813	<ul style="list-style-type: none"> ● Russian army captured the Lenkoran fortress. ● The Gulistan Peace Treaty with Persia, signed in the Gulistan area near the Zaive River in Karabakh on October 12, ended the Russian-Persian War (1804–1813). The territories of Northern Azerbaijan and Daghestan were joined to the Russian Empire. Russia was given exclusive right to keep its Navy on the Caspian. The Treaty was signed by General-Lieutenant N.F. Rtishchev, on the Russian side, and by Mirza-Abul-Khassan-Khan, on the behalf of the Persian Shah. ● The Russian government applied the buy-out system (it existed till 1829) and issued special permits for oil development to buy-out men. ● French secret agent Adam Moretti, disguised as Peter Ivanov, a local teacher, was detained in Astrakhan. He had been gathering intelligence for Napoleon’s march to India via Russia. ● <i>The Caspian Sea level was –24.5 m.</i>
1816	Astrakhan Governor S.S. Andrievsky prohibited the hunting of seals in the Caspian Sea by the so-called “chase manner,” by which the seals were forced into specially installed nets by loud noise created by shots from guns and cannons.
1817	<ul style="list-style-type: none"> ● Formation of the Astrakhan Cossack troops. ● Completion of the Astrakhan Canal (Varvatsievsky) connecting the Volga and Kutum Rivers, enabling passage of boats and small vessels (construction began in 1744).
1819	Official establishment of the fishery company “Sapozhnikov Brothers” in Astrakhan.
1819–1820	Expedition of Headquarters Captain N.N. Muravyov (1794–1866) that studied the eastern coast of the Caspian Sea. He founded the Voskresensk Fortress on the Krasnovodsk Spit.
1821	Local oilfields primitively developed by shallow pits on the Apsheron Peninsula were transferred on lease to Mirzoev, the future oilman.
1823	Not far from Mozdok City (Northern Caucasus), the Dubinin brothers – Vasily, Gerasim and Makar – being simple peasants, constructed the world’s first oil refinery, installing intermittent-action stills there.
1823–1826	Captain-Lieutenant of the Caspian Fleet G.G. Basargin headed the hydrographic expedition that studied the northwestern coast of the Caspian. He prepared the Caspian Sea map from Lenkoran to the Kura River mouth.

19th century	
1825	<ul style="list-style-type: none"> ● Expedition of Carl Eduard von Eichwald, zoologist, Corresponding Member of the St. Petersburg Academy of Sciences, and mining engineer N.I. Voskoboinikov to the Caspian to study the sea fauna and the Circum-Caspian areas (Cheleken Island, Kranovodsk and Balkhansky Bays). ● In Baku Province, 125 pits up to 5 sazhen deep on average gave 21,085 poods of oil annually were operated (according to N.I. Voskoboinikov data).
1826	Atlas comprising 17 maps of the Caspian Sea prepared by A.E. Kolodkin on the basis of survey results was published.
1826–1830	<ul style="list-style-type: none"> ● Abolition of the Kazan Admiralty and transfer of the shipyards and Admiralty workshops to the naval port in Astrakhan. ● Establishment of Admiralty in Kazan and beginning of the construction of ships for the Caspian Fleet.
1827	The State Admiralty Department was reorganized to form two independent establishments: the General-Hydrographer Department and the Maritime Scientific Committee (hydrographic depot).
1826–1828	Second Russian-Persian war fought over the Eastern Trans-Caucasus.
1828	Treaty of Turkmenchay was concluded on February 10, ending the second Russian-Persian War (1826–1828). The text of the Treaty was prepared by A.S. Griboedov (1795–1829), the celebrated Russian playwright and future Russian Ambassador to Persia (1828). According to Article 8 of this Treaty, Russia reaffirmed its exclusive right to have a fleet on the Caspian Sea.
1829	<ul style="list-style-type: none"> ● The Demarcation Commission signed in Bairamly the so-called “Description of the Border” between Persia and Russia. This was the final action on the demarcation of the border set by the Turkmenchay (Arapchay) Treaty. ● Great German naturalist and explorer Alexander von Humboldt, with the support of Russian Minister of Finance E.F. Kankrin, visited the shores of the Caspian Sea and conducted observations over its water level. ● Near Baku, 82 manually dug oil pits were in operation. ● Russian Ambassador A.S. Griboedov was killed in the Embassy in Tehran by the mob of Persians (February 11).
1830	<ul style="list-style-type: none"> ● Emiliy Kh. Lents, famous Russian physicist, oceanographer, Member of the St. Petersburg Academy of Sciences, was sent to Baku where he installed two benchmarks, one in Baku and the other on Nargen Island in Baku Bay, to identify the reasons for and the nature of the water level fluctuations of the Caspian. ● <i>The Caspian Sea level was –25.7 m (according to depth gauge observations).</i>
1831	“Atlas of the Volga mouth and part of the western coast of the Caspian Sea” prepared by Vice-Admiral G.G. Basargin was published.
1832	G.S. Karelin (1801–1872) was sent to the Caspian Sea to study its northeastern coasts.
1834	<ul style="list-style-type: none"> ● Second travel of G.S. Karelin to the Caspian, this time to the Mertvyi Kultuk.

19th century	
	<ul style="list-style-type: none"> ● G.S. Karelin initiated construction of the Novo-Aleksandrovskoye fortification in Kaidak Bay on the Kyzyl-Tash Escarpment. ● A pioneer of geological studies of the Caspian Sea, Carl Eduard von Eichwald noted in his work “Travel to the Caspian Sea and Caucasus” that the many-year fluctuations of the sea water level were caused by the vertical displacements of the sea bottom. ● F. Goebel conducted the first study of the chemical composition of the Caspian water.
1836	<ul style="list-style-type: none"> ● G.S. Karelin together with his helpmate Captain I.F. Blaramberg sailed on boats along the southern and northern coasts of the Kara-Bogaz-Gol Bay. ● Secret expedition organized by the Naval Ministry and headed by G.S. Karelin on the ship “St. Gabriel” sailed to the southeastern coast of the Caspian Sea. ● The Government of Persia appealed to Russia to send two military ships to Astrabad Bay to help suppress the Turkmen riot. ● The atlas of maps of the Caspian Sea prepared under guidance of A.E. Kolodkin was published.
1837	<ul style="list-style-type: none"> ● The customs division in Baku started making regular instrumental observations of the Caspian Sea level using a depth gauge. ● In Balakhany settlement (near Baku), N.I. Voskoboynikov constructed a plant to produce “lighting oil,” the prototype of modern kerosene. ● The Hydrographic Department was founded in Saint-Petersburg. ● The Artemiev brothers were the first to install an oil tank onboard a ship (the small schooner “Alexander”). It was filled and drained with the help of a manual pump.
1838–1839	The chronometric expedition was sent by the General Headquarters of Russian Army to the Persian coast of the Caspian.
1839	Captain 1st Rank E.V. Putyatin (1803-1883) submitted a plan for surveys and depth measurements of the Caspian Sea. It was not implemented.
1840	<ul style="list-style-type: none"> ● The Caspian Region was formed on the territory of Eastern Trans-Caucasia that was included into Russian Empire under the Gulistan Treaty of 1813. Its center was Shemakha. ● Permanent sea patrol of the Iranian and Turkmen coasts by Russian Navy was organized in response to the activity of Britain in Persia and Middle Eastern countries. ● British Captain James Abbott with a small detachment of Khiva people traveled from Khiva to Saint Petersburg via Aleksandrovsk, a military fortification on the Caspian shore, with a letter to Tsar Nikolay asking for a stop to military operation against Khiva. ● British Lieutenant Richmond Shakespear, a cousin of novelist William Makepeace Thackeray, accompanied by 416 Russians released from captivity marched from Khiva via Fort Aleksandrovsk on the Caspian. On three ships, they sailed over the Caspian, continuing their travel to Orenburg and then on to Saint Petersburg where they were received by Tsar Nikolay.
1842	The operative Russian Navy station for protection of merchant ships on the Southern Caspian was constructed on the Ashur-Ade Island (Persia) near the inlet into the Gorgan Bay of the Caspian Sea.

19th century	
1843	<ul style="list-style-type: none"> ● Establishment of the Sixth Division of His Emperor Highness Own Chancery for control of Trans-Caucasia. ● About 3.4 million kilogram of “black” oil and 14.143 million kilogram of “white” oil were produced near Baku. ● The shipping company “Po Volge” (along the Volga), one of the largest joint stock companies, was organized. In the early twentieth century, it possessed 4 tow vessels, 11 barges, 34 wharf boats, and 18 passenger vessels cruising between Nizhny Novgorod and Astrakhan and also ports on the Caspian Sea.
1844	<ul style="list-style-type: none"> ● Mining technician F. Semenov drilled the first productive borehole on the Caspian coast in Bibi-Eybat settlement near Baku on the Apsheron Peninsula. ● The Caucasian vicegerency was formed on the territories of the Caucasus and included into the Russian Empire in the late eighteenth to early nineteenth centuries (including the Georgian Province, Armenian and Caspian regions).
1846	<ul style="list-style-type: none"> ● On Tyub-Karagan (Mangyshlak Peninsula), the expedition headed by Headquarters Colonel N.M. Ivanin founded the Novo-Petrovsky fortification (future Fort Shevchenko). ● The Novo-Aleksandrovsky fort on the Kaidak Cape was destroyed. ● The Russian Consulate was opened in Astrabad. ● The Caspian Region was divided into Derbent and Shemakha Provinces. ● Otto Wilhelm Hermann von Abich surveyed the oil and gas fields near Baku, concluding that there were major reserves of oil on the sea bottom and on the islands.
1847	<ul style="list-style-type: none"> ● Lieutenant I.M. Zhrebtsov on corvette « Volga » prepared the first full hydrographic description (including depth measurements) of Karabugaz (Kara-Bogaz-Gol) Bay. ● In Nizhny Novgorod, the V.I. Ragozin Partnership on Construction of Oil Tank Schooners “Kaspii” was registered.
1848	<ul style="list-style-type: none"> ● The industrial scale oil development was started with drilling of the first oil well in Bibi-Eybat near Baku (produced no oil). This very well was constructed 11 years earlier than the first foreign well drilled in Titusville, Pennsylvania, USA, in 1859. ● Merchants V.V. Skrizhitsyn and N.A. Zhrebtsov founded the Shipping Company “Mercurii.” Regular cargo-passenger line Rybinsk-Astrakhan was organized.
1850	I.F. Blaramburg published his work “Topographic and Statistical Description of the Eastern Coast of the Caspian Sea from the Astrabad Bay to the Tyub-Karagan Cape.”
1850–1857	Ukrainian poet T. Shevchenko was exiled to the fort at Novo-Petrovsky.
1851	Lieutenant V.F. Petrushevsky of the Caspian Fleet presented M.S. Vorontsov, a Viceroy on the Caucasus, with his plan to inventory the Caspian Sea (not realized).

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1853	<ul style="list-style-type: none"> ● The Newsletters of the Emperor's Geographical Society published a letter of future Academician N.V. Khanykov (1822–1878) addressed to his friend Yu.A. Gegemeister, a well-known economist and statistician, geographer, and traveler, entitled, "Investigation by N.V. Khanykov of the Water Level Fluctuations in the Caspian Sea." ● Initiation of fishery studies on the Caspian and rivers flowing into it.
1853–1856	Research fishery expedition of K.M. Baer (1792–1862) and N.Ya. Danilevsky studied the ichthyofauna and water chemistry of the Caspian Sea and rivers flowing into it. As a result of these studies, "Scholarly Notes on the Caspian Sea and Its Surroundings" was produced.
1854	<ul style="list-style-type: none"> ● N.A. Ivashintsev on the vessel "Lenkoran" carried out reconnaissance surveys in the Western and Southern Caspian. ● Academician K.M. Baer persuaded Prince Dolgoruky-Kozhevnikov, a fishery supervisor, to salt the Caspian and Volga herring in barrels as was customary in the Netherlands. As a result, the sales of this herring called now "Astrakhan herring" rose.
1855	<ul style="list-style-type: none"> ● The plan for a chronometric expedition for hydrographic studies of the Caspian Sea was approved. It was prepared by O.V. Struve, astronomer of the Hydrographic Department and Director of the Chief Nikolaevsky Observatory. ● Construction of the Russian Navy port in Baku began.
1856	<ul style="list-style-type: none"> ● Russian democrat novelist A.F. Pisemsky took part in the "Literary Expedition" to the Lower Volga and Caspian coast. He visited Astrakhan, Baku, and the Tyub-Karagan Peninsula where he went to the fort at Novo-Petrovsky to release T.G. Shevchenko. ● The Shipping Company "Rusalka" (mermaid) started operating. ● In Astrakhan, the Department of Fishing and Seal Hunting on the Caspian was established.
1856–1867	The hydrographic expedition to the Caspian Sea headed by Captain 1st Rank N.A. Ivashintsev. A detailed description of the Caspian Sea was done under supervision of N.A. Ivashintsev and N.L. Pushchin.
1857	<ul style="list-style-type: none"> ● Russian entrepreneur V.A. Kokorev (1817–1889) founded the Trans-Caspian Trade Partnership for construction of oil refining works in Baku. ● Novo-Petrovsky Fort was renamed Aleksandrovsky Fort in honor of Emperor Alexander II. ● "Statute of Caspian Fishing and Seal Hunting" was submitted to the Russian Academy of Sciences. ● Wreck of iron vessel "Kuba" of N.A. Ivashintsev's expedition near the Shoulan Cape. As a result, 21 people died. ● In Surakhans, V.A. Kokorev constructed a factory to produce kerosene out of "kir," an asphalt-like substance.
1858	<ul style="list-style-type: none"> ● French novelist Alexander Dumas arrived to Astrakhan on the ship "Nakhimov." He hunted on the Caspian shores, and based on his experiences, wrote a geographical novel, "From Petersburg to Astrakhan". ● Nautical surveyor N.L. Pushchin conducted the first magnetic survey of the Caspian Sea with the help of a specially made gauge with hooks invented

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	and made by Lieutenant A.F. Ulisky and master Kharitonov. It functioned reliably to a depth of 420 sazhen (897 m).
1859	<ul style="list-style-type: none"> • V.A. Kokorev, P.I. Gubonin, and Baron N.E. Tornau from the Trans-Caspian Trade Partnership started construction of the first factory for production of paraffin and kerosene (first oil refining plant) in Surakhany settlement in Azerbaijan. • The Shemakha Province was renamed Baku Province with the capital in Baku. • The expedition headed by Colonel V.D. Dandeville surveyed the trade and strategically important points on the eastern coast of the Caspian Sea (from Guriev to Astrabad) and found a place in the Krasnovodsk Bay most suitable for construction of a fort.
1860	The Daghestan Region was formed and military control was established there. Its center was Derbent.
1860–1862	Russian zoologist and zoogeographer N.A. Severtsov (1827–1885) studied the Ural River, publishing the results in the article “Life of Red Fish in the Ural Waters and Its Significance for Ural Fishermen.”
1861	<ul style="list-style-type: none"> • Academician N.V. Khanykov (1822–1878) studied the nature and causes of century-long fluctuations of the Caspian water level in the period 915–1852 and published the work “Alternating Fluctuations of the Caspian Sea Level,” in which he concluded that they were caused by climatic and not geological factors. • The kerosene plant of V.A. Kokorev started operating in Surakhany.
1863	<ul style="list-style-type: none"> • D.I. Mendeleev defined the need to introduce a new technology – continuous oil refining. • N.A. Ivashintsev published the atlas of the Terek River. • Academician Otto Wilhelm Hermann von Abich (1806–1886), the “father of the geology of the Caucasus and Caspian Sea”, prepared the first geological map of the Apsheron Peninsula at scale 1:2,000.
1864	<ul style="list-style-type: none"> • N.A. Ivashintsev was elected the Corresponding Member of the Emperor’s Academy of Sciences and conferred the rank of a Rear Admiral. He was awarded the Konstantinovsky Medal, the highest award of the Russian Geographical Society, for his works describing the Caspian Sea. • In the course of the Caspian Sea inventory, Lieutenant A.F. Uralsky made several photostereoscopic pictures of the coasts from a moving ship. He also made pictures of the operating lighthouses on the Caspian Sea.
1865	<ul style="list-style-type: none"> • In a ravine with a stream, a settlement appeared in the Chernoyarsky uezd of the Astrakhan Region that would become the city of Elista (in the period from 1944 to 1957, it was named Stepnoy), the capital of Kalmykia. • By the highest ruling, the Statute of Caspian Fishing and Seal Hunting was approved (submitted in 1857). • The Committee on Caspian Fishing and Seal Hunting was established. This was the state supervisory body reporting to the State Property Ministry of the Russian Empire.

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1866	<ul style="list-style-type: none"> ● Observations over the Caspian Sea level were carried out from this time in the naval harbor and for this purpose a new depth gauge was installed on the Bailov Cape. ● The city of Temir-Khan-Shura became the center of the Daghestan Region. ● The Hydrographic Department of the Naval Ministry published the first astronomical part of the report prepared by N.A. Ivashintsev. The report contained a General Map of the Caspian Sea. ● Brothers D.I. and N.I. Artemiev started oil transport from Baku to Astrakhan. ● “Siemens and Halske” obtained the first oil concession in the Baku area.
1867	<ul style="list-style-type: none"> ● The Astrakhan naval port was closed and the main port and base of the Caspian Fleet was moved from Astrakhan to Baku. ● The Turkestan General Governorship was formed.
1868	The well-known eruption of the Pogorelaya Plita volcano, which resulted in the disappearance of the mud-volcanic island located on the sea road between Baku and Lenkoran that rose for 2 m above the sea level. This was accompanied by the exceptional fluctuation of the Caspian Sea level (nearly half a meter).
1869	<ul style="list-style-type: none"> ● As a result of merging of the Volga River Shipping Company “Merkurii” and the newly established Caspian Sea Shipping Company “Kavkaz,” Russia’s largest river and marine joint stock shipping company appeared. The Companies “Kavkaz” and “Merkurii” were patronized by the Tzar. ● Russian biologist A.O. Kovalevsky (1840–1901), a Member of the Russian Academy of Sciences, found and described about 20 species of invertebrate animals living in the Caspian Sea. ● A small military expedition from Baku under command of Colonel N.G. Stoletov landed in Krasnovodsk Bay on the eastern coast of the Caspian Sea and founded here the merchant trading post, Krasnovodsk (Taze-Shekher), presently named Turkmenbashi. ● The second volume (magnetic observations) of the report prepared by N.A. Ivashintsev was published.
1870	<ul style="list-style-type: none"> ● Construction of the artificial harbor and port in Petrovsk-Port City (Makhachkala) was completed. ● March of the Krasnovodsk detachment commanded by Colonel Markozov along the eastern coast of the Caspian Sea and into the Turkmen Steppe as far as Fort Kyzyl-Arvat.
1871	Tzar Alexander II gave permission to drill the first well in Baku. It was quoted: “Now we have our own Pennsylvania” (in 1859, oil was first discovered in Pennsylvania, USA).
1871–1872	The first wells were drilled on the Apsheron Peninsula. The well in Balakhany settlement produced 70 barrels of oil a day.
1872	<ul style="list-style-type: none"> ● Foreign entrepreneurs started buying oilfields on the Apsheron Peninsula. The Nobel Brothers and Rothschild Brothers began operation of some wells.

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- The oil company “G.Z. Tagiev” was established on the basis of the well belonging to oil producer P.A. Vermishev.
 - The *otkupnaya* system (personal purchase of oil-bearing parcels) was abolished and from that time on the oil lands were parcelled out under open bids on long-term (in fact, eternal) leases.
- 1873
- The largest oil gusher – “Vermishevsky” – blew on the Balakhany field. The oil well was gushing during 13 days. Within three months, it had produced over 90 million poods of oil. All surrounding terrains were covered with oil and even several oil lakes were formed.
 - Development and operation of the world’s largest (at that time) oilfield, on the Apsheron Peninsula near Balakhany, Sabunchi, Ramany, and Bibi-Eybat settlements, was started. The total oil reserves were evaluated at more than 500 million tons.
 - Robert Nobel arrived in Baku and invested 25 thou Rubles into the purchase of a small oil refinery.
 - The border between the Russian Empire and Persia was drawn along the Atrek River.
 - The Baku Oil Producers Society was created; it soon became an executive body in oil industry management on the Caspian and Caucasus.
 - The “Novorossiysk University Newsletters” published the work of F.K. Brun, “Peripl (pilot) of the Caspian Sea on Maps of the fourteenth century.”
- 1874
- Within the Caucasian Military District on the basis of the Mangyshlak and Krasnovodsk units was formed the Trans-Caspian Military Division with the center in Krasnovodsk subordinated to the viceroy on the Caucasus.
 - Construction of the Volga-Caspian Canal began.
 - V.A. Kokorev together with P.I. Gubonin (circa 1825–1894) on the basis of their first oil refining plant founded the Baku Oil Society.
 - Hydrographer N.L. Pushchin (1837–1891) published his work, “Magnetic Observation of the Caspian Sea,” for which the Russian Geographical Society awarded him the F.P. Litke Medal.
 - In Astrakhan, the historical regional Petrovsky Society of Investigators of the Astrakhan Area was created. It existed until 1917.
 - The first attempts to use oil (residual oil) as fuel for the ships of the Caspian Fleet.
- 1875
- World’s first lubrication oils were produced in Azerbaijan at a plant built by V.I. Ragozin near Balakhany.
 - A large oil gusher blew out on the oilfield of the “Souchastniki” Partnership from the depth of 945 m. The well spouted 150–200 thou poods of oil a day and in one month four large oil lakes appeared in Balakhany.
 - In Petersburg, the fundamental treatise of K.M. Baer and N.Ya. Danilevsky, “Fisheries in Russia,” was published in five volumes describing in detail the fishery regions of the Caspian Sea.
 - Academician B.A. Dorn, Director of the Asian Museum, published the book “Caspian: Travels of the Ancient Russians to Tabaristan with Additional Information about Their Other Raids on the Caspian Sea Coast” in Saint Petersburg.
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1876	Robert Nobel purchased from the Tifliss Partnership a small kerosene factory in Cherny Gorod near Baku for 25 thou Rubles.
1876–1877	<ul style="list-style-type: none"> ● The Aral-Caspian expedition headed by Russian zoologist Academician O.A. Grimm collected vast materials on the fauna of the Caspian Sea. ● The first nautical classes were opened in Astrakhan.
1877	<ul style="list-style-type: none"> ● N.L. Pushchin published the materials of the N.A. Ivashintsev expedition and also the revised and enlarged Caspian pilot, “Caspian Sea: Hydrographic Description and Sailing Guidelines.” ● The first lot of oil for lighting was delivered to Saint Petersburg from the Nobel factory. ● Ludvig Nobel made a report at the Russian Emperor’s Technical Society called “Outlook on the Baku Oil Industry and Its Perspectives.” ● The first oil tanker in the world – a refurbished metal ship called “Zoroastr” – was built in Sweden in Motala City by the Nobels. ● Oil producers A. Bunge and S. Palashkovsky started construction of the railroad Baku–Batumi. The Rothschilds provided credit for finalization of its construction. ● The small-draft cargo vessel “Tegeran” was built for communication with the shallow port Anzali in Persia. ● An oil pipeline was constructed from the Balakhany oilfield to the oil refinery.
1877–1878	US entrepreneur H. Tweedle suggested 4 projects on construction of the Caspian-Black Sea oil pipeline.
1878	<ul style="list-style-type: none"> ● The General Map of the Caspian Sea was published. It was prepared on the basis of astronomical observations, surveys, and measurements made in 1858 under command of Rear-Admiral Ivashintsev and in 1871–1874 under command of Captain-Lieutenant Pushchin. ● Construction of the oil pipeline Balakhany – Cherny Gorod (Baku region, 12 km long and 75 mm in diameter) was completed. The construction was supervised by talented engineer V.G. Shukhov, Member of the Russian Technical Society (RTS), later an Honorary Member of the USSR Academy of Sciences and Hero of Labor. ● Head of the trans-Caspian Military Division, Major-General N.P. Lomakin (1830–1902), founded a fortification in Chikishlyar, Turkestan. ● Russia creates the Persian Cossack of His Highness Shah Division, which devotedly served the Tsar until 1917. ● The oil tanker “Zoroastr,” via the Mariinsky and Volga River Systems, arrived in the Caspian.
1879	<ul style="list-style-type: none"> ● Swedish polar researcher Nils Otto Gustaf Nordenskjold (1832–1901) published in his Atlas a map of the Caspian Sea that was copied by Vitsen in 1665 in Moscow (the original map did not survive). ● Engineer M.A. Danilov spoke before the members of the Caucasian Branch of the Russian Technical Society “About the project on shipping and irrigation canals among the Caspian, Black, and Azov Seas by the results of completed investigations.” ● In Saint Petersburg, Tsar Alexander II founded “Oil Production Partnership of Nobel Brothers & Co” (“BroNobel”). In a resolution of the Special

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- Meeting on admission of foreigners to oilfield development in the Baku area, the tsarist government specially favored the investments of foreign capital into oil production.
- 1880
- Construction of the Trans-Caspian military railroad was started. Its first section from the eastern coast of the Caspian to Molla-Kara was built.
 - Captain 2nd Rank S.O. Makarov, later on the outstanding Russian naval commander, arrived on the Caspian. He commanded ships taking part in the Akhaltekinsky operation.
 - Partnership “BroNobel” opened its office in Astrakhan where a special representative was in charge of oil transportation from Baku up the Volga.
- 1881
- Ashkhabad, a Russian military fortification near the aul (small village) with the same name, was founded. Ashkhabad is the modern capital of Turkmenistan.
 - In Tehran, the Convention on Delineation of the Russian and Persian Holdings to the East of the Caspian Sea and on the Russian-Persian Border was signed. The Treaty provided the legal basis for communication between Russia and Persia via Central Asia.
 - The Trans-Caspian Region was formed on the basis of the Trans-Caspian Division of the Caucasian Military District comprising Akhaltekinsky, Krasnovodsky, and Mangyshlak uezd with the center in Ashkhabad.
 - Publishing of the newspaper “Kaspiy” began in Baku.
 - In Astrakhan, a mechanical plant with tanks for oil product storage was constructed, and the office of the Oil Production Partnership of Nobel Brothers was opened.
 - Nobel Corp. constructed two oil-carrying ships, “Kalmyk” and “Tatarin.”
 - M.A. Rykachev carried out 3D measurements of the elements of the Earth’s magnetic field in eight points on the coast of the Caspian Sea using materials and measurement results obtained by N.L. Pushchin in 1858. Also prepared the first magnetic maps of inflection, gradient, and strength of a magnetic field in the sea.
- 1882
- Continuous refinement of oil practiced at the Nobel Brothers plants.
 - *Beginning of a long period of drop in the Caspian Sea level.*
- 1883
- Construction of the trans-Caucasian railroad (Baku–Batumi) was completed, enabling oil transportation from Russia to the West.
 - In addition to the 1881 Convention, a secret treaty was signed that entitled Russia to bring troops on the Khorasan territory in case of a threat to security of the Trans-Caspian railroad.
 - 115 ships and 1,233 sailboats were registered in the Astrakhan port.
 - Well-known traveler and correspondent for the newspaper “Morning Post,” Charles Marvin visited Russia, the Caucasus, Baku, and the Caspian coast and was astonished by the scale of oil industry development in these regions. He described his impressions in the book, “Region of Eternal Fire: an Account of a Journey to the Petroleum Region of the Caspian.”
 - The Rothschilds founded the Caspian–Black Sea Company, the main exporter of petroleum products.
 - In Saint Petersburg, the Financial Oil Corporation “Nefit” was founded. It possessed oilfields, kerosene, and chemical plants in Baku and united the
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	<p>companies “Baku Oil,” “Neft,” “Balakhany-Zabratsky,” and others.</p> <ul style="list-style-type: none"> ● A.I. Glukhovsky published the book, “Passage of the Amydarya Waters along Its Old Channel to the Caspian Sea and Creation of a Continuous Waterway from the Afghanistan Border via Amudarya, Caspian, Volga, and Mariinsky System to Petersburg and Baltic Sea.” This described project was not implemented. ● In Moscow, the booklet entitled “Some notes about oil transport by oil marine and river ships invented first in 1873 by brothers Nikolay and Dmitry Artemievs in Astrakhan” was published.
1884	<ul style="list-style-type: none"> ● Tsar administration divided the territory populated by the Daghestan peoples among Daghestan and Tersky Regions, trans-Caucasian District, and part of Baku and Elizavetinsky Provinces. ● “Oil barons” in Baku established their own organization, the Oil Extractors Congress Council. Among its main objectives was to protect the interests of oil producers in governmental authorities, ensuring high profits for the oil barons, and control of workers’ movement. All in all, 36 congresses were held. Until 1888, the Council was headed by L. Nobel. ● Ichthyologist N.A. Borodin began artificial farming of stellate sturgeon in the Ural River. ● Secretary of London Petroleum Association Bowerton Redwood visited Baku. Afterwards, he addressed the meeting of the Chemical Industry Society with a comprehensive report on the situation in the petroleum industry in Russia. ● The first ship inventory on the Volga was conducted; as a result, a list of 665 ships was presented.
1885	<p>The British scientific journal “Engineering” published a large article analyzing the growth dynamics of the petroleum industry in Baku from 1864.</p>
1886	<ul style="list-style-type: none"> ● The Rothschilds established the Batumi Oil Refining and Trade Partnership that, together with the Nobel plants, accounted for 30% of the world petroleum production. ● Charles Marvin published a booklet entitled “Future Flow of Russian Oil.” ● British Company “John Russel & Co.” twice sent its representatives to the Caucasus; the 3rd Congress of the Baku Oil Producers was attended by Stewart, the representative of the London Chamber of Commerce, and Peacock, British Vice-Consul in Batumi.
1887	<ul style="list-style-type: none"> ● The Nobels started drilling for oil on Cheleken Island. ● The petroleum company “Caspian Partnership” was established in Baku. ● The petroleum company “Nagiev Mussa” was founded in Baku. ● A small library and the basis for a future ichthyologic museum were created at the Department for Fishing and Seal Hunting on the Caspian.
1888	<ul style="list-style-type: none"> ● Death of the “Baku Oil Baron” Ludwig Nobel on the French Riviera at the age of 57. ● Organization of the plant “Krasnye Barrikady” in Astrakhan.

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	<ul style="list-style-type: none"> ● Baku was visited by Tsar Alexander III and Maria Fedorovna. They were accepted at “BroNobel” and also visited the Nobel’s plant “Chernyi Gorod.” ● Russian entrepreneur S.M. Lionozov leased the Persian fishery waters for fisheries development in the Southern Caspian. The concession remained in effect until 1925. ● The ichthyologic museum was opened in Astrakhan at the Department for Fishing and Seal Hunting on the Caspian. ● The first large passenger vessel, “Emperor Alexander II,” was put afloat on the Caspian.
1889	<ul style="list-style-type: none"> ● Future “Talleyrand of petroleum diplomacy” Kalust Gulbenkian published some articles about Russian petroleum in France. ● Nobel Brothers completed construction of the 75 km long pipeline over the Caucasus Ridge. They used 4 t of Alfred Nobel’s dynamite. ● The Trans-Caucasian railroad, a part of which became the Baku–Sarukhany railroad, was constructed. ● The sanitary-bacteriological laboratory was opened at the Department for Fishing and Seal Hunting on the Caspian. It started regular fishery investigations in the Volga-Caspian region. This was the origin of the sea fishery station in Astrakhan.
1890	<ul style="list-style-type: none"> ● G.Z. Tagiev purchased the shipping company “Kaspiy,” refurbished it, and created a fleet of 10 ships. ● The work of N.M. Filippov “On Fluctuations of the Caspian Sea Level” was published, asserting that the main factor causing fluctuations of the water level in the Caspian was the volume of a runoff of the rivers, particularly the Volga, flowing into the sea. ● Russian geographer and geologist P.A. Chikhachev published his article “Aral-Caspian Depression” in France. It was translated into Russian in 1982. ● Marcus Samuel, founder of the Shell Transport and Trading Company (1897), visited Baku. ● James Vishau from Britain purchased the oilfield “S.M. Shibaev & Co.” in the Ramany Region. ● “General Regulations on Sea Pilots” was published. This was the most comprehensive legal act regulating pilots’ activities in Russia until 1917. These Regulations envisaged creation of six pilot districts, including the Caspian. The main organizational unit became the Pilots Society. Pilot activities on all seas of Russia were supervised by the Maritime Ministry.
1891	N.A. Borodin conducted successful experiments on artificial fertilization of sturgeons.
1892	Drilling of several exploratory wells by S.N. Nikitin in Dossor, Iskine, and Karachunbul proved the availability of deep oil reserves.
1892–1896	Strikes in tobacco factories and fishery enterprises in Baku.
1893	The Oil Company “Shamsi Asadullaev” was established in Baku.
1894	<ul style="list-style-type: none"> ● On the basis of the “Regulations on Fishery in the Ural Cossack Troops” the position of a troop fishing specialist was created for the first time in Russia.

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	<ul style="list-style-type: none"> ● Geologist N.I. Andrusov and sailing master Maksimovich went to the Kara-Bogaz-Gol Bay where they collected specimens of the bay's flora and fauna. ● A group of industrialists from Petersburg headed by Leman purchased the right to the earth's deposit development, established the Emba-Caspian Partnership, and started drilling numerous shallow wells.
1894–1895	Construction of the Krasnovodsk stretch of the Trans-Caspian railroad was completed.
1895	<ul style="list-style-type: none"> ● With the support of N.A. Borodin the winter fishing in the Ural River was prohibited and instead the fishing with brace nets was allowed because it did not damage the sturgeon youngsters. ● In Saint Petersburg the "Atlas of B.A. Dorn Journey over the Caucasus and Southern Coast of the Caspian Sea" was published. ● Professor N. Borodin led the expedition to the Northern Caspian on the war ship "Uralets." ● The strongest earthquake in the Krasnovodsk region with magnitude 7.9.
1896	<ul style="list-style-type: none"> ● Construction of the kerosene pipeline Baku–Batumi (883 km long and 200 mm in diameter, with a carrying capacity 1–1.5 million tons a year, at a cost of 21 million Rubles) was initiated. It was completed in 1906. ● A well producing 12 million poods of oil blew out for 15 days and the greater part of oil was discharged into the Caspian Sea. ● A sea port was constructed in Krasnovodsk. ● The Petroleum Company "Akhverdov I.A." was established in Baku. ● In Saint Petersburg, the Russian Petroleum Company was established. It owned oilfields in the Baku area and a kerosene plant in Baku. ● The Astrakhan sanitary-biological laboratory was officially given a status of the Ichthyological Institute. It existed until 1904.
1897	<ul style="list-style-type: none"> ● The expedition of I.B. Shpindler on the ship "Krasnovodsk" conducted hydrological observations at 126 casts on the Caspian. Mirabilite formations were discovered at the bottom of Kara-Bogaz-Gol Bay. ● Chemist A.A. Lebedintsev made a report at the 10th International Geological Congress in Petersburg about the mineral wealth of Kara-Bogaz-Gol. ● The Trans-Caspian Region was included into the Turkestan General-Governorship. ● The British purchased the G.Z. Tagiev oilfields and two and a half years later they received 7.5 million of net profit from its oil production.
1898	<ul style="list-style-type: none"> ● The railroad line Petrovsk-Port (Makhachkala)–Baku running through Daghestan began service. ● Creation of a post of the Russian Border Commissar in the settlement Gumbet-i-Kabus (Persia) 90 km to the northeast of Astrabad. ● The Rothschilds established the Trading and Transportation Company "Mazut," which had 13 oil tankers in its possession on the Caspian. ● The Council of Baku Petroleum Industrialists initiated publication of the Journal "Neftyanoy delo" (petroleum business). This was the first periodical in the Russian language on petroleum business in Russia (it existed until 1920).

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1899	<ul style="list-style-type: none"> ● “BroNobel” took on lease 5.5 ha of lands in Sabunchakh and built a new settlement called “Na gore” (on a mountain) there. ● One of the Gukasov brothers and Arshak Osipovich represented the Caspian Partnership (a petroleum company in Baku) in Europe. ● About 100 oil refineries were founded in Baku. ● A.I. Mantashev (1849–1911), an entrepreneur, merchant, and shareholder of the Nobel Brothers Partnership, founded the Petroleum Production and Trading Company “A.I. Mantashev and Co.” in Baku. ● The Baky-Derbent railroad line began operations. ● In Karachungul area near Guriev, well No. 7 produced an oil gusher from the depth of 42 m that blew out for 8 h. This was the beginning of oil production in Kazakhstan. ● In Baku, both the “Souchastniki” Partnership and Apsheron Petroleum Company were established. ● “Standard Oil” sent oil geologists to the Shemakha uezd in Azerbaijan, and they predicted availability of commercial oil reserves in the uezd lands. ● A special commission by Professor S.V. Shidlovsky was organized to study the effects of Volga oil pollution on humans and fish.
1899–1901	Azerbaijan became the world’s first oil producer (11.5 million tons a year). In the same period, the USA extracted only 1 million tons.
1900	<ul style="list-style-type: none"> ● <i>The level of the Caspian Sea was –25.64 m. A dropping tendency was maintained.</i> ● Engineers Lokhtin and Artemov proposed construction of a canal for sea and river vessels connecting the Azov Sea via the Manych Depression with the Caspian Sea. ● The Aral–Caspian Petroleum Company was established by Leman; the Emba Company of Stakhaev and Nobel was also established. ● Devastating fire on the Sabuchy oilfields on the Apsheron. The oilfields of Arshaupis, Nagiev, Nobel, Tumaev “Raduga,” Baku Petroleum Company, Russian Petroleum Company, Baku Petroleum Industrial Company, and “Rossiya” Company were damaged. The fire raged for five days and nights. About 96 thou t of mazut, 97 derricks, dwelling houses, 10 railway tanks, up to 500 poods of oil, boiler rooms, and machines were burnt out. ● Construction of 26 oil pipelines (total length 277 km) connecting the Balakhany industrial area with oil refineries in Baku was completed
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20th century	
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1901	<ul style="list-style-type: none"> ● Baku oil region provided 95% of the Russia’s petroleum output (50% of the world output). ● Russia’s major river and sea Joint Stock Shipping Company “Kavkaz and Merkurii” opened agencies in Persia: in Tehran, Mashhad, Rasht, and Qazvin. ● A.N. Derzhavin started experiments on sturgeon farming in the Kura River.

 20th century

- Mechanical rotary drilling was introduced into the oil production practice.
 - A decision was taken on backfilling of the Bibi-Eybat harbor near Baku.
 - Fishing in the open Caspian Sea waters has begun in Azerbaijan.
 - Huge fire on Apshehon petroleum deposits lasted five days. 96,000 t of oil has burned down.
- 1902
- High speed vessels “Skobelev” and “General Kuropatkin” were used for regular communication between Baku and Krasnovodsk.
 - Attempts to introduce flatfish glossa (*Platichthys flesus flesus*), gray millet (*Lisa auratus* and *L. saliens*) and mackerel (*Scomber scombrus*) into the Caspian failed.
 - Company “BroNobel” signed a contract on purchase of the oilfields in Ramany from oil producer Isabek Gadjinsky.
 - In Surakhany, the oilfield belonging to the Baku Petroleum Company (well No. 1) spouted a gas gusher from a depth of 204 m yielding 57 thou m³/day.
 - V.V. Bartold, a specialist on Oriental studies, published his work “On Inflow of the Amudarya into the Caspian Sea.”
 - German caviar company “Dieckmann & Hansen” opened an office in Astrakhan.
 - Attempts to introduce the flounder (*Platichthys flesus flesus*) into the Caspian Sea failed.
- 1903
- Spontaneous public actions of workers at the oilfields of Khatsov and Baku Petroleum Company escalated into a general strike in Baku. This was the first general strike in Trans-Caucasia.
 - Geologist D. Golubyatnikov began geological surveys in Azerbaijan.
 - The most destructive fire on the Bibi-Eybat oilfield burned at least 820 thou t of oil.
 - “Rules of Caspian-Volga fishing and Seal Hunting” were put into effect.
- 1904
- In Astrakhan, the Ichthyology Laboratory was organized at the Department for Caspian-Volga Fishing and Seal Hunting to study zooplankton and benthos in the Northern Caspian.
 - First observations of the Caspian Sea level along the Persian coast at Anzali.
 - Beginning of construction of the Anzali Port, the main trading port and naval base on the Caspian Sea in Persia. It was completed in 1913.
 - In London, the book of hereditary British engineer and geologist A. Beeby-Thompson, “The Oilfields of Russia and the Russian Petroleum Industry,” was published by C. Lockwood (London). A. Beeby-Thompson had worked for more than dozen years at one of the British factories in Baku. This book was a kind of encyclopedia on the oil industry in the Russian Empire. The second edition was published in 1908.
 - During a 2-week strike of the Baku workers about 225 oil derricks were burnt.
 - The first scientific-trade Caspian expedition headed by N.M. Knipovich.
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20th century	
1905	<ul style="list-style-type: none"> • The ichthyology laboratory in Astrakhan was assigned the expedition boat “Delta.” • Company “BroNobel” purchased oilfield parcels from industrialist A. Ya. Adamov. • On wellsites in Balakhany, Azerbaijan, compressors were used for the first time.
1906	<ul style="list-style-type: none"> • Uprising of the crews on the Caspian Fleet in Baku. • The kerosene pipeline Baku-Batumi (length 883 km, diameter of 200 mm, with 16 pump stations) began operations.
1907	<ul style="list-style-type: none"> • Signing of the Russian-British Convention on the Affairs of Persia, Afghanistan, and Tibet by Russian Foreign Minister A. Izvolsky and British Ambassador in Russia Sir Arthur Nicolson. According to this Convention, Persia was divided without its consent as follows: all Persian provinces located to the north of the “Qasr-i Shirin-Isfahan-Yazd-Khak line,” ending at the crossing point of the Russian, Afghan and Persian borders were to be controlled by Russia, while the provinces located to the south of this line went to Great Britain. This was the end of “Great Game”. • Petroleum Production Partnership “G.M. Lianozov & Sons,” one of the largest petroleum companies in Russia, was established. • Merging of two large companies Shell (USA) and Royal Dutch (the Netherlands) to form a single, transnational corporation “Royal Dutch Shell” headed by Henri Wilhelm August Deterding, who was called the “Oil Napoleon.” This corporation united the Caspian-Black Sea Company, “Kavkaz,” S.M. Shibaev, and “Souchastniki” companies. • Strike of 1,500 sailors of the Caspian oil fleet. • Destroyers “Pylkyi” and “Pronzitelny” came to the Caspian from the Baltic Sea.
1908	<ul style="list-style-type: none"> • Well-known Russian Arctic explorer G. Ya. Sedov worked in an expedition on the Caspian Sea. • On Cheleken, Turkestan, for the first time from a depth of 140 m, a petroleum fountain with a daily debit of 24.5 t was received.
1909	<ul style="list-style-type: none"> • Multi-purpose expedition for study of the wealth of the Kara-Bogaz-Gol Bay (I.P. Shpindler, N.S. Kurnakov, N.I. Andrusov, A.I. Lebedintsev, and N.I. Podkopaev). • Works on drainage of Bibi-Eybat Bay near Baku to prevent flooding of petroleum deposits by sea water began.
1910	<ul style="list-style-type: none"> • G.M. Krzhizhanovsky suggested an idea for the use of Volga power generating capacity. • A disastrous storm on the Caspian; approximately 2,500 thou people died. • Research steamer “Pochin” was built; for many decades, it was used for fishery research. • In Kara-Bogaz-Gol Bay, exploitation of coastal deposits of mirabilite (Glauber’s salt) began.

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1911	<ul style="list-style-type: none"> ● A strong earthquake with the epicenter in the Caspian Sea with magnitude 6.4. ● Russian and British troops were moved into Persia to suppress the revolt of tribes disagreeing with interference in the affairs of their country. ● Acetylene was chosen for fuel in lighthouses. In 1912, it was first used in Russia at the Narginsky lighthouse on the Caspian Sea. ● Hydrometeorological service of the Caspian Sea consisting of seven hydrometeorological stations and the central station in Petrovsk-Port (Makhachkala) was organised. ● Oil production began in Kazakhstan on Emba oilfield Dossor. ● For the first time, in Surakhany, Azerbaijan, rotary drilling was used. ● A joint-stock company, “Astrakhan Refrigerator,” was established; it was one of the largest firms providing storage and transportation of perishable food.
1912	<ul style="list-style-type: none"> ● L.S. Bagrov published the article, “Materials to the Historical Review of the Caspian Sea Maps,” in Saint Petersburg. ● In London, the Russian General Petroleum Corporation “Oil” was established. ● A Law Restricting the Ice Fishing on the Caspian Sea was adopted. ● The Nobel Brothers expanded the works on well drilling, construction of pipelines, and preparation of oil sumps on the Emba oilfields. ● In Baku, the Farming Department of the Chief Department of Land Management and Farming of the Russian Empire established the Trans-Caucasian Research Fishery Laboratory.
1912–1913	<ul style="list-style-type: none"> ● The Second scientific-trade Caspian expedition headed by N.M. Knipovich. ● Baku Ichthyology Laboratory was established.
1913	<ul style="list-style-type: none"> ● The first refrigerated ship started to serve fishing boats on the Caspian Sea.
1914	<ul style="list-style-type: none"> ● A strong storm swept over the Caspian. About 100 people died. ● Law prohibiting fishing with trotlines with bait was passed.
1914–1915	<ul style="list-style-type: none"> ● Scientific-trade Caspian expedition headed by N.M. Knipovich continued to work. A lot of material on hydrology of the Caspian Sea was collected.
1915	<ul style="list-style-type: none"> ● Russian-British secret treaty on revision of influential borders in Persia. ● A new fish farm was commissioned on the Kura River. ● The Commission on Study of Natural Production Capabilities in Russia (CSNPC) was created at the Petersburg Academy of Sciences. It was established to complete a systematic account of natural resources over the whole country. ● “BroNobel” controlled over half of the Russian oil industry. ● At an oil well in Ramany near Baku, Azerbaijan, deep pumps were used for the first time.
1916	<p>Russian citizen Akakiy Kostoria purchased concession to oil drilling in the northern provinces of Persia (right was revoked by Persia after the 1917 Revolution in Russia).</p>

20th century

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- 1917
- October Revolution in Russia.
 - In Paris, the secret British-French Convention was concluded under which Russia was divided into “zones of action.” The British zone covered the Don, the Caucasus, and Turkestan.
 - The separate Caspian Sea survey unit was renamed the Hydrographic Team of the Caspian Sea.
 - *Drop of the Caspian Sea level began from –25.82 m.*
- 1918
- Russia was declared the Soviet Federative Socialist Republic. The RSFSR Constitution was adopted.
 - Establishment of Soviet power in Astrakhan.
 - Complete nationalization of fisheries in the Astrakhan region.
 - The Astrakhan Fleet was transformed into the Astrakhan-Caspian Navy.
 - The Trans-Caucasian Democratic Federative Republic (TDFR) was established. It comprised Georgia, Armenia, and Azerbaijan. It existed from April 22 to May 26.
 - The Azerbaijan Democratic Republic was formed (28 May 1918 – 28 April 1920).
 - The Committee for Kara-Bogaz-Gol Studies headed by Academician N.S. Kurnakov was created at the Supreme Council of National Economy (VSNKh).
 - In April, military actions on the Caspian began. The revolutionary defense committee of Baku ordered the Caspian Navy to transfer the expedition unit to Petrovsk-Port (Makhachkala) and other points in Daghestan.
 - Occupation of Baku by British troops under command of General V. Thompson. Russian troops commanded by General L. Bicherakhov also took part in this operation.
 - Execution of the leaders of the Azerbaijan workers’ movement known to history as the 26 Baku commissars.
 - British troops that had been moved from Anzali, Persia (a regiment of the 39th infantry brigade) controlled Krasnovodsk; it was the only non-freezing port and the terminal of the Central Asian Railroad.
 - The British Caspian Navy was formed from captured merchant ships.
 - The Turkestan Autonomous Soviet Socialist Republic was formed as part of RSFSR (it included the Trans-Caspian Region covering the greater part of the Turkmenistan territory).
 - Regional Council of People’s Commissars (Sovnarkom) of Turkestan passed a resolution on nationalization of Turkmenistan oilfields, but these plans were realized only in late 1919 after invaders had been forced out.
 - Nationalization of the oil industry in Russia.
 - The Volga Navy with the base in Nizhny Novgorod was created.
 - Committee on study of Kara-Bogaz-Gol Bay headed by Academician N.S. Kurnakov was established under VSNKh.
- 1919
- The British Navy ensured permanent communication among the British troops deployed in Baku, Petrovsk-Port, on Chechen Island, in Fort Aleksandrovsk, and in Krasnovodsk.
 - British troops left Baku.
 - Evacuation of British troops from Krasnovodsk.
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 20th century

- In the Kremlin, the idea for construction of a railroad and oil pipeline from the Emba oilfields via the Ural River and Aleksandr-Gai to Saratov, the so-called “Algemba” Project, was proposed.
 - The Astrakhan Nature Reserve became the first established in the USSR.
- 1920
- Sea forces of the Caspian Fleet were created.
 - The Labor and Defense Council assigned a very important task to the Caspian Fleet, the transport of oil from Baku to Astrakhan.
 - Troops commanded by M. Frunze occupied Krasnovodsk, one of the major Caspian ports, as well as the Dossor and Makat oilfields.
 - The GOELRO Plan on electrification of Russia was elaborated and approved.
 - The Kalmyk Autonomous Area was formed as part of the RSFSR.
 - The Azerbaijan Soviet Socialist Republic was proclaimed.
 - The Anzali operation. The Soviet Volga-Caspian Navy and the Red Fleet of Soviet Azerbaijan forced invaders out from the coast of the Caspian Sea and took back from the Persian port of Anzali ships that had been captured.
 - Publication of the journal “Azerbaijan Oil Industry” began.
 - Nationalization of the oil industry of Azerbaijan. The Azerbaijan Petroleum Committee liquidated 272 private oil companies operating in the Baku Region.
 - U.S. Company “Standard Oil of New Jersey” purchased the rights to 50% of the Nobel-owned oilfields in Russia for US\$ 6.5 million up front and a subsequent payment of US\$ 7.5 million.
 - To support RSFSR political influence on the littoral regions of Iran, destroyers and gunboats of the Caspian Navy were permanently deployed to Port Anzali.
 - The German company “Dieckmann & Hansen” and the French Company “Petrossian” received permission from the Soviet Government to deliver and sell Soviet sturgeon caviar in Germany and France. Later, the U.S.A. was added.
 - “Ubekokaspiy” was established. July 9 became the founding date of the Soviet Hydrographic Service of the Caspian Military Fleet.
 - The Azerbaijan Polytechnical Institute became the first in either Europe or Asia centered on the education of engineers in oil industry.
- 1920–1941
- A set of expeditions were conducted on the Caspian Sea (Astrakhan roads, Kura River mouth, near the Apsheron Peninsula, nearby Pahlavi (Anzali), opposite Kara-Bogaz-Gol, western coast from Baku to the border near Astara, and on the eastern coast from the border to Krasnovodsk Bay).
- 1921
- On February 26 in Moscow, the Treaty between the Russian Soviet Federative Socialist Republic and Persia was signed. It stated the principles of equality as the basis for bilateral relationships between the two countries. All Persian debts before Russia were annulled. Russia declared null and void all previously concluded treaties. The Caspian became the Russian-Persian (Iranian) sea. Both states agreed to adopt the border outlined by the Division Commission in 1881. On behalf of RSFSR, the treaty was signed by Georgy Checherin and Lev Karakhan; on behalf of Persia, it was signed by Meshaver-al-Memalek.
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 20th century

- The Trans-Caspian Region was renamed the Turkmen Region.
 - The first volume of the “Proceedings of the Caspian expedition, 1914–1915” and the monograph of N.M. Knipovich, “Hydrological studies on the Caspian Sea in 1914–1915,” were published.
 - Publication of the book by N.M. Knipovich, “The Caspian Sea and its crafts,” in the series, “Studies of Nature and Crafts of the Russian Seas”.
 - Scientific expedition headed by N.S. Kurnakov was sent to Kara Bogaz Gol Bay. It made a number of studies in hydrology, meteorology, and hydrochemistry to assess possible sodium sulphate production on the bay.
- 1922
- The Trans-Caucasian Soviet Federative Socialist Republic (TSFSR) was formed on December 13 comprising Azerbaijan SSR, Armenian SSR and Georgian SSR.
 - Formation of the USSR on December 30.
 - In Baku, the first contract on oil drilling with private contractors (the Rozanov Brothers) was concluded.
 - The Peoples Land Management Commissariat approved a 10-year plan to fix sands in the Astrakhan area.
 - The State Caspian Shipping Company was established.
 - The Nobel Brothers founded the Trading-Industrial Partnership “Iran.” The assets of the Partnership included warehouses, oil pipelines in Northern Persia, and three vessels under construction in Sweden for oil transportation along rivers.
 - The Naval Observatory at “Ubekokaspiy” prepared the first experimental weather forecast for the Caspian Sea.
 - Department of safety navigation in the Caspian Sea established the Baku Sea Observatory.
- 1923
- S.M. Kirov initiated works on backfilling Ilyich Bay, located in the western part of Baku Bay.
 - Well No. 61 in the Bibi-Eybat Bay produced an oil gusher.
 - The Caspian Hydrographic Team was formed. It began its activities on the western coast, the Astrakhan sea roads, and later on in Baku Bay, on the Apsheron Peninsula, near Lenkoran-Astara, in the Cheleken-Ogurchinsky Strait, and in the Kara-Bogaz-Gol Bay.
- 1924
- Formation of the Turkmen SSR (27 October 1924) and its entrance into the USSR (by resolution of the 3rd Congress of the USSR Soviets, 20 May 1925).
 - The Volga-Caspian State Fishery Trust was established on the basis of the Chief Fishery Committee.
 - Port Ilyich was constructed in the bay named after Kirov (presently Kyzylagach) in place of the former jetty Prival. Prior to 1940 it was a very important point for cargo transportation.
 - First oil is produced by Well No. 74 on the Caspian Sea shelf, drilled from a wooden platform constructed in the Bibi-Eybat Bay. This laid the foundation for offshore oil production.
 - Experiments on artificial breeding of kutum in the Kumbashinka River in Azerbaijan and at the Samur fish farm in Daghestan.
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 20th century

- Political Bureau of CPSU CC passed a historical decision “On National Demarcation of the Republics of Central Asia.”
 - Outstanding specialist on Oriental study V.V. Bartold delivered 20 lectures in Baku at the Oriental Faculty of the Azerbaijan University. Many of the lectures focused on the Caspian. They played a significant role in shaping Oriental Science.
 - Strong autumn storm on the Caspian killed 10 people.
 - Investigations of wind currents on the Caspian Sea were initiated by N.N. Struisky. They were completed in 1930.
 - L.S. Berg published his work, “Caspian Sea Levels in Retrospect.”
 - First seasonal (February, May, August, and November) hydrological surveys on standard sections (Baku-Krasnovodsk-Ashurade-Astara-Baku) of the Caspian Sea completed; thus, obligations to the International Council for Studying the Seas were renewed.
 - Experiments on artificial production of kutum on the Kumbashinka River in Azerbaijan and at the Samur piscicultural station in Dagestan began.
 - Industrial production of sodium sulphate from many sites along the Kara Bogaz Gol Bay coast began.
 - The first petroleum pumped from the Caspian Sea shelf in Bibi-Eybat Bay is received.
- 1925
- *Beginning of the Caspian Sea level rise from –26.26 m.*
 - Political coup in Persia brought Reza Shah Pahlavi to power.
 - In the Caspian Shipping Company in Baku, a special Bureau for studying the currents of the Caspian Sea is created under guidance of N.N. Struisky. It existed until 1929.
 - Catastrophic frosts (-25°C) in the Lenkoran Lowland of Azerbaijan. Kirov Bay (presently Kyzylagach Bay) froze. Deaths of many waterfowl (flamingos died in the thousands).
 - Experiments began on mastering extraction of undersea petroleum deposits in the Caspian Sea. Under the initiative of S. Kirov, a sea well was erected on an artificial island in Ilyich Bay.
 - Beginning of commercial trade of Caspian sprat.
- 1926
- The USSR-Persia Treaty on Mutual Management of Border Rivers and Waters was signed.
 - The USSR and Iran arranged to conduct multi-purpose hydrographic investigations on the Iranian coast of the Caspian Sea under guidance of N.N. Struisky and using the vessel “M. Gorky.” Based on the results, the Hydrographic Department in 1929 prepared three navigation maps of the Iranian coast (from Astara to Gassan-Kuli) at scale 1:200,000, four layouts at scale 1:50,000, and supplements to the pilot. They also collected hydrological and hydrobiological data on the southern part of the sea.
 - Maximum twentieth century runoff of the Volga River ($390.6 \text{ km}^3/\text{year}$).
- 1927
- The USSR-Persian Treaty on Guarantees and Neutrality that confirmed the inviolability of the Soviet-Persian Treaty of 1921.
 - In the Note to Persia concerning Pahlavi Port, the Soviet Government proposed regarding the Caspian Sea as exclusively the right of the Soviets and the Persians (Iranians).
 - Completion of works on drainage of Bibi-Eybat Bay near Baku.
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20th century

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- The Persian Government, under Art. 14 of the 1921 Treaty, delivered to Russia a concession for fishing and fish processing on its shores and in the mouth of the Safid Rud, Babol, and Gorgan Rivers in the Southern Caspian.
 - The first Soviet-Persian (Iranian) Company, “SHILAT,” was founded. It existed until 1953.
 - Unprecedented autumn storm on the Caspian resulted in enormous material damage and killed 7 people.
 - Daghestan Research Fishery Station was established.
 - Krasnovodsk Research Fishery Station was established.
 - A network of 16 hydrometeorological stations of the Hydrographic Department was created on the Caspian Sea. From 1924 to 1949, V.N. Kolychev was in charge of operation of this network. The base of the triangulation network went from the Apsheron Peninsula to Makhachkala. The minaret of the Khan palace in Baku was defined once again as a basic astronomical point.
 - The Ichthyology Laboratory was transformed into the Astrakhan Research Fishery Station.
- 1928
- The Association of Caspian Fishery Stations, comprising Daghestan, Turkem, Azerbaijan, and Astrakhan stations, was created. In 1931, the Guriev Fishery Research Station joined this association.
 - The “Special Act” was concluded between Russia and Persia.
 - V.V. Borisov applied the method of water leveling of depth gauges on the Caspian Sea for the first time. He estimated the absolute “zero” levels for water gauging stations and related benchmarks.
 - VSNKh of the USSR accepted the decision about increasing the drilling investigation on Cheleken, the results of which confirmed the forecast of Academician I.M. Gubkin about the presence of petroleum stocks in Turkmenistan.
- 1929
- *The level of the Caspian Sea was -25.92 m.*
 - The main oil pipeline Baku–Batumi (the second line) – 882 km long, 273 mm in diameter, 13 pumping plants – began operation.
 - Kyzylagach Reserve (in the Kyzylagach Bay of the Caspian Sea, Azerbaijan) was founded to protect wintering aquatic and semi-aquatic birds.
 - The “Karabogazsulfat” Trust, conducting industrial manufacturing, including production and processing of Glauber’s salt and natrium sulphate from surface brines of the Kara Bogaz Gol Bay, was organized.
- 1930
- *Beginning of a long period of Caspian Sea level dropping.*
 - The Volga-Caspian Research Fishery Station (formerly, the Astrakhan Research Fishery Station) developed a form of “stock fishing” and practiced the industrial exploration of fish.
 - On the basis of CNPC and the Commission on Expeditionary Research of the USSR Academy of Sciences, the Council on the Study of Natural Production Capabilities of the USSR was established.
 - On the basis of the State Oceanographic Institute, a special laboratory to research the Caspian bottom was created.
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20th century	
	<ul style="list-style-type: none"> • Department of United Hydrometeorological Service of Azerbaijan SSR and the Caspian Sea was established. • Fishery studies of the Caspian herring expedition. • Introduction of Black Sea mullets (<i>Mugil auratus</i> Risso and <i>M. saliens</i> Risso) in the Caspian Sea. • Microscopic plankton algae <i>Rhizosolenia</i> penetrated into the Caspian Sea. From 1934 to 1936, it received such mass development that no other representative of Caspian aboriginal phytoplankton flora could be compared with it.
1930–1931	<ul style="list-style-type: none"> • Failure of attempts to introduce flatfish (<i>Psetta maotica</i>) in the Caspian. • Failure to introduce kalkan flounder (<i>Psetta maotica</i>) in the Caspian Sea in 1931.
1930–1932	All-Caspian Research Fishery Expedition (operated until 1934).
1931	<ul style="list-style-type: none"> • Treaty signed in Tehran between the USSR and Persia on Settlement, Trade, and Navigation. It stipulated that only USSR and Persian ships could sail over the Caspian Sea. • Novel of Aleksey Tolstoy about Baku petroleum industrialists, “Black Gold,” was published. It was later renamed “Emigrants.”
1931–1933	Two wooden platforms were constructed in the Bibi-Eybat Bay for drilling deep wells.
1932	<ul style="list-style-type: none"> • Publication of the novella “Kara-Bugaz” of K.G. Paustovsky. • Disastrous eruption of the volcano on Sangi-Mugan (Svinoy) Island in the Caspian Sea. Due to unexpected release of gas and its inflammation, the whole island with its structures and people was destroyed.
1932–1934	<ul style="list-style-type: none"> • Unsuccessful attempt of khamisa anchovy (<i>Engraulis engraulis</i>) and sultanka (<i>Mullus barbatus</i>) introduction into the Caspian Sea in 1934.
1933	<ul style="list-style-type: none"> • <i>The Caspian Sea level is –26.14 m.</i> • Initiation of construction of port Nowshahr (Iran) in the mouth of the Nowshahr River. It was completed in 1940. • Session of the USSR Academy of Sciences specially devoted to the problems of the Volga-Caspian. Development of a system to direct a partial transfer of northern rivers runoff into the Volga Basin and the Caspian Sea was recognized as necessary. Volume of transfer was determined as 50 km³. • Gassan-Kuli Nature Reserve in Turkmenian SSR was established to protect and study wintering places of aquatic and semi-aquatic birds. It included all shoals of the Southeastern Caspian.
1934	<ul style="list-style-type: none"> • The USSR National Internal Affairs Committee ordered that the unilaterally established line at Astara–Gassan-Kuli (423.2 km long) over the Caspian Sea (as an internal administrative action) be controlled by frontier guards. Iranian ships could not cross this line without permission. The air space of the Soviet Union was guarded along the same line. • The first research sledge expedition headed by N.N. Gorsky studied ice drifting in the Northern Caspian.

20th century

- For expansion of oil surveys and prospecting, the construction of the Caspian's first offshore metal platform for drilling by a new method (sinking of cemented tubular piles) began near Artyom (Pirallahi) Island, Azerbaijan SSR.
 - A method of offshore well drilling from longboats was practiced on the Caspian.
 - Beginning of seine boats and drifters use for fishing.
 - An integrated oceanographic survey of the whole Caspian Sea was conducted under supervision of S.V. Bruevich.
 - Commission for complex study of the Caspian Sea was established under the USSR Academy of Sciences (CASP). Its task was co-ordination of all works carried out by academic institutions on studying the Caspian Sea and consulting other organisations on these problems. The commission was headed by N. M. Knipovich
 - XVII Congress of VKP(B) – “Congress of the winners”. Approval of the Second five year plan. After that there was an idea of Academician I.G. Alexandrov to isolate Kara-Bogaz-Gol and Komsomolets bays from the Caspian Sea.
 - Fishing for mullet in the Caspian sea was allowed, as it had industrial importance.
 - On Artyom Island, Azerbaijan, sectional drilling, at which some wells are holed from one platform, was carried out for the first time.
- 1935
- Trading and Navigation Treaty between USSR and Iran.
 - Kalmyk Autonomous Area was transformed into the Kalmyk ASSR.
 - Resolution of the USSR Council of Peoples' Commissars “On regulation of fishery and protection of fish resources.” The Caspian Sea within the USSR borders was referred to the fishery bodies of the Soviet Union. In reality, fishing for Iranian ships was prohibited beyond the Astarā–Gassan-Kuli line.
 - Near Artyom Island, the first offshore well (775 m deep) producing oil was drilled.
 - V.V. Fedynsky made first measurements of gravitation onboard a tanker in the Caspian Sea. After this time, overwater gravity measurements were actively applied in the USSR.
 - I.M. Gubkin promoted an idea for investigation of petroleum on the sea.
 - In the area near Artyom Island, Azerbaijan, the first on the Caspian Sea offshore foundation was built.
 - Development of large petroleum deposit Izberbash (Daghestan) began.
 - Beginning of the State Hydrological Institute works under supervision of B.D. Zaikov to study the dynamics of the Caspian Sea level.
 - Minimal twentieth century runoff of Volga – 149.6 km³/year.
- 1935–1936
- In the northwest of Artyom (Pirallahi) Island, offshore platforms were constructed for the first time.
- 1936
- Azerbaijan became a Union Republic in the USSR.
 - Kazakhstan became a Union Republic in the USSR.
 - At the Astrakhan shipyard, the construction of motor boats began.
 - Travel of Turkmen fishermen on *taimuns* (local boats) from Krasnovodsk to Moscow.

 20th century

- Stationary nets were used for fishing in the Northern Caspian.
 - By resolution of the USSR Government, “Kara-Bugaz” Bay in the Turkmen SSR was given the name “Kara-Bogaz-Gol” Bay.

- 1937
 - Development of the offshore part of Artyom (Pirallahi) oilfield began.
 - The Karabogaz Division organized at the Commission on Integrated Study of the Caspian Sea of the USSR Academy of Sciences guided the works conducted in the bay.
 - An experimental soda plant using sodium sulfate and local limestones was constructed in Kara-Bogaz-Gol Bay.

- 1938
 - Engineer N.S. Timofeev presented a project of an individual metal platform. After preparation of the equipment, exploratory drilling began in the north of Pirallahi Island.
 - A new method of hypophysis injections of sturgeons was elaborated in St. Petersburg University by Prof. N.L. Gerbilsky. This method enabled mass reproduction of sturgeons in fish farms.

- 1939
 - XVIII Congress of VKP(B). Approval of the Third five year plan (1938–1942). The problem of the causes of the Caspian Sea level fluctuations received special importance. XVIII Congress decided: “In the third five years, a plan of complex reconstruction of the rivers Volga, Don, and Dnieper to prepare measures to maintain the Caspian Sea level and to begin constructing Volga-Don connection is to be developed”.
 - Beginning of extensive experimental research under the guidance of Prof. L.A. Zenkevich to study acclimatization of the Azov and Black Sea fauna; the group of species for resettlement from the Azov Sea into the Caspian was planned; among them, in the first place (61,000 individuals), was polychaete worm (*Nereis diversicolor* Muller), a perfect forage for sturgeons and other fishes. *N. Succinea* was planned for casual introduction.

- 1940
 - USSR-Iranian Treaty on Trade and Navigation of March 25 stated that all aspects of utilization of the sea and its resources are in the exclusive jurisdiction of the littoral states.
 - Artyom Island was connected with the mainland by a dam constructed in the narrowest part of the former Apsheon Strait (2 km long and 10 m wide).
 - L.S. Berg published his work, “First Russian Maps of the Caspian Sea (in Connection with Its Level in the Seventeenth and Eighteenth Centuries).”

- 1941
 - Beginning of World War II on the USSR territory.
 - *The level of the Caspian Sea was –27.88 m.*
 - Soviet Government passed a resolution on construction of the railroad Astrakhan–Kizlyar.
 - The expedition on the vessel “Geolog” (geologist) led by G.A. Gamburtsev conducted the first seismic surveys of oil and gas deposits in the Caspian Sea.
 - Azerbaijan extracted 23.5 mln t of oil, a record for the oil-extracting industry in USSR.

20th century	
1942	<ul style="list-style-type: none"> ● A. Hitler, in his plan “Felmi,” fixed the date of Baku seizure, September 25. ● The British-Soviet-Iranian Treaty was signed under which the USSR and Britain undertook to respect the territorial integrity of Iran, to protect it from German aggression, to base on the territory of Iran troops, naval, and air forces and to withdraw within 6 months of the end of military operations. ● Radical refurbishment of the port facilities in Krasnovodsk by relocation here of equipment from various sea and river ports. ● Transfer over the Caspian Sea from Krasnovodsk to Pahlavi (Iran) of Polish military units for participation in military operations on the African front against fascist Germany. ● M.V. Frunze Higher Naval College along with the Hydrographic Division was moved from Leningrad to Astrakhan (1941–1942), then to Baku. ● In Berlin, a handbook on the Caspian Sea for German submariners was published (Handbuch für das Kaspische Meer 1942, Berlin, 1942, Oberkommando der Kriegsmarine).
1942–1944	Participation of hydrographic surveyors of the Volga and Caspian Navy in the navigation and hydrographic support of military actions of the ships of the Volga Navy and sailing of transport ships (Stalingrad and Ulianov regions of the Volga Navy Hydrographic Service and Astrakhan region of the Caspian Navy Hydrographic Service).
1943	<ul style="list-style-type: none"> ● Formation of the Astrakhan Region. ● Tehran Conference of the Big Three: I.V. Stalin (USSR), W. Churchill (Great Britain), and F. Roosevelt (USA), who discussed the military issues and post-war arrangement of the world. ● First development of the Makhachkala Petroleum Deposit, Daghestan. ● Opening of oil refinery in Krasnovodsk, Turkmenistan, on the basis of evacuated Tuapse factory equipment.
1944	<ul style="list-style-type: none"> ● An all-Union competition was declared for the best technical design of offshore drilling platforms. ● The oil expedition from Azerbaijan with the help of the seismic prospecting method in the sea discovered oil reserves at various sea depths.
1945	<ul style="list-style-type: none"> ● End of World War II. ● For heroism during WWII, the Caspian Fleet was awarded the Red Banner Order. ● <i>The level of the Caspian Sea dropped from 1930 by 1.75 m (the data from different sources varied from 1.68 to 1.90 m) and was –27.96 m.</i>
1946	<ul style="list-style-type: none"> ● Soviet troops were withdrawn in full from the territory of Iran. ● The USSR Council of Ministers passed a resolution “On further development of the oil industry in Turkmen SSR.” ● By instructions of USSR government, B.D. Zaikov carried out fundamental studies (begun in 1937) of the causes of drop in the Caspian Sea levels (by 1.75 m) from 1930 to 1945. ● The first oil pipeline in Turkmenia Kumdag-Vyshka (length 40 km) began operation.

20th century	
1947	<ul style="list-style-type: none"> ● For development of offshore oilfields in Azerbaijan, the pier drilling methods were applied. ● Oilfield “Neftyaneye Kamni” was discovered on the Caspian Sea in Azerbaijan.
1948	<ul style="list-style-type: none"> ● Drilling of well No. 1 in the Neftyaneye Kamni (oily stones) oilfield began. ● From 1945, following the special resolution of the USSR Government, hydrographic surveys were conducted on Neftyaneye Kamni and in nearby areas of the Caspian Sea. ● Decision of the Council of Ministers of the USSR and CC VKP(B) “About the plan of shelterbelt forests, introduction of grassland crop rotations, and construction of ponds and reservoirs for maintenance of high and steady crops in steppe and forest-steppe areas of the European part USSR.” It was named “Stalin’s plan of nature transformation.” ● Decision of the Council of Ministers of the USSR “About measures to intensify investigations of petroleum deposits in the Turkmenian SSR.” ● The Volga-Caspian Research Fishery Station was transformed into the Caspian Branch of the All-Union Research Institute for Fishery and Oceanography.
1949	<ul style="list-style-type: none"> ● <i>Dropping of the Caspian Sea level resumed from –27.79 m.</i> ● The USSR Council of Ministers passed the resolution “On actions to improve organization of prospecting and operation of offshore oilfields in the Azerbaijan SSR.” ● In Baku, the Research and Design Institute “Mornefteproject” was established. ● In Baku, the Association “Azmoreft” was established. It was engaged in oil prospecting and production and construction of facilities for offshore oil production. ● In Moscow, the Chief Department “Glavmoreft,” headed by S. Ordzhonikidze, the Deputy Minister for the Oil Industry, was established. ● In Baku, the Caspian Marine Geophysical Expedition was created. It was the first marine geophysical organization in Russia, and was later renamed the Research Marine Geophysical Expedition (RMGE). In 1960, it was transferred to the Black Sea. ● The first oil from the shelf deposit “Neftyaneye Kamni” on the Caspian Sea was received. First readout of the history of sea petroleum production in the Azerbaijan Republic.
1951	<ul style="list-style-type: none"> ● Geographer E.A. Knyazhetskaya found in the library of the USSR Academy of Sciences the map of the Caspian Sea prepared by A. Bekovich-Cherkassky (1715) that was thought lost. This enabled scientists to restore Bekovich-Cherkassky’s position in many geographical discoveries on the Caspian, including his being the first to have visited Kara-Bogaz-Gol Bay.
1952	<ul style="list-style-type: none"> ● Artyom Island was connected with Baku by an electrified railroad running over the constructed embankment. ● A hydrometeorological station was opened on Neftyaneye Kamni. ● Opening of the Volga-Don navigable canal in the name of V.I. Lenin (length 101 km, 9 sluices to elevate ships to 88 m and 4 sluices to move down ships to 44 m).

 20th century

- The most powerful surge ever recorded on the Caspian Sea occurred November 11. As a result, in some coastal cities water rose by 4.5 m, and between the mouths of the Volga and Ural Rivers, the sea surged onto the land for 30 km.
- 1953
 - In Baku, the Department of the Caspian Oil Fleet was established.
 - The Oceanic tables for the Caspian Sea were published by Hydrographic Department of the USSR Navy.
- 1954
 - The USSR-Iranian Treaty on settlement of border and financial issues was signed. It identified the whole Soviet-Iranian border from the crossing point of the USSR and Turkey borders to the crossing point of the USSR, Iranian, and Afghanistan borders.
 - The Ust-Kura sturgeon rearing farm was put into operation in Azerbaijan.
 - The Ministry of the Petroleum Industry of the Azerbaijan SSR was formed.
 - The Caspian Branch of VNIRO was transformed into the independent Caspian Research Institute for Fishery and Oceanography (CaspNIRO).
- 1955
 - *The lowest level of the Caspian Sea (–28.43 m) in the recent 200 years.*
 - The Kizansky sturgeon rearing farm in the Volga Delta was commissioned.
 - The personnel of “Sevkasprybvod” directed a letter to First Secretary of CPSU CC, N.S. Khrushchev, proposing a complete ban of net fishing in the Northern Caspian.
- 1956
 - On the Caspian coast near Cheleken Island, oil-gas deposits in Koturdepe were discovered and put into operation in 1959. For this discovery, the geologists and drilling men were conferred the Lenin Award in 1962.
- 1957
 - Commissioning of the Volga (Kuibyshev) HEP named after V.I. Lenin near Zhigulevsk City. On July 1, 2004 it was renamed to Zhigulevsk HEP.
 - Restoration of the Kalmyk Autonomous Area (from 1958, the Kalmyk ASSR).
 - Azerbaijani oilmen dead in a storm on the Caspian near Neftyanje Kamni.
 - A canal was constructed through the Krasnovodsk Spit that shortened the distance for ships into Krasnovodsk Port, Turkmen SSR.
 - The Treaty on the Soviet-Iranian Border Regime and Settlement of Border Conflicts and Incidents was signed.
 - The Nature Conservation Section of the Moscow House of Scientists of the USSR Academy of Sciences convened the first meeting on the Caspian problems. It discussed the condition of four state nature reserves damaged as a result of the Caspian Sea level recess. A special wider conference on the Caspian problems in connection with the sea level drop was to be convened.
 - The Soviet ship “Ashgabad” ran aground on the Caspian. 270 people died.
- 1958
 - The Council of Ministers of the Azerbaijan SSR declared a competition on construction of offshore platforms for prospecting and operating works at a depth of 25–100 m.
 - Investigation of currents started in production and perspective oil- and gas-bearing areas with the help of current meters on special sections and anchored buoy stations.

20th century	
	<ul style="list-style-type: none"> ● For systematization and coordination of research on the Caspian Sea, nine standard hydrological sections were marked from which yearly hydrometeorological observations were later conducted during the main seasons of a year. The nine sections were: Chechen Island – Mangyshlak Peninsula, Makhachkala – Sagyndyk Cape, Derbent – Peschanny Cape, Divichi – Kenderli, Kilyazin Spit – Begdash, Zhiloy Island – Kuuli Cape, Kamen Ignatiya Island – Cheleken Island, Kurinsky Kamen Island – Ogurchinsky Island, Lenkoran – Belyi Bugor, and three supplementary sections in the Northern Caspian: Novinsky Islands – Kulaly Island, Tyuleny Island – Kulaly Island, Novinsky Islands – Burunchuk Cape.
1958–1960	The years of initial accumulation of water in the Volgograd Reservoir.
1959	<ul style="list-style-type: none"> ● Commission on Integrated Study of the Caspian Sea at the USSR Academy of Sciences was transferred to the Academy of Sciences of the Azerbaijan SSR. ● The Aeroclimatological Institute prepared the Hydrometeorological Atlas of the Caspian and Aral seas. ● Discovery of Okarem petroleum and gas deposits, Turkmenia.
1960	<ul style="list-style-type: none"> ● The Nature Conservation Section of the Moscow House of Scientists of the USSR Academy of Sciences, the USSR AS Council on Water Management, and the Caspian Commission and Institute of Geography of Azerbaijan AS convened a meeting on problems in the Caspian. ● In Leningrad, the work of F.D. Mordukhai-Boltovskoi, “Caspian Fauna in the Azov–Black Sea Basin,” was published.
1961	<ul style="list-style-type: none"> ● The first shop on rearing white salmon was put into operation at the Kizansky sturgeon rearing farm in Astrakhan Region. ● Hydrometeorological Service of the USSR accepted the decision to track the characteristics of the Caspian Sea level when it exceeded a uniform level, which for the Caspian equals –28 m (average weighted sea level for Pleistocene time) relative to the zero Kronstadt tide-gauge (“The Baltic System of Heights,” 1950).
1962	<ul style="list-style-type: none"> ● <i>The lowest level of the Caspian Sea (–28.53 m) since sea depth measurements first began in 1837.</i> ● Commissioning of the ferry line over the Caspian Sea from Krasnovodsk to Baku. ● Attempts to introduce autumn dog salmon (<i>Oncorhynchus keta</i>). ● Ban on commercial-scale fishing of sturgeons in the open Caspian sea.
1962–1963	Carrying out of the sturgeon survey over the whole Caspian Sea.
1963	<ul style="list-style-type: none"> ● The “Catalog of Level Observations” systematizing all available results of level observations on the Caspian Sea was published. ● The large petroleum deposit Sangachaly-Duvanny, Azerbaijan was discovered.
1964	<ul style="list-style-type: none"> ● On the basis of the Sturgeon Fish Laboratory of CaspNIRO, the Central Research Institute for Sturgeon Fishery (CRISF) was established to investigate growth of commercial-scale sturgeon fishing. ● The Caspian Caviar-Balyk Production Association (KCBPA) was organized, to which almost the entire Caspian sturgeon catch (except Iran) was directed.

 20th century

- For the first time in the world, the mixed river-sea-going ship “Baltiysky–18” crossed seas, rivers, and lakes on the way from Murmansk to Baku, covering 5,540 km in 15 days and introducing a new route of cargo transport by water.
 - Industrial catch of sturgeon in the open (Caspian) sea was prohibited.
 - Reconstruction of the Volga-Baltic way, which connected the Northwest with the central and southern basins (the Caspian Sea), was completed.
- 1965
- First studies on the commercial growth of stellate sturgeon industry were initiated in the Volga Delta.
 - Final end of sturgeon fishing in the Northern Caspian.
 - The Caspian Fishery Research Institute (CaspNIRKh) in Astrakhan is established.
- 1966
- The first tests of airfoil craft on the Caspian Sea. In the West, they were named “Caspian Monsters.”
- 1967
- In Moscow, the Water Problems Institute of the USSR Academy of Sciences was organized which included investigations of the Caspian Sea.
- 1968
- The “Atlas of Invertebrates of the Caspian Sea” was published.
 - The Caspian ornithological station was established as a part of the system of the Astrakhan Nature Reserve.
 - Decision of Council of Ministers of USSR “About measures for Caspian pollution prevention” was accepted.
 - For the first time on the Caspian Sea a self-elevating drilling rig was used.
- 1970
- Disastrous earthquake in Daghestan (14 May, magnitude 6.6). Buinaksk City was almost destroyed.
 - The Ministry of Petroleum Industry of USSR divided the Soviet part of the Caspian Sea into sectors between Azerbaijan, Kazakhstan, and Turkmenistan. As a basis of definition, the medial line was taken.
- 1971
- Acceptance of the Ramsar Convention (The Convention on Wetlands of International Importance, especially as Waterfowl Habitat), which is an international treaty for the conservation and sustainable utilisation of wetlands. The Russian Federation ratified the convention in 1975.
- 1972
- The Communist Party’s Central Committee and the USSR Council of Ministers passed the resolution “On actions to prevent pollution of the Volga and Ural rivers with untreated wastewaters.” It ordered a complete cessation by 1980 of the disposal of untreated residential wastewaters by all cities located in the basins of these rivers.
 - The first issue of the academic journal “Water Resources” was published in which, later on, much attention was drawn to Caspian issues.
 - On the Caspian Sea there are 1,880 oil platforms, as well as more than 300 km of sea metal connecting piers, pile trestles, and pipe bridges.
- 1973
- The Krasnovodsk Region of the Turkmen SSR was formed.
 - Resolution of the USSR Council of Ministers No. 2262-p of 19.10.1973 “On commissioning of a water dividing structure in the Astrakhan Region with simultaneous water and land reclamation and development of agricultural fields in a part of the Volga Delta, the western ilmen, and lands in the Volga-Akhtuba floodplain.”
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 20th century

- Pursuant to the resolution of the State Committee for Science & Technology and the USSR Academy of Sciences, the Council on Complex Study of the Caspian Sea Problems was established. It was chaired by Corresponding Member of USSR AS, V.N. Kunin.
 - The world's first nuclear water-electric power station with desalter of productivity 120 thou m³/day was put into operation in Shevchenko (Aktau) City, Kazakhstan.
- 1974 Kazakhstan accepted the decision to establish a nature reserved zone in the northern part of the Caspian Sea. Development of mineral resources in the coastal zone was forbidden.
- The Scientific Centre “Caspiy” and the Caspian Biological Station were established in Azerbaijan.
- 1975
- Decision of the Council of Ministers of the USSR about the statement of a nature reserved zone in the northern part of the Caspian Sea.
 - Decision of the Council of Ministers of the USSR “About measures to maintain performance of Soviet obligations under the Ramsar Convention.”
 - The book by A.N. Kosarev “Hydrology of the Caspian and Aral seas” was published in Moscow State University.
- 1976
- Commissioning of the water dividing structure on the Volga for redistribution of the Volga flow in the low-water years (70–110 km³) to ensure adequate water resources in spawning grounds in the eastern part of the Volga delta.
 - Decision of CC CPSU and the Council of Ministers of USSR “About realization of complex research for scientific substantiation of volumes and sequences of works on territorial redistribution of water resources.”
 - Astrakhan gas-condensate field (balance taken stocks of free gas made at 1992 - 2,695 bln m³; condensate – 425 mln t) was discovered.
 - At XXV Congress of CC CPSU, the First Secretary of CC Communist Party of Turkmenistan, M.P. Gapurov, raised the question about the necessity of regulating the Caspian waters runoff into the Kara-Bogaz-Gol Bay.
- 1977
- *The lowest level (–29.03 m) of the Caspian Sea in the twentieth century.*
 - The Council of Ministers of the USSR accepted the decision “About additional measures on the protection of the Caspian Sea against pollution.” Termination of wastewater dumps into the rivers of the Caspian Sea Basin moved to 1985.
 - For the first time on the Caspian Sea, a deep-water (84 m), stationary sea platform to drill petroleum was established.
- 1978
- *Beginning of the Caspian sea level rise.*
 - A decision was taken on separation of Kara-Bogaz-Gol Bay from the Caspian Sea for saving Caspian waters and maintenance of the sea level.
 - The State Commission of Experts of the USSR State Planning Committee rejected the feasibility report on the hydroscheme in the strait of Kara-Bogaz-Gol and recommended blocking it with a solid dam.
 - Accident on the shelf of the oilfield Bakhar, Azerbaijan.
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20th century	
1979	<ul style="list-style-type: none"> ● The Islamic Revolution in Iran resulted in the overthrow of the Shah and the proclamation of the Islamic Republic. ● An attempt to introduce into the Volga Delta the <i>Mugil soiny</i> (mullet family). ● On the Caspian Sea, the System of Heights of 1977 relatively the zero of Kronstadt tide-gauge level is established. ● Discovery of the world's largest oilfield at Tengiz in Western Kazakhstan on the Caspian Sea coast. Taken stocks are 781.1 mln t.
1980	<ul style="list-style-type: none"> ● Resolution of the Communist Party Central Committee and the Council of Ministers "On integrated management of land, water, and fish resources of the Volga-Akhtuba floodplain and the Volga Delta." ● The offshore oilfield Gyuneshli was put into commercial operation. ● Kara-Bogaz-Gol Bay was blocked with a solid dam (water level difference between the sea and the bay was 3.5 m). Area of the Bay was 10,000 km², with a volume of surface brine of 20–22 km³ and an average depth of 2.1 m (as much as 3–3.5 m).
1981	<ul style="list-style-type: none"> ● Introduction of a new fishing regime aimed at preservation of the autumn-race sturgeons. ● At the S.M. Kirov shipyard, the first seal boat "Tyulen-I" was constructed. ● Discussion of the projects on the Caspian Sea "rescue" from forecasted shallowing.
1982–1983	<ul style="list-style-type: none"> ● "Scheme of complex use and protection of Volga Basin water resources" is created. It was based on the concept of transferring part of the northern river runoff and putting the canals Volga-Don II (5.5 km³), Oka-Don (1.4 km³), and Volga-Ural (17.3 km³) into full capacity operation by the year 2000. Simultaneous construction of the Volga-Chograi Canal was suggested.
1983	Decision of the Council of Ministers of the USSR "About measures on creation of a resort base of general importance on the Caspian coast."
1984	<ul style="list-style-type: none"> ● Plenary Meeting of CPSU CC "On long-term program of land reclamation and improved management of irrigated and drained lands for sustainable growth of the food stock of the country." ● Resolution of CPSU CC and the Council of Ministers "On creation of the Circum-Caspian oil-gas complex" comprising the Aktyubinsk, Guriev, and partially the Mangyshlak regions of the Kazakh SSR as well as Astrakhan, a part of Volgograd, Saratov regions, and the southern part of the Kalmyk ASSR. ● The Governmental decision is accepted on renewal of sea water drain (volume 2 km³/year) into Kara-Bogaz-Gol Bay, constructing a temporary water release because the surface brine has dried up completely, and the bay has become a dry saline lake. ● First signs of myopathy – exfoliation of muscles connected to metabolic disease in muscular tissue – in Volga-Caspian sturgeon.

20th century	
1985	<ul style="list-style-type: none"> ● Chirag oilfield was discovered in the Azerbaijan deep-water part of the Caspian. ● For 14 months, oilwell No. 37 flowed openly in the Tengiz oilfield, Kazakhstan. Into the atmosphere were thrown more than 4 mln t of petroleum and 2.5 bln km³ of gas with dangerous concentrations of hydrosulfuric compounds.
1986	<ul style="list-style-type: none"> ● Decision of CC CPSU and the Council of Ministers of the USSR “About stopping work on transferring a part of northern and Siberian rivers runoff.” ● First edition of book series “The Caspian Sea,” Acad. Sci. USSR, GKNT USSR, Scientific Council on the complex study of the Caspian Sea problems, and the Water Problems Institute of USSR AS. The first book was “Fauna and biological productivity.” From 1986 to 1993, nine books were published.” ● The book edited by S.S. Baidin and A.N. Kosarev “The Caspian Sea. Hydrology and Hydrochemistry” was published in Moscow.
1987	<ul style="list-style-type: none"> ● Stage I of the Astrakhan gas-condensate plant was commissioned. ● The Azeri oil-gas field was discovered in Azerbaijan. ● Myopathy in Volga-Caspian sturgeons becomes pandemic. ● The interdepartmental scientific program “Sturgeon” was accepted. ● Daghestan Nature Reserve for study and protection of Kizlar Bay of the Caspian Sea and the unique natural formation Sarikhum Barchan was founded.
1988	<ul style="list-style-type: none"> ● <i>The level of the Caspian Sea reached –27.62 m.</i> ● Resolution of CPSU CC and the Council of Ministers “On urgent actions for improved management of water resources in the country.” ● Joint meeting of Presidium of USSR AS and VASKhNIL for discussion of the subject “On scientific validation of the ecological and economic feasibility of the Volga-Chograi Canal construction.”
1989	<ul style="list-style-type: none"> ● USSR Council of Ministers passed the resolution on stopping construction of the Volga-Chograi Canal. ● “CaspNIRKh” merged with CNIORKh. ● Organisation of the Research and Coordination Centre “Caspian” in USSR AS Moscow.
1990	Disastrous earthquake in Northern Iran in the Caspian Sea area (21 June, magnitude 7.7, 50 thou people died).
1991	<ul style="list-style-type: none"> ● The book edited by A.N. Kosarev “The Caspian Sea. Water Structure and Dynamics” was published in Moscow. ● Constitutional Act “On Independence of the Azerbaijan Republic” adopted. ● The independent Russian Federation was formed. ● The independent Turkmenistan was formed. ● The Supreme Council of the Kazakh SSR passed the law “On independence of the Republic of Kazakhstan.” ● In Alma-Ata, the Declaration on Formation of the Commonwealth of Independent States (CIS) was signed. ● Kazakhstan and Turkmenistan joined the CIS. ● The Russian Federation prepared the Draft Agreement on Preservation and Utilization of Caspian Bioresources.

20th century

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- In Baku, the First International Conference on the Caspian was held.
 - By the Decision of Commission of Council of Ministers of RSFSR on extreme situations, the Russian Committee for Water Management together with the USSR AS and other organisations was charged with preparing the “Technical and Economic Report on protection of economic objects and settlements in the coastal strip within the limits of Daghestan ASSR, Kalmyk ASSR, and Astrakhan region against flooding in connection with increases of the Caspian Sea level.”
- 1992
- The feasibility report “Caspian” was prepared (see 1991) by the efforts of nearly 20 organizations of the Russian Academy of Sciences (RAS), RF Ministries of Construction, Transport, Agriculture, the Russian Committee for Hydrometeorology (“Roskomgidromet”), Moscow State University, and others.
 - Order of RF President “On actions for sturgeon protection in the Caspian Basin.”
 - The Commission (an interdepartmental body) on Aqueous Bioresources of the Caspian Sea was established comprising Azerbaijan, Kazakhstan, Turkmenistan, and Russia.
 - Iran proposed an initiative on establishment of the Organization for Cooperation of the Caspian States.
 - Russia, Kazakhstan, and the Sultanate of Oman established the Caspian Pipeline Consortium (CPC).
 - Under the Project “Seas” of the Research-Technical Program of the USSR Committee for Science and Technology, “World Ocean” vol. 6 “Caspian Sea” was published (Issue 1: “Hydrometeorological Conditions”).
 - Order of RF President on state support of revival of the Russian merchant fleet on the Caspian and special Decision of Government of Russian Federation on its performance.
 - Company “Kazakhstankaspiyshelf” established.
 - Decree of President of Russian Federation “About measures to protect the population and decision of problems connected to the rise of the Caspian Sea level.”
- 1993
- Turkmenistan passed the Law “On State Border” on the basis of which it declared the establishment of the 12-mile zone of territorial waters and the exclusive economic zone.
 - Resolution of the Kazakhstan Council of Ministers No. 936 on permission of geophysical and geological surveys as well as hydrocarbon production in the preserved area of the Caspian Sea with regard to special ecological requirements.
 - Decision of the Council of Ministers of the Russian Federation “About urgent measures in 1993–1995 to prevent flooding and underflooding of cities, settlements, industrial and non-productive objects, agricultural grounds, and other valuable lands located along the coastal strip of the Caspian Sea.”
 - Order of the Maritime Transport Department of the RF Ministry of Transport “On renaming the Astrakhan Association of Maritime Transport in the North-Caucasian Maritime Shipping Company.”
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20th century

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- 1994
- On the basis of the Ikryaninsky Sturgeon Rearing Farm, the Research-Production Center for Sturgeon Farming (RPC SF) was established.
 - Russia approached the UN with the “Position of the Russian Federation on the Legal Status of the Caspian Sea.”
 - By order of the RF President, the National Plan of Action on the Environment was approved. It outlined the “grave environmental situation on the Caspian” and proposed to elaborate and implement in 1994–1996 the State Program for “Reproduction, Preservation and Rational Management of Sturgeons in the Caspian Sea.”
 - The Astrakhan Maritime Rescue-Coordinating Center of the Marine Administration of Astrakhan Port was established.
 - Decree of the Government of the Russian Federation on development and realization of the Special Federal Program “Improvement of ecological conditions on the river Volga and its tributaries to stop and prevent degradation of natural complexes of Volga Basin.” It was named “Revival of Volga.”
 - Interstate Ecological Council of the CIS countries addressed the UN Environment Programme (UNEP) with a request to render assistance in development of the Frame Convention on the protection of the sea.
 - The first petroleum contract, called the “Contract of the Century,” on development of the oilfields Chirag, Azeri, Guneshli was signed.
 - The book by A.N. Kosarev and E.A. Yablonskaya “The Caspian Sea” was published in the Netherlands.
 - The book by S.N. Rodionov “Global and Regional Climate Interaction: The Caspian Sea Experience” was published in Kluwer, Dordrecht.
- 1995
- The Parliament of the Islamic Republic of Iran passed the resolution on establishment of the Center for Caspian Sea Study “Khazar.”
 - The Constitution of the Azerbaijan Republic was approved. Art. 11 stated that the sector of Caspian Sea belonging to the Republic and the air space over it were integral to the territory of the country.
 - In the U.S.A., publication of the quarterly “Caspian Crossroads” began.
 - For the first time in its history, the UN General Assembly passed the Resolution “Permanent Neutrality of Turkmenistan,” imparting a new international legal status to the country.
 - Azerbaijan signed the second oil contract on development of the Karabakh oilfield.
 - Resolution of the RF Government “On supplementary actions to protect the population and to address other issues related to the Caspian sea level rise.”
 - Caspian Caviar-Balyk Production Association was privatized and reorganized into the Open Joint Stock Company “Russian Caviar.”
 - Russia’s first parliamentary hearings on the Caspian were held.
 - *The rise of the Caspian Sea level reached the maximal mark (–26.61 m) and sea level started to decrease slowly.*
 - Scientific Council on the problem “Complex use and protection of natural-economic resources of the Caspian Sea and its Basin” (Ministry of Science of Russian Federation, Presidium of RAS, Russian Committee for Water Management) was established.
 - The book by A.N. Kosarev and V.S. Tuzhilkin “Climatic Thermohaline Fields of the Caspian Sea” was published in Moscow.
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20th century

- 1996
- The Kazakhstan Navy on the Caspian Sea was formed.
 - Agreement on construction and operation of the oil pipeline Baku (Sangachal terminal on the Caspian shore)–Supsa (Georgian oil terminal on the Black Sea) – 893 km long, almost half of which (443.3 km) would be through Azerbaijan – with a carrying capacity 5 million tons a year (105 thou barrels a day) was signed.
 - Within the framework of the RF Foreign Ministry, the Working Group on the Caspian Sea was established. It was charged with elaboration of proposals on the RF position on the Caspian status and regime, management of its life and mineral resources, and also on its oil transport.
 - The Ad Hoc Working Group of the Deputy Foreign Ministers of the Caspian States was set up for preparation of the Convention on the Legal Status of the Caspian Sea.
 - World Wildlife Fund (WWF) published the report TRAFFIC Network: “Sturgeons of the Caspian Sea and International Caviar Trading.”
 - In Russia “The Caspian Sea Bulletin” Journal (6 issues a year) started publishing.
 - The International Institute on Sturgeon Study was set up in Rasht, Iran.
 - United mission of experts of the World Bank, UNEP, and UNDP devised the framework of “the Caspian initiative” on the Caspian countries to prepare the international Caspian Ecological Program (CEP) and create a legal tool to protect and steady usage of the Caspian Sea.
 - Decision of Russian Federation “About prime measures in 1996–1997 on protection of populations and prevention of the flooding of economic and other investments located on the coast of the Caspian Sea.”
 - Russia and Iran signed a fishery agreement.
 - Azerbaijan signed petroleum development contracts on deposits (Shakh-Deniz, Dan-Ulduzu and Ashrafi) in the Caspian Sea.
- 1997
- The RF Government Commission on the Caspian Sea problems was established.
 - The RF Government Commission on coordination of activity and operations addressing the problems of protection of live resources in territorial waters, on the continental shelf, and in exclusive economic zone of the Russian Federation in the Caspian and Azov Seas (22.04.1997, No. 457).
 - The first meeting of the Ad Hoc WG at the level of Deputy Foreign Ministers of the Caspian States was convened in Alma-Ata, Kazakhstan to develop the Convention on the Legal Status of the Caspian Sea.
 - First “early oil” was produced at the Chirag oilfield, Azerbaijan.
 - In Appendix II of The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, also known as the Washington Convention, signed March 3, 1973), sturgeons were included.
 - Azerbaijan signed petroleum development contracts for deposits of the Caspian Sea at Lenkoran-Deniz and Talysh-Deniz, Yalama, Apsheron (formerly Zeinalabdin Tagiev), and Nakhichevan (formerly D-3).
 - Publication of the first release from the series “Geoecology of the Caspian Sea,” generalizing long-term results of scientific research of the Faculty of Geography of Moscow State University.
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 20th century

- 1998
- Organization of the Caspian Regional Thematic Centers (CRTC) in the Caspian States under the Caspian Environmental Program (CEP). Two CRTCs were established in Russia: (1) CRTC on sustainable management of fish and other commercial biological resources on the basis of CaspNIRKh; and (2) CRTC on institutional, legal, control and economic mechanisms of environment management on the basis of the Center for International Projects (Moscow).
 - Treaty was signed between Russia, Kazakhstan, and six foreign oil companies (LUKOIL, Chevron, Arco, Mobil, AMOCO, and Orient) on construction of the pipeline Tengiz–Styurets–Astrakhan–Novorossiysk (1,500 km long, carrying capacity of 20 million tons of oil a year).
 - In the USA, the document publicly known as the Caspian Basin Initiative was published and the post of the President’s Special Advisor on power issues of the Caspian Basin was created.
 - The 3 months long expedition of the Cousteau Society on the Caspian Sea on the ship “Alcyone” under the auspices of UNESCO/IOC.
 - In December, the second meeting of the Ad Hoc WG at the level of Deputy Foreign Ministers of the Caspian States was convened in Moscow for development of the Convention on the Legal Status of the Caspian Sea.
 - Agreement between the Russian Federation and the Republic of Kazakhstan on delimitation of the northern part of the Caspian Seabed to mark sovereign rights concerning the bowels management.
 - Decision of the Russian Federation “To prolong for 1998–2000 the timeframe of realisation of the prime measures to protect populations, economic, and other investments on the coast of the Caspian Sea”.
 - Decree of the Russian Federation about preparation of the special Federal Program on complex development of territory of Russian Federation adjoining the Caspian Sea.
 - Decision of the Russian Federation “On performance of the recommendations from the 10th conference of states that signed the *Convention on International Trade in Endangered Species of Wild Fauna and Flora, threatened species* from March 3, 1973 in relation to sturgeon.”
 - The final variant of the concept on the basis of the Caspian Ecological Program (CEP) is accepted. First steps in implementation of CEP are realized.
 - Azerbaijan signs petroleum developmental contracts on deposits of the Caspian Sea, including Kyurdashi, Gobustan and Hyursangi, Gabogly (by land), Inam, and Abikh.
 - New operational company OKIOC (Offshore Kazakhstan International Operating Company N.V.) is established, and realization of drilling works on the Kazakhstan shelf of the Caspian Sea is assigned to it. In 2001 OKIOC was renamed to “Agip Kazakhstan North Caspian Operating Company N.V.” (Agip KCO).
- 1999
- Azerbaijan stopped work on the Karabakh oilfield due to the absence of oil.
 - Azerbaijan signed contracts on development of offshore oilfield Zafar-Mashal and Lerik as well as the land-based block Padar.
 - Order of Turkmenistan President S. Niyazov “On formation of the National Service on development of the Turkmen sector of the Caspian Sea at the President of Turkmenistan”.
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20th century

- The work of R. Sokolsky and T. Charlick-Palay, “NATO and Caspian Security. A Mission Too Far?” prepared under the Project AIR FORCE (PAF), a division of RAND, which is the United States Air Force’s Federally Funded Research and Development Center (FFRDC) for studies and analyses, was published.
- OKIOC began drilling the first oil prospecting well on the Kazakh shelf of the Caspian Sea (Eastern Kashagan – I).
- A package of agreements was signed on construction of the main oil pipeline Baku–Tbilisi–Ceyhan.
- Presidents of Azerbaijan, Georgia, Turkey, and Turkmenistan sign the Intergovernmental Declaration on Principles of Realization of the Trans-Caspian Pipeline, which was witnessed by US President Bill Clinton.
- In Azerbaijan, the quarterly journal “Caspian Energy” started circulation.
- American journal “National Geographic,” in its 100th anniversary edition, published the article and maps of the Caspian Sea.
- *Mnemiopsis leidyi* was first discovered near the eastern coast of the Middle Caspian.
- The centenary of the first oil production on the territory of Kazakhstan was celebrated in Atyrau, Kazakhstan.
- The feasibility report for a project to construct an oil pipeline from Western Kazakhstan to Western China was prepared. The length of the pipeline would be 3 thou km, with a carrying capacity of 45 million tons a year and an approximate cost of US\$ 2.2 billion.
- Parliamentary hearings of the Commission on Natural Resources and Nature Management of the RF State Duma on conservation and management of Caspian natural resources.
- The oil pipeline Baku (Azerbaijan) – Supsa (Georgia) for transport of “early” Azerbaijan petroleum to external markets was put online.
- Drilling of the first oil well on the Kazakh shelf of the Caspian Sea (East Kashagan) began.

2000

- Meeting of the RF Security Council chaired by RF President V.V. Putin on issues of the Caspian region and related Russian policy. The Caspian Sea was declared a zone of traditional national interests in Russia.
- By order of the RF President, V.I. Kaluzhny, as a Deputy Foreign Minister, was appointed Special Envoy on settlement of the Caspian Sea legal status.
- RF President V.V. Putin and Kazakhstan President N. Nazarbaev signed the “Declaration between the Russian Federation and the Republic of Kazakhstan on Cooperation on the Caspian Sea.”
- Azerbaijan, Georgia, and Turkey signed the Agreement on the Legal Basis for Construction of the Oil Pipeline Baku–Tbilisi–Ceyhan.
- The Intergovernmental Declaration on Principles of Realization of the Trans-Caspian Pipeline was signed between Azerbaijan, Georgia, Turkey, and Turkmenistan to implement the Trans-Caspian Pipeline Project.
- Round-table meeting (April 27–28) of the Commission on CIS Affairs of the Federation Council on legal support of the interests of the Russian Federation in the Caspian Basin.
- According to estimates, from 10 to 40 thou seals died on the Caspian. One of the causes was distemper.

 20th century

- Kazakhstan declared discovery of a new oilfield of worldwide significance in the Eastern Kashagan structure of the North Caspian. According to preliminary evaluations, its reserves varied from 5 to 7 billion tons.
- OKIOC started oil drilling in the Western Kashagan oilfield.
- “Gazprom,” LUKOIL, and Yukos established the joint Caspian Petroleum Company for oil prospecting and production in the Northern Caspian.
- LUKOIL declared discovery of a large offshore oilfield, Khvalynsky, in the North Caspian, the oil reserves of which were evaluated at 300–400 million tons.
- The last joint of the Tengiz (Kazakhstan)–Novorossiysk (Russia) oil pipeline was welded.
- Earthquake in the Caspian Sea area with a magnitude of 7 points on the Richter Scale. There were victims and destruction in Baku as well as minor destructions Balkanabat (formerly Nebit-Dag).
- The Kazakhstan–Russia Agreement on transit of Kazakh oil via the Baku–Makhachkala–Novorossiysk Pipeline was signed. According to expert estimates, this pipeline would ensure transport of about 3 million tons of hydrocarbons a year.

 21st century

2001

- Joint declaration of the Russian Federation and Azerbaijan on principles of cooperation on the Caspian Sea was signed by RF President V.V. Putin and Azerbaijan President H. Aliyev (Baku, January 9).
 - In February in Tehran, Iran, the Third Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States was convened for development of the Convention on the Legal Status of the Caspian Sea.
 - Visit to Moscow of the President of Iran. Negotiations resulted in RF President V. Putin and IRI President S. Khatami signing the Joint Declaration on the Legal Status of the Caspian Sea (March 12).
 - The Marine Doctrine of the Russian Federation until 2020 was adopted in which the Caspian direction was identified as one of the major regional directions in the RF national marine policy.
 - The first international parliamentary hearings on the legal status and economic issues of the Caspian Sea were held in the RF State Duma.
 - In June in Baku, Azerbaijan, the Fourth Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States was convened for development of the Convention on the Legal Status of the Caspian Sea.
 - The RF Federation Council addressed the Parliaments of the Caspian States with an initiative on establishment of the Interparliamentary Caspian Assembly.
 - At Port Olya, Astrakhan Region, a second wharf of 150 m long was commissioned.
 - The major investor of Azerbaijan oil projects, “Exxon-Mobil” (USA), declared cutbacks of works on some oilfields due to the absence of oil there.
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 21st century

- In September in Astana, Kazakhstan, the Fifth Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States was convened for development of the Convention on the Legal Status of the Caspian Sea.
 - The Federal Program on Integrated Development called “South of Russia” was adopted. Its implementation was planned for the period until 2006. Its total cost was 152 bln Rubles.
 - The Republic of Kazakhstan and the Republic of Azerbaijan signed the Agreement on Delineation of the Caspian Sea Bottom between Azerbaijan and Kazakhstan.
 - An intergovernmental agreement was signed between Georgia and Azerbaijan on transit of Azerbaijani gas from the Shakh-Deniz field to Turkey via Georgia.
 - Astrakhan held the International Conference “Caspian 21: From Politics to Business.”
 - With the TACIS support, the Caspian Marine Expedition on Fish Census was carried out in practically all parts of the Caspian Sea (except of the water area near the Turkmenistan coast).
 - In Baku, the book by A.S. Aliev, “Caspian Sea Level Rise and Flooding of the Coastal Zone in Azerbaijan,” was published.
 - In Almaty, the book by E.S. Karibuzhnov, “Modern Petroleum Business and Kazakhstan,” was published.
 - *In winter 2001/2002 the Caspian Sea level decreased to –27.3 m and sea level started to rise again.*
- 2002
- In January, Moscow hosted the Sixth Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States was convened for development of the Convention on the Legal Status of the Caspian Sea.
 - By order of the Kazakhstan President, the National Company “KazMunaiGaz” was established, merging “KazakhOil” and “Oil and Gaz Transport.”
 - In April in Ashkhabad, Turkmenistan, the Extraordinary Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States was convened for development of the Convention on the Legal Status of the Caspian Sea.
 - The first Caspian Summit of the leaders of the five Caspian States was held on April 23–24 in Ashkhabad, Turkmenistan.
 - On April 24–27, RF President V.V. Putin visited the Astrakhan Region.
 - Kazakhstan signed the Memorandum on Energy Partnership and the Agreement on Oil Supply with the USA.
 - The Protocol to the 1998 Bilateral Agreement was signed between RF and the Republic of Kazakhstan in May in Moscow. It delineated the bottom in the Northern Caspian for exercise of sovereign rights in subsoil utilization and fixed the modified median line delimiting the subsoil use zones of two countries.
 - In May, the protocol on joint development of disputable oilfields in the Kazakhstan-Russian area (Kurmangazy, Tsentralnoye, and Khvalynskoe).
 - In July, the Seventh Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States was convened in Tehran, Iran to develop the Convention on the Legal Status of the Caspian Sea.
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 21st century

- On August 1–15, the RF Caspian Fleet held a joint sea training with participation of the Navies of Azerbaijan and Kazakhstan and observers from Iran.
- Ceremony laying the foundation of the export pipeline Baku–Tbilisi–Ceyhan in Sangachaly was attended by the Presidents of Azerbaijan, Georgia, and Turkey. The total length of the pipeline was 1,730 km, including 468 km in Azerbaijan, 225 km in Georgia, and 1,037 km in Turkey. The pipeline’s diameter was 1,067 mm (42 in.), and it had a carrying capacity of 50 million tons a year.
- Moscow hosted the International Conference “Caspian: Legal Issues.”
- The multi-purpose interstate all-Caspian marine expedition on assessment of the sturgeon condition was organized.
- On October 22, the ferry “Merkurii-2” sank at a depth of 155 m 130 km from the shore. It was transporting 16 tanks containing 60 t of crude oil each from Aktau. 37 people died, and 13 people were rescued. An 8 × 15 km oil slick formed on the sea surface.
- LUKOIL withdrew from the Consortium of the Azerbaijan “Project of the Century” (Azeri–Chirag–Gyuneshli).
- Presidents of Turkmenistan and Afghanistan and also Prime Minister of Pakistan signed the intergovernmental agreement on construction of the Trans-Afghan gas pipeline (Dovletabad–Kandagar–Multan).
- Iran was admitted to the Commission on Aqueous Bioresources of the Caspian Sea as a full-fledged member.
- The Second International Conference “Caspian 21: From Politics to Business” was held in Astrakhan.
- The Astrakhan Region Administration, the Astrakhan State Pedagogical University, and the Russian Philosophical Society started publishing the journal “Caspian Region: Politics, Economics, and Culture.”
- Agreement was signed between the Russian Federation and Azerbaijan on delineation of the neighboring sections of the Caspian Sea bottom.
- The RF Federation Council approved the working group on development of proposals on establishment of the Interparliamentary Caspian Assembly.
- By the resolution of the Commission on Aqueous Ecological Resources of the Caspian Sea, summer and winter general Caspian trawl-acoustic surveys became regular yearly events.

2003

- The Eighth Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States was convened in Baku, Azerbaijan to develop the Convention on the Legal Status of the Caspian Sea.
 - In Almaty, Kazakhstan, the Ninth Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States was convened for development of the Convention on the Legal Status of the Caspian Sea.
 - Agreement was signed by the Russian Federation, Azerbaijan, and Kazakhstan on the crossing point of delimitation lines of neighboring sections of the Caspian Sea bottom (May 14).
 - Moscow welcomed the Tenth Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States to develop the Convention on the Legal Status of the Caspian Sea.
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 21st century

- Ashkhabad, Turkmenistan hosted the Eleventh Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States for development of the Convention on the Legal Status of the Caspian Sea.
- The International Conference on Caspian Ecology was held in Aktau, Kazakhstan.
- Kazakhstan approved the State Program of Development of the Caspian Kazakh Sector until 2015.
- H.A. Aliyev, former President of Azerbaijan, died.
- I.H. Aliyev, the son of H.A. Aliyev, was elected President of Azerbaijan.
- Five Caspian States signed the Framework Convention on Protection of the Marine Environment of the Caspian Sea.
- Tehran, Iran held the Twelfth Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States for development of the Convention on the Legal Status of the Caspian Sea.
- CaspNIRKh together with the research organizations of the Caspian states signed the “Regional program of the Caspian states on joint management, preservation, and sustainable development of the bioresources of the Caspian Sea.”
- In the USA, the book by Lutz Klevevan, “The New Great Game: Blood and Oil in Central Asia,” was published.
- In Astrakhan, the First International Workshop “Methods of Evaluation of the Sturgeon Resources and Determination of Their Total Admissible Catches” was convened.
- In Moscow, the First International Conference on Legal Issues of the Caspian, Azov Basin, and Multi-Purpose Utilization of the Marine Environment was held.
- A 5 volume series of books under the general title “Ecology and the Oil-Gas Complex,” edited by M.D. Diarov, was published by the Atyrau Institute for Oil & Gas and the Research Center of Regional Environmental Problems of Kazakhstan.
- Publication of the journal “Caspian Region: Politics, Economics, and Culture” was initiated in Astrakhan.
- Russia and Turkmenistan signed the Treaty on Cooperation in the Gas Industry for a term of 25 years.
- The USA hastened created the quick deployment forces “Caspian Guard” for protection of the oil pipeline Baku–Tbilisi–Ceyhan.
- The book by L.S. Ruban “The Caspy – the Sea of Problems” was published in Moscow.

2004

- Astana, Kazakhstan, held the Fourteenth Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States for development of the Convention on the Legal Status of the Caspian Sea.
 - The International Forum “Caspian: Politics, Economics, and Culture” was held in Astana.
 - The first meeting of the representatives of the states signatories of the Framework Convention on Protection of the Marine Environment of the Caspian Sea was convened in Tehran, Iran.
 - The International Conference, “Geostrategic Significance of the Caspian Region: Perspectives of Cross Border Cooperation,” was held in Astrakhan.
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 21st century

- Istanbul was the venue of the International Conference on Ecology of the Caspian and Black Sea Regions.
 - In Moscow, the “Caspian Encyclopedia” by I.S. Zonn was published by the “Mezhdunarodnye Otnosheniya” (international relations) Publishers.
 - In Astrakhan, the monograph of A.V. Dmitriev, P.L. Korabuschenko, and R.H. Chemanov, “Geopolitics of the Caspian Region (Outlook from Russia),” was published.
 - In Astrakhan, the work of S.V. Novoselov and A.M. Lipchansky, “Politics of the National Security of Russia in the Caspian Region (1991–2002),” was published.
 - In Moscow, the book by I.S. Zonn and S.S. Zhiltsov, “Caspian Region: Geography, Economics, Politics, and Cooperation,” was published.
 - Moscow held the meeting of Foreign Ministers of the Caspian States.
 - In Baku, the Fifteenth Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States was convened for development of the Convention on the Legal Status of the Caspian Sea.
 - The International Conference “Oil and Gas of the Caspian and Black Seas” was convened in Strasburg.
- 2005
- The Moscow State Institute of International Relations published the book of V.A. Salygin and A.F. Safaryan, “Present International Economic Relations in the Caspian Region.”
 - Mahmoud Ahmadinejad was elected President of Iran.
 - The fundamental book, “The Caspian Sea Environment,” edited by A.G. Kostianoy and A.N. Kosarev, was published by the German Publishers Springer-Verlag.
 - The book by G.N. Panin, R.M. Mamedov, and I.V. Mitrofanov, “The Modern State of the Caspian Sea,” was published in Moscow.
 - The book by I. Zaslavsky, “Baku-Tbilisi-Ceyhan Pipeline and Kazakhstan Vector on the Caspian,” was published in Moscow.
 - The book by S.A. Lebedev and A.G. Kostianoy, “Satellite Altimetry of the Caspian Sea,” was published in Moscow.
 - The book by I.S. Zonn, “Black Pearl of the Caspian: Everything about Black Caviar,” was published in Moscow.
 - Ashkhabad was the venue of the Sixteenth Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States for development of the Convention on the Legal Status of the Caspian Sea.
 - The book by I.S. Zonn, “The Outline on the History of the Caspian Sea Studies,” was published in Moscow.
 - The International Scientific-Practical Conference, “The Problems of Preservation of the Caspian Ecosystem in Conditions of Oilfield Development,” was held in Astrakhan.
 - Tehran, Iran held the Seventeenth Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States for development of the Convention on the Legal Status of the Caspian Sea.
 - In Baku, a festive ceremony was held in connection with commissioning of the Azerbaijan section of the main export oil pipeline Baku–Tbilisi–Ceyhan.
 - The International Conference, “Transgression of the Caspian Sea,” was convened at Gilan University in Rasht, Iran.
 - RF President V.V. Putin visited the Astrakhan Region and Daghestan.
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 21st century

- Istanbul was the venue of the Third International Summit, “Ecology of the Black and Caspian Seas.”
 - Baku held the Eighteenth Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States for development of the Convention on the Legal Status of the Caspian Sea.
 - The International Conference, “Energy Security in the Caspian Sea Region,” was held in Garmisch-Partenkirchen, Germany.
 - Almaty held the International Scientific-Practical Conference, “The Caspian Sea: the Legal Regime, Regional Security, and Ecology.”
 - *In summer 2005 the Caspian Sea level reached –26.7 m and sea level started to decrease slowly again.*
- 2006
- The International Conference, “The Modern State and Ways for Improved Research in the Caspian Basin,” was held in Astrakhan.
 - Turkmenistan approved the Program of Oil and Gas Industry Development until 2030.
 - Turkmenistan President S. Niyazov died.
 - Enforcement of the Framework Convention on Protection of the Marine Environment of the Caspian Sea.
 - The International Conference “Caspian Perspectives, 2008” was held in Bled City, Slovenia.
 - Russia’s proposal on creation of the joint operative union “KASFOR” on the Caspian.
 - Kazakhstan ratified the Framework Convention on Protection of the Marine Environment of the Caspian Sea.
 - Moscow was the venue of the Twentieth Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States for development of the Convention on the Legal Status of the Caspian Sea.
 - LUKOIL discovered a large multi-layer oil and gas condensate field in the Northern Caspian (license site “Severnyi”).
 - The work “Scientific Basis of Environment Protection in the Northern Caspian in Conditions of Oil and Gas Fields Development” was published in Astrakhan.
 - A complex for artificial sturgeon farming was commissioned in Kiyanly, Turkmenistan.
 - Azerbaijan ratified the Framework Convention on Protection of the Marine Environment of the Caspian Sea.
 - The oil pipeline Baku–Tbilisi–Ceyhan was finally put into operation.
 - In connection with enforcement of the Framework Convention on Protection of the Marine Environment, UNEP published the work, “Vital Caspian Graphics: Challenges Beyond Caviar.”
- 2007
- Feasibility study for the navigation waterway between the Caspian and Azov-Black Sea Basins (Project “Eurasia”) was initiated.
 - The book by A.B. Shirokorad, “The Caspian: the Russian Lake – The Great Volga Way, Great Oil, and Great Politics,” was published.
 - The book by M. Kirokosjan, “Pirates of the Caspian Sea,” was published.
 - G. Berdimuhamedov was elected President of Turkmenistan.
 - The Presidents of Russia, Turkmenistan, and Kazakhstan signed the Declaration on Construction of the Caspian Gas Pipeline (1,000 km long).
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 21st century

- At the Eleventh Petersburg Economic Forum, Kazakhstan President N. Nazarbaev proposed connecting the Caspian and Black Seas by an Eurasian Canal.
- Ashkhabad, Turkmenistan hosted the Twenty-First Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States for development of the Convention on the Legal Status of the Caspian Sea.
- Tehran, Iran was the venue for the Third Meeting of Foreign Ministers of the Caspian States.
- Reconstruction of the vessel “Orel” was started in Astrakhan.
- RF President V.V. Putin visited the Astrakhan Region.
- The second summit of the leaders of the Caspian Sea littoral states was held in Tehran.
- Volume 1 “Nature” of the “Astrakhan Encyclopedia” was published in Astrakhan.
- The Astrakhan University published the book by D.N. Panasenko, “International Legal Regime of Economic Management of the Caspian Sea Natural Resources.”
- The Conference “Oil and Gas Transportation in the CIS Countries and the Caspian Region” was convened in Vienna, Austria.
- “Kazmunaigaz” and SOCAR signed the agreement on strategic partnership in the oil industry that envisaged joint implementation of the Trans-Caspian Project. In the future, this project would become a part of the planned Kazakhstan Caspian Transportation System (KCTS).
- The book by I.B. Ezhiev, “The Geopolitics of the Caspian Region,” was published in Moscow.
- The monograph of M.V. Bolgov, G.F. Krasnozhon, and A.A. Lyubushin, “The Caspian Sea: Extreme Hydrological Events,” was published in Moscow.
- The Second International Scientific-Practical Conference, “The Problems of Preservation of the Caspian Ecosystem in Conditions of the Oilfields Development,” was held in Astrakhan.
- CITES introduced an annual moratorium in the Caspian countries on export of beluga caviar.

2008

- The work of S.V. Novoselov, “The Military-Political Situation: Assessment and Forecast Methodology (Case Study of the Caspian Region),” was published in Astrakhan.
 - Baku was the venue of the International Conference, “The Oil and Gas Potential of Turkmenia and Azerbaijan: Energy, Economics, and Ecology.”
 - The General Consulate of Azerbaijan was opened in Aktau, Kazakhstan.
 - Festivities in Kazakhstan on occasion of the 35th anniversary of the formation of Mangistau Region and the 45th anniversary of the formation of the regional center Aktau.
 - The Second Caspian Humanitarian Forum was held in Aktau.
 - Turkmenbashi was the venue of the Summit between Azerbaijan, Turkmenistan, and Turkey.
 - Tehran, Iran hosted the 22nd Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States for development of the Convention on the Legal Status of the Caspian Sea.
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21st century

- Moscow held the Caspian Energy Forum, “The Energy of the Caspian Sea.”
 - The pilot issue of the international information-analytical journal, “The Caspian Vector,” was published in Aktau, Kazakhstan.
 - The book by R.A. Ibraev, “Mathematical Modeling of Thermal Hydrodynamic Processes in the Caspian Sea,” was published in Moscow.
 - Baku held the 23rd Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States for development of the Convention on the Legal Status of the Caspian Sea.
 - The annual moratorium on export of black caviar for the Caspian States was raised.
 - Celebration of the 450th Anniversary of Astrakhan.
 - The book by I.S. Zonn and S.S. Zhiltsov, “New Caspian: Geography, Economics, and Policy,” was published in Moscow.
 - Astana held the 24th Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States for development of the Convention on the Legal Status of the Caspian Sea.
 - The book by E.G. Kataeva and L.S. Rouban “Caspian Sea – the Sea of the Possibilities” was published in Moscow.
- 2009
- The book by S.S. Zhiltsov and I.S. Zonn, “The USA in Pursuit of the Caspian,” was published.
 - In “Aquatic Geochemistry” Journal an article “Kara-Bogaz-Gol Bay: Physical and Chemical Evolution” by Kosarev A.N., Kostianoy A.G., and Zonn I.S. was published.
 - Moscow held the 25th Meeting of the Ad Hoc Working Group at the level of Deputy Foreign Ministers of the Caspian States for development of the Convention on the Legal Status of the Caspian Sea.
 - Kazakhstan Border Guard discovered 218 semi rotten bodies of Caspian seals on the Bautino Spit.
 - Kazakhstan ratified the Treaty on construction of the gas pipeline in the Caspian Region.
 - *In winter 2009/2010 the Caspian Sea level decreased to –27.3 m again, that was a sea level reached in winter 2001/2002.*
- 2010
- The book by I.S. Zonn, A.G. Kostianoy, A.N. Kosarev, and M.H. Glantz “The Caspian Sea Encyclopedia” was published in Springer.
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List of Abbreviations

abs.	Absolute height over the World Ocean level (in meters)
A.D.	Anno Domini
ADB	Asian Development Bank
AS	Academy of Sciences
ASSR	Autonomous Soviet Socialist Republic
B.C.	Before Christ
B.C.E.	Before the Common Era
C.A.	Central Asia
CaspNIRKh	Caspian Research Institute for Fishery
CC (CPSU)	Central Committee of the Communist Party of the Soviet Union
C.E.	The Common Era
CIS	Commonwealth of Independent States
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNIORKh	Central Research Institute for Sturgeon Fishery
CSNPC	Commission on Study of Natural Production Capabilities in Russia
CPSU	Communist Party of the Soviet Union
cu.	cubic
EBRD	European Bank for Reconstruction and Development
ECO	Economic Cooperation Organization
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Development Product
GEF	Global Environment Facility
GGI	State Hydrological Institute (Russia)
GIS	Geographic Information System

GKNT (SCST)	The USSR State Committee for Science and Techniques
GNP	Gross National Product
GOELRO	State Commission for Electrification of Russia
GOIN	State Oceanographic Institute (Russia)
ha	hectare
HEP	Hydroelectric Plant
HMS	Hydro-meteo station
HPS	Hydroelectric power station
IBRD	International Bank for Reconstruction and Development
ICID	International Commission on Irrigation and Drainage
ICSD	Interstate Commission for Sustainable Development
ICWC	Interstate Coordination Water (management) Commission
IDB	Islamic Development Bank
INCO-Copernicus	The INCO-Copernicus programme promotes scientific and Technological cooperation with the Countries of Central Europe and the New Independent States of the former Soviet Union
INTAS	International Association for the promotion of co-operation with scientists from the New Independent States of the former Soviet Union
IOC	Intergovernmental Oceanographic Commission
IO RAS	P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences
IRI	Islamic Republic of Iran
JSC	Joint Stock Company
m abs. elev.	Absolute height over the World Ocean level (in meters)
MSU	Moscow State University (Russia)
NATO CLG	NATO Cooperative Linkage Grant
NGO	A non-governmental organization
OECD	Organisation for Economic Co-operation and Development
OIC	Organisation of the Islamic Conference
OPEC	Organization of the Petroleum Exporting Countries
OSCE	Organization for Security and Co-operation in Europe
RAS	Russian Academy of Sciences
RF	Russian Federation
RFBR	Russian Foundation for Basic Research
RGS	Russian Geographical Society
RSFSR	Russian Soviet Federal Socialist Republic
SCO	The Shanghai Cooperation Organization
SCP	State Committee for Planning (USSR)
SCST (GKNT)	The USSR State Committee for Science and Technology
SNK	Council of People's Commissars (USSR, 1923–1946)
SOCAR	State Oil Company of Azerbaijan Republic
SOPS	Council for Investigation of Production Forces

sq.	square
SSR	Soviet Socialist Republic
TACIS	Technical Assistance for the Commonwealth of Independent States
thou	thousand
TSFSR	Transcaucasian Socialist Federative Soviet Republic
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
USSR AS	The USSR Academy of Sciences
VASKhNIL	All-Union Academy of Agricultural Sciences of the Soviet Union (1929–1992)
VKP(b)	All-Union Communist Party of bolsheviks (USSR, 1925–1952)
VNIIMORGEO	All-Union Scientific Research Institute for Marine Geology and Geophysics (Russia)
VNIRO	All-Russia Scientific Research Institute for Fishery and Oceanography
VSNKh	Supreme Council of the Russian (1917–1932) and the Soviet Union (1963–1965) National Economy
WG	Working Group
WMO	World Meteorological Organization