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Arctic Science Diplomacy: With or Without Russia?

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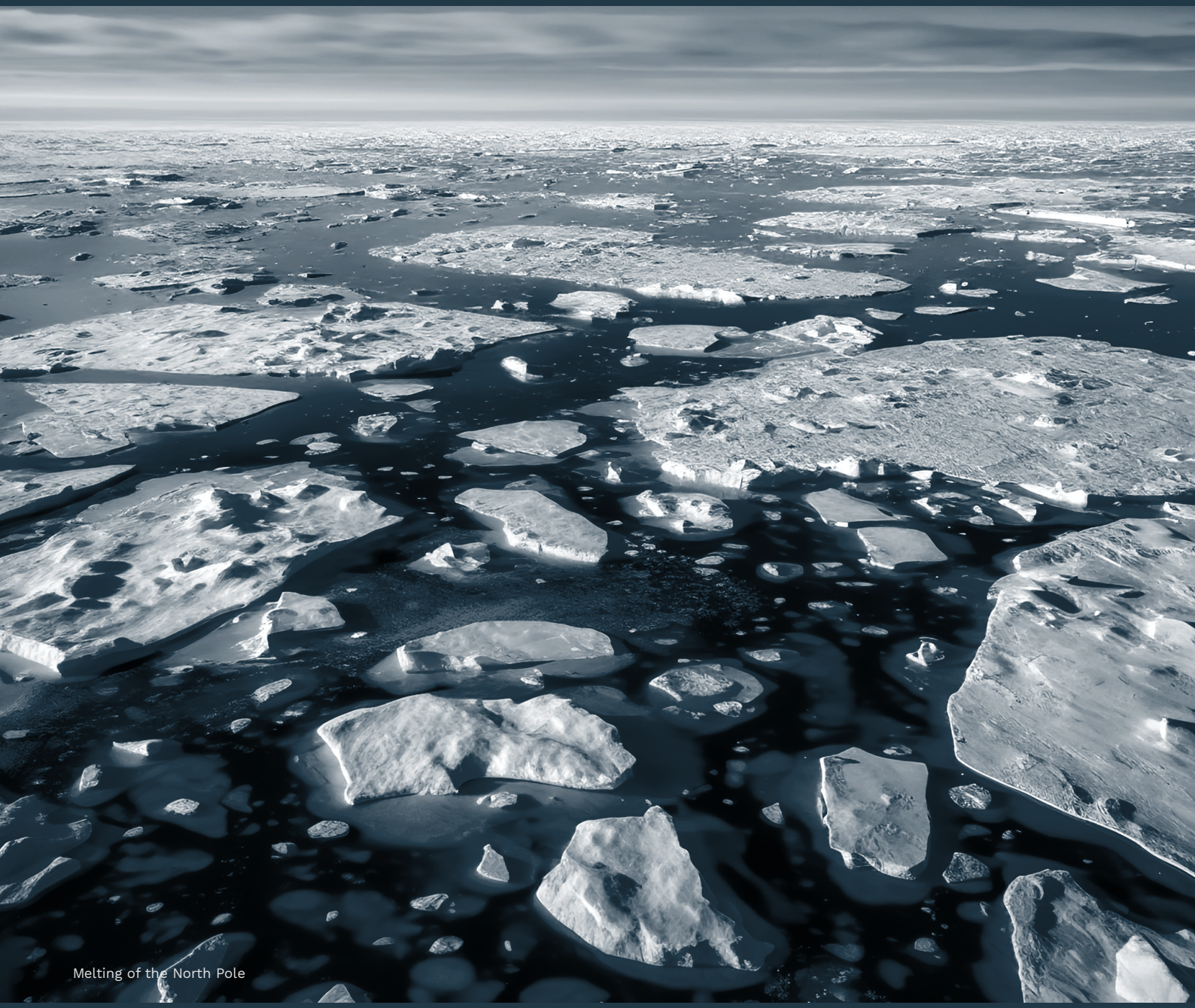

Melting of the North Pole

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Key points

- The phenomenon of science diplomacy manifests itself in the interplay between scientists and decision-makers at the national and international levels. On one hand, science offers its rationale for political decisions, and on the other, states and international organisations promote scientific research of global significance.
- Science diplomacy and scientific research are particularly important in the Arctic, where political-economic decisions should be based on accurate and comprehensive knowledge.
- Influenced by the Ukraine crisis, international governance in the Arctic has come to a standstill because the Arctic states have suspended cooperation with Russia.
- International relations have demonstrated a tendency to divide Arctic stakeholders into two camps: (1) Russia plus China and other states that did not support the sanctions imposed on Russia for its attack on Ukraine, and (2) NATO-oriented states.
- Isolating Russia will not help to solve current global problems, including climate change, melting ice, thawing permafrost, and ocean acidification, nor advance environmental protection and biodiversity conservation. These issues must be addressed regardless of the outcome of the crisis in Ukraine.
- The most promising approaches for Arctic scientific cooperation with Russia are infrastructural scientific projects, fundamental and applied research, data collection and exchange, and the development of environmentally friendly technologies.
- As a concept that fundamentally links science and technology with international relations, science diplomacy can provide a bridge to renewed limited cooperation with Russia in the Arctic.

Introduction

The development of new technologies has played a role in depleting natural resources and degrading the environment. As a result, the importance of taking knowledge-based political and economic decisions in line with the concept of sustainable development is growing. In the Arctic, science-based decision-making is crucial because:

- Arctic ecosystems are particularly vulnerable to economic activities;
- no state has sufficient financial, technological, nor human resources to explore and develop the Arctic alone;
- the Arctic is sparsely populated and remote from industrial centres; and
- researching the global trends emanating from the Arctic is impossible without international scientific cooperation.

To overcome the deadlock, science diplomacy can create a "bridge" for finding a reasonable compromise in Arctic policy, despite the Ukraine crisis.

According to this view, the Arctic should be considered an exceptional "zone of peace and cooperation",[1] but this exceptional status was lost after the beginning of Russia's military operation in Ukraine in February 2022. Finland's accession to NATO and Sweden's ongoing application have radically changed the strategic environment and increased the risk of military confrontation. There seems to be a tendency to divide Arctic stakeholders into two roughly equal groups: the NATO-oriented states on one side, and Russia plus China and other states that did not support the sanctions imposed on Russia after its attack on Ukraine.

The West has indefinitely paused cooperation with Russia in the Arctic Council (AC), thereby provoking a political stalemate. Norway's chairmanship of the AC during 2023-2025 does not promise any reconciliation, because its agenda does not even mention the Ukraine crisis.[2] To overcome the deadlock, science diplomacy can create a "bridge" for finding a reasonable compromise in Arctic policy, despite the Ukraine crisis. Science diplomacy played this role during the Cold War by supporting various types of dialogue between the United States and the Soviet Union. In the current situation it could also improve international relations and support multilateral efforts to address common problems, including climate change, in the Arctic.[3]

Definition, functions and forms of science diplomacy

Science diplomacy means the interaction of diplomacy and science in international relations in order to influence decision-makers. Science diplomacy is based on international scientific and technical cooperation for all countries' mutual benefit. It helps to develop common rules and to balance stakeholders' interests.[4]

Science diplomacy can take three basic forms. *Science within diplomacy* occurs when scientists give advice to government officials to make science-based decisions. *Diplomacy for science* refers to diplomacy supporting scientific research of global importance. *Science for diplomacy* corresponds to situations when scientific cooperation helps to build trust in international relations.[5]

In practice, science diplomacy can take many forms that create the conditions for cooperation free from political determinism.[6] As a political instrument, science diplomacy refers to soft power resources promoting an attractive image of a state. Science diplomacy may be treated as part of public diplomacy, and, in the current context, could mitigate the deterioration of relations between Russia and the West.[7]

Traditional forms of science diplomacy include joint research and data exchange between scientists from different countries; inviting researchers to exchange experience; communicating with foreign partners; the discussion of results with and their dissemination to foreign partners; joint publications; joint use of scientific infrastructure, instruments, equipment and platforms; joint expeditions; the development of science-based recommendations for decision-makers; providing information and expert support for political negotiations; and the promotion of international scientific cooperation by governmental organisations and NGOs.

Science diplomacy particularly benefits the policies of non-Arctic states, because cooperation with AC working groups is the only way to increase their political influence in the AC.[8] If non-Arctic states (such as France, Germany, Japan, Switzerland and the UK) are skilled in soft power projection, they can significantly strengthen their positions and achieve the status of AC observers. For example, through its scientific activities and the establishment of the Polar Institute, Switzerland has achieved AC observer status.[9] Equally, through science diplomacy China is seeking the right to participate in the global governance of the Arctic and to gain access to Arctic resources and sea routes.[10] AC member states have to take the views of non-Arctic states into account in their decision-making processes. No wonder that the concept of science diplomacy is widely referred to in the official foreign policy documents of many states.

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Arctic science diplomacy mechanisms at the global, state and local levels

Institutionally, Arctic science diplomacy encompasses numerous forums, associations, international and governmental organisations, and NGOs interacting at the global, international, and local levels.

At the global level the United Nations (UN) is a universal platform for science diplomacy. It promotes sustainable development projects through global protocols as products of science diplomacy: the Montreal and Kyoto Protocols, the UN Framework Convention on Climate Change, etc. Other important structures supporting Arctic science diplomacy include the UN Environment Programme; the UN Educational, Scientific and Cultural Organisation (UNESCO) and its Intergovernmental Oceanographic Commission (IOC); and the World Meteorological Organization (WMO).

The Intergovernmental Panel on Climate Change (IPCC) was established under the auspices of the UN and WMO. It provides decision-makers with expert knowledge that they can use to discuss the problems of climate change, related risks, and options for adapting to the negative impacts of climate change. The International Council for Science (ICS) has UNESCO status and is an international NGO of more than 230 international associations representing the natural, social, and human sciences. The ICS views science as a global public good for the benefit of humankind.

Many global organisations and programmes are linked through both organisational and financial mechanisms. The programme of the 4th International Polar Year (2007) was financed by the Scientific Committee on Antarctic Research, the Association of Young Polar Scientists, the ICS and the WMO. The IOC and UNESCO launched the global UN Decade of Ocean Science for Sustainable Development 2021-2030,[11] which aims to create a wide-ranging dialogue to preserve the Arctic Ocean as a part of the world's oceans.

At the intergovernmental level, the AC serves as the central body for Arctic science diplomacy. It is a high-level intergovernmental forum that addresses

issues facing the Arctic states and indigenous peoples living in the Arctic region. The structure of the AC includes working groups that provide science-based recommendations to decision-makers. Decisions of the AC are the exclusive right and responsibility of the eight Arctic states acting in cooperation with state observers, as well as with intergovernmental and interparliamentary organisations and NGOs.

The United States created a new mechanism when it initiated regular meetings (2016, 2018, 2021) of science ministers of states involved in Arctic research. The meetings have discussed measures to expand international cooperation, develop a global observation system, organise the exchange of observation data and discuss the sustainable development of the Arctic.

At the international non-state level, the most important forum is the International Arctic Science Committee (IASC), which includes representatives from 24 countries. Five IASC working groups conduct research in atmospheric, cryosphere, marine, terrestrial and social sciences. Emphasising an interdisciplinary approach, these groups advise the IASC Council when it formulates research agendas for Arctic studies.

The common interest of states to develop international scientific cooperation led to the signing of the 2017 Agreement on Enhancing International Arctic Scientific Cooperation.

The International Arctic Social Sciences Association (IASSA)[12] promotes international cooperation in the social and health sciences, humanities, and fine arts. It facilitates research and educational partnerships with indigenous peoples and other inhabitants of the Arctic, and encourages the establishment of informal international working groups such as Justice in the Arctic, Gender in the Arctic, and Extractive Industries in the Arctic.

The University of the Arctic (UArctic)[13] is an international non-profit network organisation engaged in scientific and educational activities. Its offices are located in 200 organisations in the countries involved in formulating Arctic-related policies. The UArctic focuses on mobility, exchange, and cooperation among scientists from different countries, and the development of joint educational programmes. The IASC and UArctic are observers to the AC. Global Arctic, the Calotte Academy and the Northern Research Forum are other examples of network-type platforms.

At the local level, science diplomacy is implemented through development strategies for the Arctic regions and the activities of various organisations. For example, the Saami Council promotes the rights and interests of the Saami people in four countries: Finland, Norway, Russia and Sweden. Global Arctic, the Calotte Academy and the Northern Research Forum contribute to linking local and global science diplomacy agendas.[14] The RAIPON organisation represents the interests of 40 indigenous peoples living in Russia's Arctic and Far East regions[15] and is a permanent member of the AC.

To date, cooperation has been most effective at the interstate level due to the AC's status. The common interest of states to develop international scientific cooperation led to the signing of the 2017 Agreement on Enhancing International Arctic Scientific Cooperation.[16] This document requires signatory states to take mutual measures to remove various bureaucratic barriers to international cooperation, the exchange of scientific data and experience, and the development of education and cooperation between Arctic and non-Arctic states.

Instruments of Russia's Arctic science diplomacy

Russia has the largest polar territories, and impressive scientific experience and infrastructure in the Arctic.

State organisations. The State Commission on the Development of the Arctic[17] is the main federal-level body coordinating liaison between executive authorities and scientific research in the Russian Federation's Arctic zone. The Government Commission for Ensuring the Russian Presence in the Spitsbergen (Svalbard) Archipelago[18] is more specifically responsible for strategic issues. It includes representatives of ministries, scientific and educational institutions, and a special presidential envoy for international cooperation in the Arctic and Antarctic. The Commission's Supervisory Board controls the activities of the Russian Scientific Centre on the Spitsbergen Archipelago in terms of the archipelago itself, the shelf and the Arctic Ocean.[19]

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Hybrid organisations. Hybrid bodies combine the functions of state and scientific institutions. The Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet) provides state meteorological services and conducts its own international projects. Roshydromet is a member of the WMO, the UN Framework Convention on Climate Change, the IPCC, and the International Programme for Arctic Monitoring and Assessment of the Arctic Environment.[20]

Scientific and educational organisations. The Arctic and Antarctic Research Institute (AARI)[21] conducts fieldwork, data processing, mapping, modelling, and forecasting on the climate, atmospheric processes, near space, and the marine and ice environments. AARI scientists work at Severnaya Zemlya (Cape Baranov Ice Base), Tiksi Bay and the Spitsbergen Archipelago.

The Russian State Hydrometeorological University explores ozone anomalies in the polar regions, changes in atmospheric gases, and events in the stratosphere, and conducts satellite monitoring of the sea ice. The project "Startup Barents" was launched to create a unified international network for data exchange.[22]

The Northern Arctic Federal University (SAFU) supports partnerships with universities of the Arctic states, the Republic of Korea and China. SAFU participates in the work of UArctic and the Education and Science Working Groups of the Barents Euro-Arctic Council and other networks. The university is involved in projects on Arctic biomonitoring, ecological security, green energy, information technology and the preservation of the Arctic's cultural heritage.[23]

Saint-Petersburg State University (SPbGU) has extensive international ties and conducts research on Arctic ecology, the dynamics of geological changes, the use of subsoil, the regulation of navigation, and human security and political issues. A distinctive feature of the SPbGU is its interdisciplinary projects, including the sustainable development of Arctic cities, and challenges around socio-economic development in the face of climate change. The Arctic Research Centre was established to coordinate international cooperation in these and other relevant areas.[24]

The Kola Science Centre (Russian Academy of Sciences) has the status of a federal research centre. It is the only scientific institution in Russia located above the Arctic Circle. It has 30 international partners and participated in the Kolarctic, ARCSUS, VOLRUSS, NEO-BEAR, and MARP projects. The Centre focuses on environmentally friendly technologies, the evaluation of geobiological risks, the preservation of natural biodiversity, cross-border cooperation in railway transport, and the biotechnologies used to control oil

spills. The Centre's Institute of Economic Problems explores the sustainable development of Arctic cities and indigenous peoples, maritime activities, and resource management.[25]

Challenges for science diplomacy in the Arctic

Challenges to science diplomacy in the Arctic are related to national security issues. The militarisation of the Russian Federation's Arctic zone and the US state of Alaska explains why access to these parts of the Arctic is limited or even closed. But the other Arctic littoral states impose similar policies and restrict access to scientific data such as permafrost thawing dynamics and pollution parameters.[26]

National jurisdiction over Arctic spaces creates another barrier to science diplomacy, e.g. procedures related to visas and permits for foreign scientists to transport equipment and samples across national borders. These procedures can take several months, especially when political disputes between states escalate. The 2017 Agreement on Enhancing International Arctic Scientific Cooperation helps to overcome these difficulties.[27]

Science diplomacy can lead to the exacerbation of political contradictions related to the sovereign rights of states. Such risks are higher between Arctic and non-Arctic states due to their different legal status. Non-Arctic states can only increase their influence through scientific activities and science diplomacy, but this may not suit all participants in Arctic politics. For example, when China proposed building a permanent research station in Greenland in 2017 it provoked a negative reaction from Denmark and the United States.[28]

After the start of Russia's military operation in Ukraine there was a spill-over effect of enmity in the Arctic. Scientific cooperation with Russia was suspended in most regional international organisations.[29] The process of implementing the 2017 Agreement was also stopped.

From the Russian point of view, these steps were highly politicised because they do not meet the norms of international law. The activities of the AC and the 2017 Agreement are not affected by the outbreak of a military conflict, while the AC charter clearly excludes any military-related issues. The 2017 Agreement also does not provide an explicit provision for its termination, withdrawal, or suspension because of armed conflict or heightened political tensions. According to the 1969 Vienna Convention on the Law of Treaties and the draft articles on the effects of armed conflicts on treaties adopted by the UN International Law Commission (arts. 3, 6, 7 and 15),[30] the 2017 Agreement should be considered as an active treaty even during an armed conflict. Because it is treaty based, Arctic scientific cooperation in general is quite resilient even in the face of aggression by an Arctic state. Some Finnish and Japanese experts believe these arguments to still be applicable.[31]

After the suspension of scientific cooperation with Russia, the non-Arctic states face difficulties, because they can only implement their scientific projects through AC working groups that are facilitated by the Arctic states. Since it is extremely difficult to resume scientific cooperation at the state level, the only remaining niche is between scientific organisations and individual scientists.

In practice the sanctions imposed on scientific cooperation with Russia have negative implications for the future of scientific cooperation in the Arctic, especially in areas related to climate change. This is in the interests of neither the Arctic nor non-Arctic states, including Brazil, China and India. Some of

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them, such as Japan and the Republic of Korea, joined the sanctions under strong pressure from the United States.[32] It is also noteworthy that sanctions have caused controversial reactions among some scientists directly involved in international cooperation in the Arctic.[33]

Various scenarios for the future were discussed at the expert level in light of the end of Russia's chairmanship of the AC in 2023. There is still no clear understanding of the future global governance mechanism in the Arctic. Norway's plan for the chairmanship of the AC (2023-2025) indicates no intention to resume cooperation with Russia. In response, Russia officially announced that it will emphasise bilateral relations in the Arctic. It also intends to extend activity on the Spitsbergen Archipelago through the BRICS forum.[34] In the G-20 forum India has offered itself as a mediator in the dialogue between the West and Russia,[35] which would allow the G-20 to contribute to cooperation with Russia in the Arctic. However, even if the Indian initiative is successful, it is unlikely to change the West's position.

There is still no clear understanding of the future global governance mechanism in the Arctic.

Prospects for scientific cooperation with Russia

The prospects for Arctic science diplomacy are linked to projects of global significance: climate change, melting ice, thawing permafrost, ocean acidification, environmental degradation and the loss of biodiversity. All these processes are transboundary in nature. To continue studying them without Russia is objectively impossible, because in order to build mathematical models that accurately describe global processes, it is necessary to regularly receive and accumulate data from sensors distributed throughout the Arctic. The fact that Russia occupies almost half of the Arctic space is an obvious reason why scientists advocate a return to scientific cooperation with that country.

The first approach to possible scientific cooperation with Russia is through scientific infrastructure projects, for example the Snowflake international Arctic station on the Yamal Peninsula, which is manned all year round. The station will use renewable energy sources and hydrogen fuel, so its power unit will be environmentally clean. The AC working group on sustainable development approved the project.

Scientists can use the Snowflake station to study climate change and the evolution of permafrost, and to develop technologies for Arctic medicine, carbon-free energy, transportation, robotic complexes, and biotechnology. While cooperation on Snowflake in the AC working groups has been suspended, governments and companies from China, India, Norway, South Korea and the United Arab Emirates are showing interest in the project.[36]

Floating platforms for scientific and educational activities are of interest to potential Russian partners. The vessels *Mikhail Somov*, *Akademik Molchanov*, *Akademik Boris Petrov*, and *Kapitan Gorovatsky* are floating universities, while the vessels *Akademik Treshnikov*, *Akademik Fyodorov*, and *Dal'nee Zelentsy* are used for marine research and expeditions. The ice-resistant platform "North Pole", which has 15 laboratories on board, allows year-round Arctic expeditions.

As a result of cooperation between the Institute of Oil and Gas Geology and Geophysics of the Russian Academy of Sciences and Germany's Helmholtz Institute Centre for Polar and Marine Research, a year-round Russian-German scientific station known as Samoilovsky Island was created to monitor the dynamics of climate change and permafrost, study the interactions between

the Arctic ecosystem and the atmosphere, and forecast methane emissions. However, international cooperation at the station was stopped in 2022.

Additionally, the largest Arctic stations have been in operation since Soviet times: Cape Baranov Ice Base (on the Severnaya Zemlya Archipelago), the atmospheric observatory for climate monitoring in Tiksi (Yakutia), the Northeast Science Station in Chersky (Yakutia), and the Polar Geophysical Institute observatory for monitoring geomagnetic variations and cosmic rays (Spitsbergen).

The second approach is through fundamental research. The study of ocean acidification requires long-term cooperation. This is a problem that occurs when the alkaline level of water declines, threatening the extinction of many species of marine life. To monitor this phenomenon the Arctic Ocean Acidification Centre was established in 2020 as part of the Global Ocean Acidification Effect Observation and Research Network. According to experts, to properly understand ocean acidification it is necessary to collect huge amounts of data on oceanic temperature, salinity, oxygen levels, pressure and other parameters. It is crucial that researchers from different countries have free access to this data.

The prospects for Arctic science diplomacy are linked to projects of global significance: climate change, melting ice, thawing permafrost, ocean acidification, environmental degradation and the loss of biodiversity.

The Arctic Baseline Observations Network project, initiated by the US National Academy of Sciences, addresses this challenge. The goal of the network is to create a system for sharing data on changes in the Arctic's natural, socio-economic and cultural conditions.[37] Such projects, with the participation of the International Arctic Science Committee and the AC working groups, simply cannot exist without Russia's participation due to the size of its Arctic territories.

Many states located far from the Arctic are interested in climate change studies. For example, melting Arctic ice has destabilised the winds over the Indian Ocean, resulting in chaotic monsoons. This anomaly is accompanied by more prolonged droughts and floods, negatively affecting agriculture throughout South Asia.[38] China is experiencing more coastal flooding and inland freezing.[39] In Japan, warming waters are depleting cold-water fish species in coastal seas, which are the mainstay of fisheries in the north-east of the country.[40] Climate change is creating not only widely discussed problems such as melting permafrost, but also unexpected threats that can quickly become global. For example, Chinese scientists have discovered more than 1,000 new, previously unknown species of bacteria in the melting ice of Tibet. If the melting continues, these bacteria could end up in the rivers of India and China. It is highly likely that today's plants, animals and humans are not immune to these ancient bacteria.[41]

Environmental cooperation should also be mentioned. It is in the interests of Russia's Arctic neighbours to develop transboundary pollution control, which functioned through the AC working groups until 2022. This work can be continued on a bilateral basis with the Russian Research Centre on the Spitsbergen Archipelago, Roshydromet, the AARI, and university centres (SAFU, Moscow State University, Saint-Petersburg State University, etc.).

The third approach is the development of unique technologies that meet important environmental requirements. The design of local hybrid power plants, combining diesel fuel with renewable energy, seems relevant for the long period of transition to green energy. These include:

- wind power installations in Tiksi (built by Russia's RusHydro Holding and Japan's state company NEDO);
- the Kola wind farm in the Murmansk region (built by Russia's ENELT and Spain's Siemens Gamesa); and

- solar power generation installations in Verkhoyansk, Yakutia (built by ENELT and RusHydro).[42]

Hybrid power units can save up to 30% of diesel fuel. After foreign partners withdrew from cooperation with Russia in 2022, the production of components for local power plants was localised by 70%, which made the projects viable.

Compact nuclear units are also considered promising. Russia has developed block-transportable nuclear units for supplying power to remote cities and industrial companies. Their advantages are based on their short construction time (less than two years), modular structure, stable operation, low energy costs, high reliability and environmentally friendly principles. Rosatom is building the first small nuclear power plant in the world in the Ust-Yansk region of Yakutia.[43] Similar projects are under way in Argentina, China, Denmark, France, the Republic of Korea, the United Kingdom and the United States.[44] Another type of existing compact power unit is the Akademik Lomonosov floating nuclear thermal power plant operating in Pevek.

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The next attractive project is the development of green energy technology, primarily hydrogen energy. Preferred partners are Japan and the Republic of Korea.[45] However, Russia has developed the capacity for both domestic consumption and the export of hydrogen. The main problem is which technology should be used to develop hydrogen production. For Arctic conditions, the most promising option is to produce hydrogen from existing overcapacities, whether from renewable sources or nuclear power plants.

Another area of potential cooperation is in liquid natural gas (LNG) technologies, with research needed on production, storage and transportation. LNG will be needed in the foreseeable future for the modern energy market and Russia's internal needs, especially for the gasification of eastern Siberia. On world markets, LNG supplies meet the requirements of flexibility both in terms of supply routes and volumes.[46]

Conclusions

Neither research nor solutions to global Arctic-related challenges are possible without resuming scientific cooperation with Russia, because it has accumulated impressive scientific experience and developed infrastructure spread across half of the Arctic area. But due to the current fracture in Russian-Western relations, Arctic scientific cooperation has been halted.

The main challenge is to find mechanisms for ways to resume cooperation with Russia in the Arctic. One important tool is science diplomacy, which is used by both Arctic and non-Arctic states. The High North Talks, a diplomatic dialogue initiated by the Geneva Centre for Security Policy (GCSP), could be a platform for resuming Arctic cooperation or to reinitiate a possible limited exchange within the scientific community, especially on environmental and climate change issues.

The main challenge is to find mechanisms for ways to resume cooperation with Russia in the Arctic.

In terms of international law, resuming the implementation of the 2017 Agreement on Enhancing International Arctic Scientific Cooperation seems to be a promising way forward, because it is not connected to political or military antagonism.

At the institutional level, a return to cooperation in the AC is unlikely in the foreseeable future. However, the following options, which are not mutually exclusive, seem possible:

- the creation by Russia of a new and inclusive organisation in the country's Arctic zone;
- the development of bilateral cooperation between Russia and non-Arctic states;
- an emphasis on global and international scientific NGOs; and
- support for Track 2 diplomacy and science diplomacy on issues related to the environment and climate change through neutral, independent, impartial and inclusive platforms or forums, such as GCSP's High North Talks.

Additional options for resuming cooperation with Russia, including through the AC working groups, are subject to the implementation of the sanctions regime against Moscow.

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