

Keeping Ahead of Arctic Science in Difficult Times - What Scientists Seek and Do

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Arctic research in 2022

In February 2022, Russia invaded Ukraine. It is impossible to paint an overall picture of the future environment and climate change in the Arctic without information on Russia, which occupies a large area of the Arctic. Researchers are struggling to find ways to conduct political and environmental research.

Arctic science has been promoted under the auspices of peace. However, this is difficult to maintain. The International Arctic Science Committee (IASC), which promotes Arctic science, was also established in 1990. At the end of the 1980s, when the Cold War was ongoing, the idea of promoting collaboration among scientists emerged, leading to the establishment of the IASC. Founded in 1990, easing Cold War tensions and a more peaceful world have boosted science. Simultaneous to IASC, the Arctic Environmental Protection Strategy (AEPS) was launched, leading to the subsequent establishment of the Arctic Council (AC). Environmental protection is an expected benefit for the Arctic region. This is a common global problem.

Arctic after 1990

After the end of the Cold War, the easing of the East-West tensions led to progress in scientific cooperation. However, the current situation is called the new Cold War. In 2022, security between nations returned to the beginning. Rachold (2022) summarized success stories in Arctic science cooperation over 30 years since the 1990s. While referring to the report, what we can see from past scientific efforts is:

- There is the establishment of the Arctic Council, which has directions from AEPS: Environmental protection and long-term monitoring. Accurate knowledge of science and cooperation are essential to facilitate diplomacy.

- International Polar Year (IPY) 2007/08: Association of Polar Early career Scientist (APECS), Polar Educators International (PEI), and Sustaining Arctic Observing Networks (SAON) are the legacies of IPY.
- Arctic Dialogue: Forums were created — Arctic Circle, Arctic Frontiers, and others. Arctic Science Ministerial Meeting (ASM) has started.

Have all these activities built and accumulated over the last 30 years been broken? Alternatively, there is a question of what remains and what will be maintained in the future.

Movements of each country, each group, and individual response

Since March, various countries and organizations have issued statements. Words wishing to end the war and return to peace are common. Opinions regarding problematic situations have been expressed by various organizations and researchers.

- International Science Council (ISC) expressed Invasion concerns on February 28, 2022.
- IASC: Russian representatives and institutions attending the Arctic Science Summit Week (ASSW) have been discussed.
- The Arctic Council issued on March 3, 2022, a suspension of activities of seven countries other than Russia.
- Russian Academy of Sciences (RAS) March 10, 2022. “Statement by members of the presidium of the Russian Academy of Science” expressed, expecting the end with an early agreement and maintain Russian science as a member of international exchange, a statement against obstacles of science.
- The Arctic Council issued a comment on June 8, 2022, announcing its intension to resume limited situation in seven countries.
- Nature Editorial’s commentaries, July 21, 2022 issue states:
 - Damage to research on climate change (Witze, 2022).
 - The short-term decline in research projects but the need for long-term maintenance (Gained et al. 2022).
 - The importance of keeping researcher’s exchange channels open (Nature Editorial, 2022)
- EU issued “Principles regarding Russia and Belarus in multilateral fora following the Russian aggression against Ukraine” on March 21, 2022.
- APECS statement: March 18, 2022: “limit the isolation of Polar early career researchers behind political borders and encourage the continued participation of our Russian members”.

Consider the intentions for scientific activities that can be read from those statements.

The Arctic Council is considering resuming its activities. It is possible to perform activities in a single country or several countries.

As a principle of action, the EU states that restrictions are unavoidable. However, at the end of the principles, climate change countermeasures are an issue for maintaining engagement.

Scientists are emphasizing the importance of contact between individuals when exchanges between countries are suspended and between organizations are restricted. One can read the intention to create resilience in scientific activities and prepare for a restart.

Russian scientists, based on the RAS statement, expect to collaborate internationally. Intentions from both sides, which are currently divided, are connected.

Young people, who are the future leaders of science, still want to collaborate with young people from any country. This will lead to future research in this area.

Regarding continuity of scientific activities

We can divide scientific activities into four categories.

a. Investigative activities: research and campaigns

Working in a region that includes Russia is challenging. In the short-term, this will have to be postponed. Suspensions, postponements and cancellations are possible. Research is temporarily suspended. Scientists are looking for complementary regions and themes.

b. Environmental monitoring

AC is on hiatus due to Russia's invasion of Ukraine. Based on the AC's essential activity for environmental protection initiated by the AEPS, we expect to maintain the activity of environmental protection. Monitoring, maintenance, and management of the environment should not be interrupted or neglected, and maximum cooperation and efforts should be made to continue. Monitoring activities should be maintained by participating countries and all participants without gaps. Since the starting point of the AC's role is to maintain environmental monitoring, it would be beneficial if we could ask for cooperation from a long-term perspective.

c. Operational work for meteorological, environmental, resource and safety

Field operations continue to operate, including in Russia. Conventions and United Nations meetings are also maintained. Collective, substantial activities constitute the scientific system of the entire planet. For example, there is the distribution of observation information in the World Meteorological Organization's data transfer for weather reports. It is also a fundamental infrastructure of society.

Data on Arctic warming have not been limited to the past 30 years, but accumulations at high Arctic latitudes have been observed since the early 20th century. The critical areas are located in the Arctic Ocean and northern Russia. Beginning in 1937, most of the data were from the Arctic Drift Station: North Pole (NP), which is open to the public. Data from research activities that continued during World War II and the Cold War were shared to understand the current state of global warming. The data from that era will undoubtedly be data that can lead to important discoveries and cannot be obtained again. Consequently, observers continued their weather monitoring activities.

d. Human resource development and support

It is necessary to ensure that the current education does not become a problem to return in the future. There should be no obstacles in nurturing the young people who will lead us into the future. Since March, several countries have made declarations to protect student education. It is sent to

an institution related to education. Looking back on the future, we must avoid a situation in which the students and young researchers who were supposed to grow up in this era are missing.

Beginning and ending for the time of re-departure

Owing to the current international political situation, AC activities based on the agreement of the eight Arctic nations are no longer possible.

Although the Arctic issue occurs in the territories of the eight AC countries, the "Arctic" as a scientific arena is wider than the geographical Arctic Circle. In addition, the occurrences of natural phenomena are vast and the scope of their influence is global. In global science, there is interest, support, and investment. The global power of science must be harnessed. It is helpful to consider the international backing of the 24-member IASC and ASM, which includes 35 participating countries, regions, and institutions (ASM3, 2021).

The IASC has begun discussions on the Fourth International Conference on Arctic Research Planning (ICARP IV), which considers a long-term plan for ten years from 2025, and IPY activities to be held in 2032. The last IPY initiated PEI and APECS. The involvement of indigenous people has also been strengthened. Even if short-term research activities and infrastructure maintenance stagnate, it is impossible to quickly train researchers who will become the leading force in the future. In addition to national movements, many other activities have been supported by individual networks. We know of the models and the scientific community network established in the last 30 years. This experience can also be used.

References

- ASM3 (2021). Knowledge for a Sustainable Arctic – 3rd Arctic Science Ministerial, 8-9 May 2021, Tokyo (Japan), 162p, https://asm3.org/library/Files/ASM3_Final_Report.pdf
- Gaind, Nisha, Alison Abbott, Alexandra Witze, Elizabeth Gibney, Jeff Tollefson, Aisling Irwin, and Richard Van Noorden (2022). Seven ways the war in Ukraine is changing global science, *Nature*, 607, 440-443, Doi: <https://doi.org/10.1038/d41586-022-01960-0>
- Nature Editorial (2022). For the climate's sake, keep Arctic communication open, *Nature*, 607, 422, DOI : <https://doi.org/10.1038/d41586-022-01956-w>
- Rachold, Volker (2022). Success Stories of International Cooperation in the Arctic, *Arctic Circle Journal*, <https://www.arcticcircle.org/journal/success-stories-of-international-cooperation-in-the-arctic>
- Witze, Alexandra (2022). Russia's war in Ukraine forces Arctic climate projects to pivot. *Nature* 607, 432, DOI : <https://doi.org/10.1038/d41586-022-01868-9>