"THE CASPIAN REGION: ENVIRONMENTAL CONSEQUENCES OF THE CLIMATE CHANGE"

THE INTERNATIONAL CONFERENCE

October 14–16, Moscow State University, Russia

The Caspian region has unique natural environments. Abrupt sea-level change is characteristic for this region. The observed sea-level drop that reached its lowest level of –29,01 m in 1977 was followed by the sea-level rise of up to –26,66 m in 1995. Geomorphologic, archaeological, cartographic and other evidence throughout historical times, as well as the results of paleogeographical studies covering tens of thousands of years, indicate that periodical variations in sea-level are a normal phenomenon of the unstable state of the enclosed body of water with changing conditions at its outer boundaries, with the climate change being the most important of these conditions.

Revealing the linkage between climate change, the Caspian sea-level change and development of the natural environments of the region is the defining condition for building a strategy for sustainable development of the region. Scientists from the Moscow State University's Faculty of Geography have devoted multiannual studies to solving this problem. Within the last two decades the interest of the international scientific community to the evolution of the Caspian and its coastal areas under conditions of high sea-level rise as a model of possible consequences of global climate warming has risen significantly. A number of scientific projects were carried out in cooperation with scientists from the Netherlands, Great Britain, Belgium, Iran, Canada, Azerbaijan, Kazakhstan and Ukraine.

To discuss the obtained results, the Faculty of Geography organized the International Conference on "The Caspian Region: Environmental Consequences of the Climate Change". Academician N.S. Kasimov – Dean of the faculty, became the leader of the Organizing Committee. As a scientific time frame, the conference focused on the final stage of Caspian development – the Holocene. This time interval in the history of the region is critical for it includes climatic events of different scale and opposite trends, and allows for understanding the response of the natural basin environments and coastal area to these climatic events.

The objectives of the conference drew a lot of interest from the scientific community. Scientists from all countries of the Caspian region – Azerbaijan, Iran, Kazakhstan, Russia and Turkmenistan, along with Great Britain, Canada, the Netherlands and Ukraine, participated. Scientific presentations showed the complexity of the study case. Specialists on different areas of expertise – climatologists, hydrologists, oceanographers, marine geologists, geomorphologists, cartographers, paleogeographers, geochemists, biologists and others – addressed fundamental and

applied questions associated with sustainable development of the Caspian region.

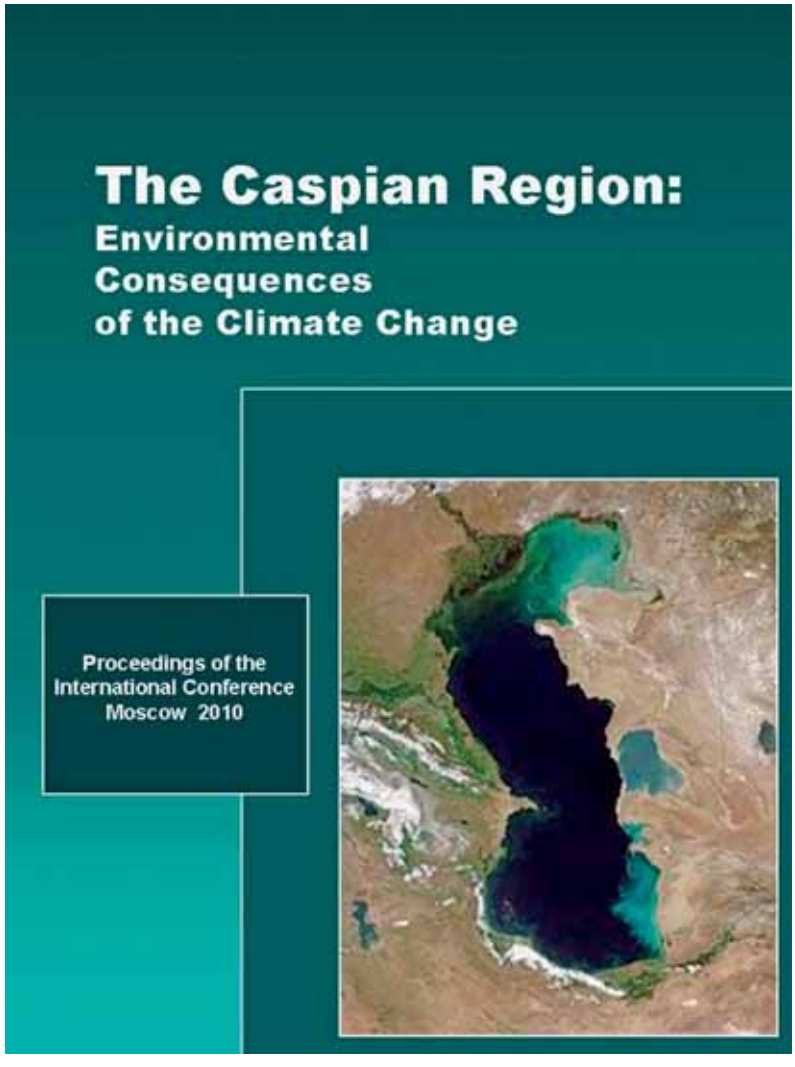
The plenary session took place on October 14th. The session was opened by the Chairman of the Organizing Committee and Dean of the Faculty of Geography of the Moscow State University, Academician N.S. Kasimov, and by the Chairman of the Scientific Committee – Professor S.B. Kroonenberg from the Delft Technological University (the Netherlands). The following leading scientists in the Caspian region research presented plenary lectures: from Russia (S. Kislov, N. Kasimov, M. Lychagin, A. Svitoch, N. Alekseevskyi), Azerbaijan (E. Alieva, R. Mamedov), the Netherlands (S. Kroonenberg, R. Hoogendoorn), Great Britain (S. Leroy) and Canada (V. Yanko-Hombach). They summarized the results of the multiannual research in the Caspian region and presented the data from the international projects IGCP, INTAS and RFBR-NWO.

On October 15th six sessions were open. The session "Palaeoclimatic and palaeoenvironmental changes in the Caspian Sea region" presented the reports on different aspects of this theme, which is fundamental for understanding the patterns of the evolution of the Caspian and its natural environments under conditions of climatic changes of variable scale and for forecasting their future development. Reports on the reconstruction of the Caspian sea-level change in the Late Pleistocene and Holocene were presented by S.B. Kroonenberg (the Netherlands), A. Kakroodi and colleagues (Iran), E. Konikov, G. Pedan (Ukraine), V. Putans (Institute of Oceanology), A. Chepalyga (Institute of Geography). The report on evaluating the runoff of the Caspian basin rivers in the same time interval was presented by A. Panin, A. Sidorchuk (MSU) and O. Borisova (Institute of Geography). Geochemical changes in the near-shore zone, caused by sea-level change were discussed in presentations by M. Kasatenkova, N. Kasimov, A. Gennadiev, M. Lychagin (MSU). An overview on the vegetation and climate evolution of the Lower Volga region was presented by N. Bolikhovskaya and N. Kasimov (MSU); on the Volga Delta by K. Richards (Great Britain) and N. Bolikhovskaya (MSU). R. Gallagher (Great Britain) presented a highly debatable view of the extraordinary Caspian sea-level rise in the Late Pleistocene that reached 155 m and reconstructed the landscape development of the Azerbaijanian coast of the Caspian and pointed to the possible link between prehistoric cultures of Egypt and Azerbaijan, referring to paleogeographic and archaeological evidence. A complex of geological, geomorphological and geophysical data was used as a basis for reconstructing the development of the Turali coast of Dagestan undertaken by E. Badukova and A. Kalashnikov (MSU). Evolution of the Iranian coastal zone under conditions of sea-level variations was presented by Iranian researchers H. Khoshravan and M. Ownegh.

The session "Evolution of the coastal zone" included reports on coastal processes, patterns of changes of the coastal landscapes, their geochemical evolution under the influence of climate change and the Caspian Sea level. In the XX century the Caspian sea-level underwent a full cycle of changes with a range of 3 m that is why researchers consider it a natural laboratory for studying fast sea-level changes and their

consequences for the near-shore zone. In the presentations the development of the coasts of Kalmykia (V. Kravtsova, S. Luk'yanova, MSU), Dagestan (S. Luk'yanova, G. Solov'eva, MSU; G. Abdurakhmanov, Makhachkala), Kazakhstan (F. Akiyanova, Kazakhstan), Iran (A. Kakroodi, Iran; S. Kroonenberg, Netherlands) was described. Comparative study of the coasts of the northern Caspian and Black seas was presented by G. Pedan and colleagues (Ukraine).

The session "Evolution of the Caspian rivers deltas" included reports on the influence of climate change and sea-level on present state and development of river deltas of the Caspian region, which is one of the most critical problems of the national economies. For the Russian part of the Caspian coast the most important is the Volga Delta – a unique natural system, playing very important role in the economy and ecology of the region. The majority of presentations were devoted to the problem of Volga Delta evolution and separate components of its environment (E. Baldina, I. Labutina, A. Kur'yakova, N. Kasimov, M. Lychagin, MSU; A. Barmin, M. Iolin, University of Astrakhan; A. Gorbunov, A. Gorbunova, Astrakhan Biosphere Reserve; P. Makkaveev, E. Vinogradova, P. Khlebopashev, T. Alekseeva, V. Svalnov, Institute of Oceanology, Moscow; Yu. Gorbunova, Kaliningrad).



The session "Current conditions of the Caspian Sea" was devoted to different problems of hydrometeorological changes in the region and their influence on the functioning of all the links in the sea system: reorganization of the thermohaline fields, vertical hydrological structure (A. Kosarev, V. Tuzhilkin, MSU; R. Nikonova, Institute of Oceanography; S. Lebedev, Geophysical Center RAS; V. Polonskyi, L. Ostroumova, Institute of Oceanography); geochemical evolution and development of marine biological communities (N. Solov'eva, Institute of Oceanology; V. Sapozhnikov, N. Zozulya, N. Mordasova, Institute of Fisheries and Oceanography, Moscow); patterns in distribution of marine sediments (H. Lahijani, Iran). B. Golubov (Institute of Geosphere Dynamics) assumed significant influence of underground waters on the Caspian Sea level.

The session "The Caspian Sea region: Environmental problems and management" included presentations covering a wide range of different aspects of ecological and geochemical state of natural complexes, caused by intensive exploration and mining of hydrocarbons in the coastal zone and on the shelf of the Caspian Sea, as well as characteristics of ecological management in these regions. The reports were presented by N. Kas'yanova (Oil and Gas University), S. Lebedev (Geophysical center RAS, Moscow). Suggestions to develop the information database on the Caspian region were given by I. Lurie, A. Alyautdinov, I. Kalinkin, V. Semin (MSU).

The session "Forecasts of the Caspian Sea level and environmental changes" included a small number of presentations on the forecast of climate change in the region, as well as response of the Caspian Sea and its natural systems to these changes. The most interest was drawn to the report of R. Klige (MSU) with the analysis of the Caspian sea-level change within historical time and its forecast for the 21st century and the report of N. Makarenko (Pulkovo Observatory), in which he and his colleagues from Kazakhstan presented mathematical models of sea-level change.

On October 16th the poster session (38 posters and their discussions) and the closing plenary session were held. The plenary session presented lectures on climate forecasts, the Caspian sea-level change (G.N. Panin, Institute of Water Problems) and the state of natural environments of the region (M. V. Moghaddam, Iran). G.I. Rychagov (MSU) made special emphasis on the characteristics of economic activity in the coastal zone under conditions of unstable level of the Caspian Sea.

At the end of the meeting there was a discussion on the presentations. All speakers received appraisal for the high presentations' level and the excellent overall conference organization. It was pointed out, that the potential for international cooperation in studying the influence of climatic changes on sea-level change and the evolution of natural environments of the entire Caspian region, accumulated within the recent twenty years, is high. Presentations, discussions, workshops, that took place shortly before and during the conference helped figuring out the future tasks - to continue the research in order to better understand the causes of sea-level change and their linkage to climatic changes at global and regional scales, and their influence on all natural environments of the Caspian region. Modern investigations in the Caspian region require close cooperation between scientists not only from Russia, but also from countries of the near and far abroad. At the closing ceremony of the conference S.B. Kroonenberg and N.S. Kasimov spoke.

As a whole, 102 reports were presented, with a total of ~ 180 participants. By the beginning of the conference the volume of abstracts: "The Caspian Region: Environmental Consequences of the Climate Change" was published as the Proceedings of the International Conference. Moscow: Faculty of Geography, 2010. 352 p. (http://media.geogr.msu.ru/Caspian_2010/caspian_conference_2010.pdf)

Tamara A. Yanina, the Executive Secretary of the Conference