

## ADVANCED ST. PETERSBURG STATEMENT ON THE ARAL SEA

### Introductory information (preamble)

The Second International Conference on the problems of the Aral Sea was held in St. Petersburg, Russia, from November 15 to November 18, 2019. The Conference was organized following a resolution of the Eighth Nevsky Ecological Congress held on May 25-27, 2017. Its final resolution stated:

“In the field of environmental safety of the Aral Sea:

- to develop specialized educational and enlightening programs for primary, secondary and higher educational institutions under the jurisdiction of the states participating in the activities of the International Fund for Saving the Aral Sea;
- to hold in St. Petersburg the second International Conference on the problems of the Aral Sea;
- to assess the current environmental problems of the Aral Sea and the Aral Sea region;
- to develop, taking into account the best available technologies, a set of measures aimed at the conservation and rehabilitation of residual water bodies of the Aral Sea, under the auspices of the International Fund for Saving the Aral Sea.”

The conference was attended by scientists from 9 countries: Russia, Kazakhstan, Uzbekistan, the United Kingdom of Great Britain and Northern Ireland, France, USA, Japan, Poland and Spain.

Russia was represented by eight speakers.

Two of those speakers were from Moscow:

1. Novikova Nina Maksimovna, Professor, Doctor of geographical sciences, Water Problems Institute of the Russian Academy of Sciences. She and her co-authors presented a report on “Monitoring the evolution of natural complexes in the southern Aral Sea region”.
2. Konyushkova Maria Valerievna, Senior Research Scientist, candidate of agricultural sciences, Eurasian Center for Food Security, Moscow State University. She and her co-authors presented a report on “Soil salinization monitoring using remote sensing data on agricultural lands of the Aral Sea region”.

The other six Russian speakers were from St. Petersburg:

1. Aladin Nikolai Vasil’evich, Professor, Doctor of biological sciences, Head of the Laboratory of Brackish Water Research, Zoological Institute of the Russian Academy of Sciences. He, and co-authors from the Laboratory, presented a report on “Aral disaster in the literal and figurative sense of the word”.
2. Plotnikov Igor Svetozarovich, Candidate of biological sciences, Senior Researcher at the Laboratory of Brackish Water Research, Zoological Institute of the Russian Academy of Sciences. He made a presentation on “Changing in the species composition of free-living aquatic invertebrates of the Aral Sea”, based on material from his ongoing doctoral dissertation.
3. Zhakova Lubov Vasil’evna, Junior Researcher, Laboratory of Brackish Water Research, Zoological Institute of the Russian Academy of Sciences. She made a presentation on “Impact of long-term changes in the salinity of the Aral Sea on biodiversity in communities of aquatic macrophytes” based on material from her ongoing Ph.D. thesis.
4. Lisovskiy Sergey Anatol’evich, Editor-in-chief of the newspaper “Society and Ecology”. He presented a report on “Aral Sea in dreams and in reality”.
5. Smurov Alexey Olegovich, Candidate of biological sciences, Senior Researcher at the Laboratory of Brackish Water Research, Zoological Institute of the Russian Academy of Sciences. He and his co-authors from the Laboratory and one (1) co-author from Germany, presented a report on “Salinity tolerance of hydrobionts in thalassic and athalassic water reservoirs”.

6. Pankratova Irina Viktorovna, Candidate of biological sciences, Herzen State Pedagogical University of Russia. She made a presentation on “Scientific Research of the Herzen State Pedagogical University of Russia on Barsakelmes (BKGZ)”.

From Kazakhstan two speakers made presentations.

1. Bekniyaz Bolat Kabykenovich, Doctor of geographical sciences, International Fund for saving the Aral Sea, Director of Executive Board of the Republic of Kazakhstan, Almaty. He presented a report on “Proposals for improving the environmental conditions of the Aral Sea and the Aral Sea region”.
2. Alimbetova Zauresh Zhansultanovna, Director of the Barsakelmes State Nature Reserve, Aralsk. She presented a report on “Barsakelmes State Natural Reserve”.

There was one speaker from Uzbekistan.

Odilbek Islamovich Eshchanov, leading environmental specialist, Scientific-Information Center of the Interstate Coordination Water Commission, Tashkent. He, in collaboration with Dukhovny Viktor Abramovich, Director of the Scientific-Information Center of the Interstate Coordination Water Commission, made a report on “Aral and Aral Sea region – a little of the history and a lot about the future”.

There was one speaker from the United Kingdom.

Gallagher Ronald, former head of the Environmental Department of British Petroleum in Azerbaijan. He gave a lecture on “Strandlines on Azerbaijan's Mud Volcanoes and coastal interior: New evidence of a catastrophic marine flood impacting the Ponto Caspian and Aral Sea regions with its implications to natural sciences and humankind”.

There was one speaker from the United States.

White Kristopher, currently teaching at KIMEP University, Almaty, Kazakhstan. He presented a report on “Ecological and economic recovery of Kazakhstan's Northern Aral Sea”.

One speaker from France made a presentation.

Cretaux Jean-Francois, Legos/CNES, Toulouse. He presented a report on “Lakes in Central Asia, survey from satellite remote sensing”.

There was one speaker from Japan.

Chida Tetsuro, Associate Professor, School of Global Management and Cooperation, Nagoya University of Foreign Studies, presented a report on “Further measures for the sustainable socio-economic development of the Aralsk district”.

There were two speakers from Poland.

Klimaszyk Piotr, Head of Department of Water Protection, Adam Mickiewicz University, Poznań, and Marszelewski Włodzimierz, Head of Department of Hydrology and Water Management, Nicolaus Copernicus University, Toruń. They, together with their co-workers, reported on “Differentiation of biotopes and biocoenoses of Small Aral Sea and lower course of Syr Darya River – Spring survey in 2018”.

There was one speaker from Spain.

Alonso Garcia-Amilibia Miguel, University of Barcelona, presented a report on “Limnological studies of the salt lakes in Mongolia are important for rehabilitation projects of the Aral Sea”.

In addition to the speakers, three observers participated from Russia, Uzbekistan and Azerbaijan.

Meshcheryakova Natalia Sergeevna, Russian company “Support for GOOD IDEAS” Open social and humanitarian communications. She expressed the desire for further productive work and achievements, to draw further world and domestic attention to the topics of studying, preserving, restoring fragile balances in the natural world for the benefit of sustainable development and effective cooperation, as an invariable connection of challenges and actions. She pointed out that there is a need to make new reliable and scientifically accurate documentary films and TV programs about the Aral Sea and Aral region and associated problems, paying special attention to the success achieved by international teams of scientists. She also

congratulated the scientific team of the Laboratory of Brackish Water Research on the 30th anniversary of its foundation in the Zoological Institute of the Russian Academy of Sciences

Mamadzhanova Gulsanam Sandzharovna from Uzbekistan, author and Director of the International Innovation Project “Revived Aral” (2004), made an appeal to unite the creative and scientific forces of the international community of states in the revival of the Aral Sea; about the need to change the world view and value orientations related to the consciousness of the natural environment; about the importance of a positive approach in producing new works of art and culture, through the process of creative transformation of reality. She also spoke about the activities of the International Women's Public Fund “Woman of the East”. Congratulations were offered to the scientific team of the Laboratory of Brackish Water Research on the 30th anniversary of its foundation in the Zoological Institute of the Russian Academy of Sciences.

Almaz-Hanum Medzhidova, Azerbaijan, head of the International Cultural and Educational, Ecological and Educational Center “AZERI”, accredited member of the International Women's Public Fund "Sharq Ayoli" (Woman of the East). She called for the creation of new scientific knowledge for the development of new innovative projects for the Aral and Aral Sea region. She also talked about the activities of the International Cultural and Educational Center “AZERI” and asked to combine the efforts of scientists, artist and cultural persons in the faster rehabilitation of the remnants of the Aral Sea and the phyto-reclamation of the dried bottom of the Aral Sea. Congratulations were offered to the scientific team of the Laboratory of Brackish Water Research on the 30th anniversary of its foundation in the Zoological Institute of the Russian Academy of Sciences.

The statement below is based on presentations made at the conference, discussions, suggestions and comments of conference participants and experts not participating in the conference. The statement was prepared in the image and likeness of the statement a decade ago, which was adopted after the First International Conference on the Aral Sea from October 12 to 15, 2009.

### **Statement**

1. The Aral Sea – a large closed lake located in the deserts of central Asia, has undergone an unprecedented reduction in size and salinization over the past 60 years. This has had a strong negative environmental impact on the lake and the deltas of the two inflowing rivers. The population of the territories adjacent to the lake has also experienced the negative consequences of lake degradation, which led to deterioration of the environment, the emergence of conditions unfavorable to human health, the destruction of the economy of the surrounding areas, as well as social and cultural disconnection.
2. In order to adequately assess the modern lake regression that occurred since 1960, it is necessary to understand that the lake has repeatedly changed its level over the past 10,000 years. This was due to natural climate change, repeated displacements of the channels of the Syr Darya and Amu Darya rivers feeding the lake and the redirection of their flow from the Aral Sea to the Caspian Sea or simply to the desert, as well as the development of intensive irrigation systems for agriculture in the basin over the past 4000 years.
3. The current regression observed since 1960 differs from the previous ones. For the first time, irrigation was the dominant regression factor, more significant than the deviation of the Amu Darya course from the lake. This resulted in the drying out of the lake, which is the most significant event, at least in the last few thousand years. The main factor that led to the recent drying of the Aral Sea was an increase in the use of river water for irrigation in the lake basin between the mid-1950s and mid-1980s, which significantly exceeded the permissible water use threshold for sustainable development, causing a significant reduction in river inflow into the lake. The second most important cause of this phenomenon was natural climatic cycles. Global warming in recent decades has begun to affect the water balance of the Aral Sea and

- is predicted to become an important factor in the future; however, to date, it has not been the main reason for the drying of the Aral Sea.
4. The redirection of Siberian rivers southwards to the Aral Sea basin or pumping water from the Caspian Sea to the Aral Sea, are unrealistic measures to solve the water problems of Central Asia. Such measures would be too expensive and complicated; they would require the development and adoption of international agreements and would have many potentially serious environmental consequences. It would be more reasonable to direct efforts towards developing local and regional solutions to these key issues, such as improving the efficiency of water use for irrigation and taking measures to preserve and partially restore the remaining parts of the Aral Sea. However, according to conference participants from Uzbekistan, diverting some of the water from Siberian rivers south to the Aral Sea basin should be discussed again in scientific and political circles. This should be done not only to redistribute the flow of Siberian rivers in favor of the Aral Sea basin, but also to preserve the Arctic ice. The rapid melting of Arctic ice and the exacerbation of methane emissions from underwater permafrost can be slowed down if part of the flow of Siberian rivers is directed to the Aral Sea basin or similar landlocked basins. Speakers from Uzbekistan (Dukhovny V.A. and Eshchanov O.I., SIC ICWC) cited data from specialists of the Siberian Branch of the Russian Academy of Sciences, according to whom, under the influence of climate change, the water content of Siberian rivers flowing into the Arctic Ocean increases by 150-200 cubic kilometers per year. In their opinion, diversion of part of the flow of Siberian rivers to the Aral Sea basin may have a positive effect on the restoration of Arctic ice and will have a beneficial effect on the water resources of the Aral Sea region, which, according to the Uzbek participants of the conference, may be exhausted by 2030-2045.
  5. The flow of the Amu Darya and Syr Darya rivers is a key factor determining the size of the lake and its ecological state. Therefore, it is imperative to ensure appropriate management of the water resources of the Aral Sea basin. This requires cooperation and joint work of states located on the territory of the Aral Sea basin in order to solve important problems of water resources management, including issues of water sharing and conflicts that arise between countries located in the upper and lower reaches of the rivers over the need for irrigation, and in relation to maximizing hydropower generation. The most important measure is the introduction of modern technologies and methods of irrigated agriculture and in particular drip irrigation that ensures a more rational use of water resources, as part of the program for the reconstruction of outdated inefficient irrigation systems. This would lead to a decrease in water withdrawal by countries located in the Aral Sea basin and would contribute to the restoration of the unique biota of this lake. Actions are required to implement agricultural reform and rational water use at all levels of government and society in Central Asian countries – from individual users to decision makers. Specialists, as well as social and environmental organizations, associations and groups of activists can be involved in this process. It is necessary to continue even more actively phyto-melioration of the former bottom of the Aral Sea in order to prevent dust and salt storms and improve climatic conditions in the Aral Sea region. There is a proposal from Consumer Society “Ecopolis” to implement an ecological project on planting fast-growing tree plantations fast-growing tree *Paulownia* within the Aral basin, where beekeeping and cultivation of other crops could be possible also. However, it is necessary to work out preliminarily a question on the ecology of this species – how much this tree is salt and frost resistant. It is assumed that in the arid climate it is possible to solve the problem of irrigation in oases by using the Israeli technique to generate water from the ambient air and drip irrigation technologies. But for phyto-reclamation of the former bottom of the Aral Sea, this project is unlikely to be applicable because of the strong salinity and the almost complete absence of suitable soils.
  6. The study of the Aral Sea has a long and rich history, beginning in the middle of the 19<sup>th</sup> century. Museums, archives and institutes in St. Petersburg are storing and presenting materials and items of expeditions to scientists and a wide range of people interested in the

problem of Aral Sea. A large number of thorough scientific studies of high quality were carried out during the time of the Russian Empire and in the Soviet Union, resulting in many excellent scientific publications. Modern researchers should not ignore the valuable scientific contribution made during these periods and not neglect the successful international developments and practices in the Aral Sea.

7. Reports of the death of the Aral Sea are premature. Although the Aral Sea of the 1960s will not exist in the foreseeable future, significant parts of this lake have survived. Brackish-water ecosystem of the Small (North) Aral Sea has been partially (and very successfully) restored, so that it again has important environmental and socio-economic importance. Although the eastern basin of the Large Aral Sea has been lost, its western basin can be partially preserved and restored if studies show that it is economically and environmentally feasible. The efforts to protect and preserve parts of the Syr Darya and Amu Darya deltas are bringing positive results.
8. It is important to develop an updated scientific approach to the study of the Aral Sea, river deltas and the entire region, maintain a balance of theoretical and applied research, as well as strengthen the cooperation of scientists being specialists in various disciplines from as many countries as possible with the International Fund for Saving the Aral Sea (IFAS), and with other organizations involved in solving the problems of the Aral Sea and Aral Sea region. Special efforts must be made to attract young scientists and researchers to ensure continued scientific participation and international dialogue.
9. It is proposed to create the International Committee of Intellectual Solidarity with the Aral Sea (ICISwAS). Its task should be to develop a comprehensive assessment of the ecosystems of the lake and the directly adjacent zone (especially the deltas of the two inflowing rivers). The committee will have to carefully consider ideas for improving the situation in the Aral Sea and Aral region, and develop new innovative projects, both for the former sea bottom and for the remaining water bodies that have emerged after the dramatic drop in water levels in the Aral Sea. The committee will have to carefully consider ideas for improving the status of the Aral Sea and in the Aral Sea region, develop new innovative projects, both for the former bottom and for the residual water bodies that have created that are the result of a sharp drop in water level in the Aral Sea. ICISwAS will coordinate its activities and cooperate with the existing IFAS in order to avoid duplication of efforts, ensure the most effective use of international donor funds and avoid interference with the important work of this organization. Such a committee should include scientists from different countries – specialists in various relevant disciplines, including (but not limited to) the following: limnology, ecology of terrestrial ecosystems, geography, geology, botany, zoology, ichthyology, ornithology, hydrology, agronomy, geology, soil science, meteorology, historical sciences (anthropology, archeology, history), sociology/demography, medicine and economics. It is very important to include GIS Center in Nukus, local politicians and administration representatives, as well as representatives of public organizations, such as non-governmental organizations, and other responsible persons in such a committee. A research team should also be established to include experts from the Aral Sea region to implement a long-term scientific master plan. Since many useful and relevant raw data are difficult to access (for example, in the form of information recorded on cards or in registration books), coordinated efforts are needed to convert such data into an easily accessible digital format which could then be disseminated for scientific and awareness purposes using modern tools and media. This will facilitate access to data and make it possible for more specialists worldwide to participate, facilitate popularization and education, and simplify access for economic, managerial and social interactions. The ICISwAS will also have to coordinate its activities and cooperate with the Trust Fund for the Aral Sea region, which was recently created under the auspices of the United Nations. The conference participants called for the creation of special programs for the implementation of ecological monitoring and sustainable development goals in the Aral Sea region, which will return

optimism to the local population and restore decent living conditions. Today it is impossible to provide a solution to the problems facing us without the development of effective scientific cooperation. In this regard, we consider it important to organize joint interdisciplinary research, including at the site of Scientific and Information Centers of the Interstate Coordination Water Commission (SIC ICWC) and the Interstate Commission for Sustainable Development (ICSD). Sustainable development, security and prosperity should be the leading elements of this enhanced interstate strategic cooperation “beyond the water”. The main principle of creating this platform is that collective efforts will yield more productive results than national activities that are being scaled up but scattered. Currently, proposals have been prepared and related work is underway to create a Central Asian expert platform based on the SIC. Together with the establishment of ICISwAS, it is necessary to support the proposal to establish a Central Asian expert platform on the basis of SIC ICWC and SIC ICSD. Moreover, SIC ICWC and SIC ICSD are part of IFAS.

10. All participants in this conference, both speakers and observers, noted the important role not only of the scientists, but also of art and culture workers, in the preservation and rehabilitation of the Aral Sea and Aral Sea region. Sensitive and rational ways of knowing the consequences of an environmental catastrophe in the Aral Sea and in the Aral Sea region complement each other and serve to achieve a better future for the Aral Sea and all peoples of the Aral Sea region as soon as possible. Creation of new works of art and culture, both professional or for use with mass media, documentaries or modern creative synthetic educational products, preferably with the use of modern digital capabilities and aimed at prospective development, which are devoted to the Aral and Aral Sea region, we strongly welcome and fully support. New literary, artistic and other works are needed which will be devoted to the Aral Sea and the Aral Sea region. It is necessary to support creation of new poems, songs, paintings, plays, films, television shows, internet sites and many other things to attract attention to the problems of the Aral Sea and Aral Sea region by the masters of art and culture in order to solve them as soon as possible. It is important to hold thematic literary, song, theater, film and television festivals. Development of tourism on the banks of the Aral Sea and in the Aral Sea region has great potential. It should not be spontaneous. Instead there needs to be a system of international interaction and appropriate infrastructure, ensuring that tourism can be adventurous, but must have a historical, natural-scientific character. Such tourism will increase the employment of the population, give it a supplement professional activity to support job and income security and will have commercial and informational attractiveness. Only the joint efforts of workers in science, art, culture and the tourism industry will allow us to successfully fulfill these very important development objectives that are now being successfully developed and implemented for the Aral Sea and in the Aral Sea region.

We, the participants of the Second International Conference on the Problems of the Aral Sea, appeal to politicians, representatives of science, art, culture, business, civil society and journalists to actively contribute to the implementation of the ideas contained in this Statement. We invite them to contribute to the dissemination of the positive experience of international cooperation, to contribute to the creation and implementation of programs, projects and decisions aimed at improving the natural environment, welfare and economic life, in order to implement a successful model of sustainable development of global proportions. We also propose that March 26<sup>th</sup> each year should be dedicated and celebrated as “*Aral Sea Day*”. In addition, we propose to hold a period of dedicated events for the Aral Sea named “*Aral Days*” during the second semester of every year starting with 2020.