



Joint Statement of Ministers

On the occasion of the
Third Arctic Science Ministerial

9 May 2021

Tokyo, Japan



Government of Iceland
Ministry of Education,
Science and Culture



MEXT

MINISTRY OF EDUCATION,
CULTURE, SPORTS,
SCIENCE AND TECHNOLOGY-JAPAN



We, the Ministers representing the eight Arctic States (Canada, the Kingdom of Denmark – here represented by Ministers of Denmark, the Faroe Islands and Greenland – Finland, Iceland, Norway, Russia, Sweden, and the United States), seventeen further States (Austria, Belgium, China, Czech Republic, France, Germany, India, Italy, Japan, Republic of Korea, the Netherlands, Poland, Portugal, Singapore, Spain, Switzerland, and the United Kingdom) and the representative of the European Union, as well as Arctic Indigenous leaders from six Arctic Indigenous Peoples Organizations (Aleut International Association, Arctic Athabaskan Council, Gwich'in Council International, Inuit Circumpolar Council, Russian Association of Indigenous Peoples of the North, and Saami Council), have gathered to further enhance international cooperation in science, research and knowledge production to advance understanding of the Arctic region, and to support the role of science in policy and decision-making in the Arctic.

We reiterate our appreciation to the United States for organizing the first Arctic Science Ministerial in 2016 in Washington D.C., and for recognizing the important role that an international gathering of Ministers including collaboration from both Arctic and non-Arctic States and Arctic Indigenous Peoples and civil society can have in focusing global attention and highlighting the importance of international Arctic science and research cooperation.

We furthermore wish to express our appreciation to the governments of Germany and Finland as well as the European Union for organizing the second Arctic Science Ministerial in 2018 in Berlin, and for strengthening collaboration with a gathering of science Ministers from around the world — joined by Arctic Indigenous leaders — demonstrating the global importance of Arctic science cooperation and the important partnership role Indigenous Peoples must play in science and research. The second Arctic Science Ministerial further recognized the vital and valuable role of local communities in Arctic science and research.

We come together for the third Arctic Science Ministerial in the spirit of cooperation and acknowledge that science and science-based policy measures are increasingly urgent in the Arctic due to the current speed of climate change and that they are relevant for Arctic residents, including Arctic Indigenous Peoples, and the global community.

We recognize the enduring contribution to international Arctic science cooperation facilitated by the Arctic Council, which celebrates its 25th anniversary this year. The Arctic Council remains the leading



forum for cooperation in the Arctic region, and reports and assessments by its Working Groups, have been instrumental in bringing Arctic issues to a global arena.

We recognize the value of an inclusive and diverse global Arctic research community that seeks to include all genders, ages, ethnic and cultural backgrounds, and in particular expertise from Arctic Indigenous Peoples, as well as the next generation of scientists and decision makers, and people from local communities.

We recognize the diverse knowledge systems continually developed and utilized by Arctic Indigenous Peoples, as well as the knowledge systems continually developed and utilized by local communities. We also recognize the need to meaningfully engage and partner with Indigenous Peoples to include the utilization of Indigenous Knowledge within international forums and agreements. We further acknowledge that Traditional Knowledge including Indigenous Knowledge and scientific research are both valid systems of knowledge that should complement each other within the context of collaborative and co-produced research to ensure that we have the strongest evidence-based information to inform holistic decisions and policies. Respect and support for Indigenous partnership and co-production of knowledge in research programs and projects are imperative for enhancing the efficacy, impact, and usefulness of research for Arctic Indigenous Peoples, governments, and others. This may require governments and research institutions to partner with Indigenous Peoples to implement engagement processes that respect the status and role they play in decision-making in relation to research involving their people, communities, and homelands.

Climate change stemming from mostly outside the Arctic is among the greatest challenges confronting the Arctic. Because the Arctic plays a key role in the global climate system, we recognize the importance of data to inform global response to climate change. We welcome the recent achievements by the international research community that are relevant to the Arctic, including: the Intergovernmental Panel on Climate Change (IPCC) Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), Global Assessment Report on Biodiversity and Ecosystem Services. We also welcome the United Nations Decade on Ocean Science for Sustainable Development (2021-2030) and the global Seabed 2030 initiative. Alongside these collaborative activities, the Arctic Science Ministerial science process will help support the implementation of the 2030 Agenda for Sustainable Development, the Paris Agreement, and the post-2020 Global Biodiversity Framework under the

Convention on Biological Diversity, and the reports on pollution, chemicals and climate change by the Arctic Council Working Groups.

We welcome the entering into force, on 23 May 2018, as well as the continued implementation of the Agreement on Enhancing Scientific Cooperation in the Arctic, as negotiated under the auspices of the Arctic Council, and its relevance for improving international scientific cooperation.

We welcome the ongoing process to ratify the legally binding Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean, which upon entry into force will facilitate cooperation in scientific activities and establish a Joint Program of Scientific Research and Monitoring of the Central Arctic Ocean. We acknowledge the work that has been done to prepare for its implementation.

Knowledge for a Sustainable Arctic is the main theme for the third Arctic Science Ministerial. Under this theme, four sub-themes identify the most urgent actions that can be met through international cooperation:

1. Observe: implementing observing networks; data-sharing
2. Understand: enhancing understanding and prediction capability for Arctic environmental and social systems, for the global impact of these changes
3. Respond: operationalizing sustainable development, evaluating vulnerability and resilience, and applying Knowledge
4. Strengthen: preparing the next generation through capacity building, education, networking; and resilience

Further information about the ASM3 Science Process and its outcomes can be found in the accompanying Science Report.

1. Observe: implementing observing networks; data-sharing

Reliable data about changes in the Arctic are more limited than for most other parts of the planet. Vast gaps of *in situ* data in the Arctic remain, and there are limited long-term and space-based observations. In addition, foundational geospatial mapping is a fundamental input to a better understanding of Arctic ocean and coastal ecosystems, but much of the Arctic is not surveyed or is inadequately mapped. As observations of a wide range of variables (such as wildlife, atmosphere, water, land, ice, snow, coastlines, oceans, as well as of social, cultural, and economic impacts) are required from a variety of observation platforms (such as marine, surface, upper air, and space-based), sustaining long-term *in*

situ observation systems in the Arctic is demanding and requires considerable human and financial resources. International commitment is required to sustain critical pan-Arctic observation infrastructure, ocean and coastal mapping, a high level of coordinated campaign observations, and a focus on data management and sharing. For some observation systems, empowering Indigenous Peoples and other Arctic residents to engage in research and monitoring programs is important for fostering a localized observing system that includes community-driven observation. The urgency of these actions has become even clearer during the COVID-19 pandemic, apart from satellites and surface networks, which has amplified some of the existing weaknesses in sustaining long-term observational research.

Proposed Actions

We therefore intend to cooperate through the following actions: Explore opportunities for mapping as well as supporting the implementation of an enhanced observing system for sharing data and results and deepening collaboration among scientists, technical experts, Indigenous Peoples, and other Arctic residents. We recognize the need to support and integrate Indigenous and community-led observations and foster the co-production of knowledge based on their free, prior and informed consent, as appropriate. We recognize the role the Sustaining Arctic Observing Networks (SAON) initiative has already played and acknowledge that supporting implementation mechanisms identified by SAON will continue to generate long-term benefits for strengthening Arctic observation and data systems. We recognize the need for research partnerships to be built on equal respect, with mutually beneficial and transparent protocols for data governance and intellectual property rights built on ethical guidelines as outlined in the International Arctic Science Committee (IASC) Data Statement.

Long-term:

- Encourage the strengthening and cooperation of existing long-term observation programs essential to tracking atmosphere, cryosphere, ocean, coasts, terrestrial, social, and ecosystem change and responding to a warming climate, and encourage the expansion into areas and subdisciplines where monitoring is absent to sparse, including through a co-production process in remote communities.
- Promote planning for international cooperation in observational efforts to monitor the accelerating changes in the Arctic environment through national and international domain awareness platforms (satellites, stations, community-led observations, vessels, buoys, and other marine technology) through or in partnership with SAON.

- Support ongoing efforts from the IASC/SAON-led Arctic Data Committee and others to harmonize data collection and sharing, particularly those working to make Arctic data and metadata more consistent, discoverable, interoperable, ethically open and accessible, and respect the rights of Indigenous Peoples, as applicable, especially with data pertaining to Indigenous Peoples.

Near-term:

- Strengthen the work of SAON:
 - Encourage finalizing the Roadmap for Arctic Observing and Data Systems (ROADS) through the coordination and cooperation between national and international programs, small and large projects, and infrastructures, and prioritize implementation.
 - Promote the expansion of the ROADS efforts to also reflect priorities of Indigenous Peoples.
 - Encourage SAON to update a gap analysis of where Arctic observations are missing and recommend strategies to address priority gaps.
- Foster the development and Arctic deployment of new technologies, such as autonomous and interoperable tools for observations, share advances in technology innovation across the Arctic community of interest.
- Encourage the inventory of Arctic mapping gaps and develop operational coordination plans to acquire and share new data to support Arctic science and community resilience.

2. Understand: enhancing understanding and prediction capability for Arctic environmental and social systems, for the global impact of these changes

Changes in the Arctic are not only affecting the people who call the Arctic home and are inextricably linked to the Arctic environment and its resources, but actions outside the region continue to impact the Arctic environment and the changes occurring have cascading effects on the rest of the world. The effect of the loss of sea ice is speeding up coastal erosion and marine ecosystem change, which can have broader socio-economic impacts in the Arctic. Globally, changes in the Arctic significantly contribute to sea level rise, trigger extreme events and further accelerate global warming among other things. To understand the structure and dynamics of these complex systems we need focused and cross-cutting research, including Indigenous-led research, as well as long-term and multi-scale observations that fully represent the Arctic. Past climate archives, reliable predictions, and enhanced modelling

capabilities for the Arctic are essential for developing effective mitigation and adaptation strategies. To progress from *Observing* to *Understanding* we must understand not only how the patterns are changing, but also how the biological and ecological mechanisms that determine the patterns are changing. We intend to strengthen international collaboration for Arctic science and research to enhance the assessment of ongoing change and to improve prediction for future change.

Proposed Actions

We therefore intend to cooperate through the following actions: Recognize the complexity of the system connecting all environmental and socio-economic components, and encourage further interdisciplinary, systemic approaches and co-production of knowledge. Advance the understanding of processes and mechanisms that underly the changes in patterns and their interactions.

Long-term:

- Encourage societally relevant research and co-production of knowledge on the impacts of thawing permafrost, rising sea levels, melting glaciers, shrinking snow coverage, coastal zone processes, ocean acidification, disappearing sea ice, increase of invasive species, altering biological and ecological systems, as well as effects of pollutants to inform response plans including mitigation of and adaptation to climate change.
- Foster efforts to improve modelling and prediction of Arctic environmental, societal, and economic change, including the role of the Arctic on global systems.

Near-term:

- Building on the success of international activities such as the Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAIC) Expedition and the Year of Polar Prediction (YOPP), promote the data analysis and synthesis of these initiatives and encourage similar efforts that require multinational cooperation to succeed.
- Encourage research efforts and co-production of knowledge that informs the prediction and mitigation of risks and hazards associated with Arctic change and that address the impacts of Arctic change such as pollution, infectious diseases, food security through activities of fisheries, and biodiversity, particularly those that impact human health and well-being and ways and means to address those impacts.
- Prioritize projects that investigate linkages and interactions among various environmental components and those that enhance our understanding of complex Arctic socio-ecological systems, including the role of humans as drivers of change.

3. Respond: operationalizing sustainable development, evaluating vulnerability and resilience, and applying Knowledge

Warming at a rate two to three times greater than the global average, the Arctic is experiencing drastic changes in the natural environment. The changes are visible in many natural phenomena and ecosystems, e.g. wildland fires, permafrost thawing, sea ice retreat, and their impacts on cultures and societies are becoming clearer. Further amplified Arctic warming will continue at least until mid-century and will likely occur regardless of any prompt action taken to reduce greenhouse gas emissions. The rate and amount of warming will depend critically on our collective efforts today and in the coming years to reduce greenhouse gas emissions. It is, therefore, a matter of urgency to implement ambitious actions to mitigate climate change, adapt to its impacts, and support the sustainable future of the Arctic and its people. This approach must be informed by the best available science and knowledge.

Proposed Actions

We therefore intend to cooperate through the following actions: Support the work of existing international groups producing scientific response frameworks. Prioritize research that enhances our understanding of complex Arctic socio-ecological systems, including the impact of humans as drivers of change while needing to adapt to change. Further recognize the need to utilize and apply Traditional Knowledge including Indigenous Knowledge into decision making for effective response measures to climate change.

Long-term:

- Encourage continuation of the critical work of the Arctic Council working groups and expert groups, World Meteorological Organization (WMO), United Nations Environment Programme (UNEP), IPCC, IPBES, International Maritime Organization (IMO), International Oceanographic Commission (IOC), and other groups that are producing important scientific assessment and synthesis products that inform response plans.

Near-term:

- Encourage the development and expansion of innovation and technology projects that support mitigation and adaptation to climate change.

- Foster research to support mitigation of and adaptation to climate change, preparedness and response, plans for search and rescue, pollution remediation, wildfires and other societally relevant climate change risks and hazards in the Arctic.
- Identify specific mutual research priorities and opportunities for community-led research, in co-leadership with Arctic Indigenous Peoples.
- Promote research efforts that support food security, conservation measures, and sustainable development in the Arctic.

4. Strengthen: preparing the next generation through capacity building, education, networking; and resilience

We encourage efforts to promote capacity building, education, and networking across the Arctic to build resilience and foster a diverse global research community, which includes Indigenous Peoples, early career researchers, minorities, and women. It is critical and beneficial to the wider research community to build and support capacity in education and skills for Arctic residents and the international community. It is also critical to recognize the importance for Indigenous Peoples to practice their knowledge systems and apply them to existing and future research and monitoring programs. It is also critical to recognize the importance for local communities to practice their knowledge systems and apply them to existing and future research and monitoring programs. It is important to ensure local partnering of research projects with institutions, as well as to make relevant results and new knowledge available and easily accessible for Arctic residents, businesses, and decision-makers in order to resolve societal challenges and foster long-term local and regional sustainable development.

Proposed Actions

We therefore intend to cooperate through the following actions: Recognize the urgent need and identify gaps in support, capacity building, education, and networking, both in the Arctic and the wider global Arctic research community, and provide pathways of assistance. Encourage participation and active engagement in existing international Arctic education frameworks such as the Association of Polar Early Career Scientists (APECS), Polar Educators International (PEI), and University of the Arctic (UArctic).

Long-term:

- Develop strategies to recruit and retain early career Arctic researchers, professionals, and Indigenous Peoples.
- Encourage the development and application of bilateral and multilateral agreements that decrease bureaucratic barriers and increase accessibility of research and education facilities, particularly between Arctic and non-Arctic countries.
- Promote efforts that support scientific and educational collaborations, especially among early career researchers, both Arctic and non-Arctic, as these are needed to maximize joint benefits and avoid duplicated efforts.

Near-term:

- Encourage multinational participation in field station and ship-based research such as the Forum of Arctic Research Operators (FARO), Pacific Arctic Group (PAG), Svalbard Integrated Arctic Earth Observing System (SIOS), International Network for Terrestrial Research and Monitoring in the Arctic (INTERACT) and Arctic Research Icebreaker Consortium (ARICE).
- Encourage the development of an Arctic strategic communications initiative in collaboration with organizations such as APECS and PEI focused on the global public and promote community-led projects, as well as citizen science, leading to a better understanding of the causes and consequences of climate, social and environmental change.
- Encourage active participation in the UArctic, and further develop, and support, the existing structures for education cooperation and mobility.

Cross-Cutting Proposed Actions: In addition to the theme-based actions, there are several cross-cutting actions that are critical to supporting Arctic science and research:

- Promote the creation of Arctic high-speed communication infrastructures that are necessary for most science projects as well as capacity building, training, and education activities at the community level, including in remote communities.
- Encourage entities conducting or supporting Arctic research to maintain and enforce an ethically open data policy that includes accessible repositories or ties into other existing repositories.
- Support efforts that promote inclusivity and diversity in Arctic Research.

- Encourage efforts to translate scientific and educational materials into other languages, particularly to and from Indigenous languages and Russian.
- Endorse existing national committees that work to coordinate international Arctic research efforts and, in the absence of such entities, encourage their development by drawing on existing collaboration frameworks where possible.

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Arctic Science Funders Forum

Through the initiatives of the second Arctic Science Ministerial, the Arctic Science Funders Forum was officially established on 30 March 2020. We support the establishment of this Forum and encourage funding agencies involved in the Arctic Science Ministerial to collaborate on further bilateral and multilateral research efforts set forth by this Ministerial.

Conclusion

Through the proposed cooperative actions set forth by this third Arctic Science Ministerial, we demonstrate the importance that our respective governments, the European Union, and Arctic Indigenous Peoples Organizations place on supporting international cooperation in science, research, and knowledge production towards achieving a sustainable Arctic.



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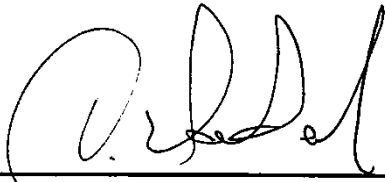
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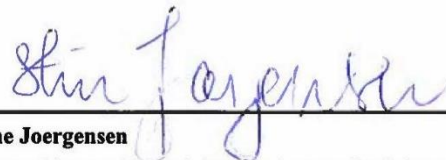
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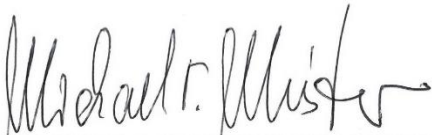
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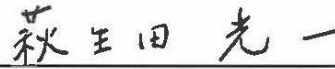
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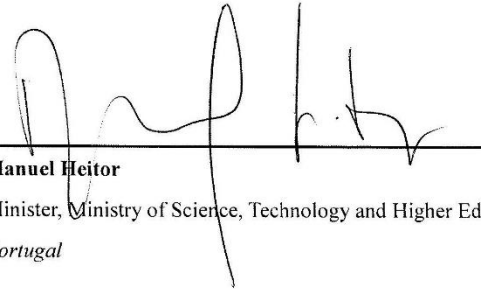
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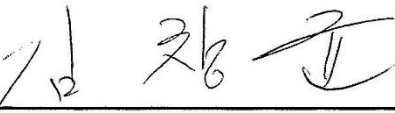
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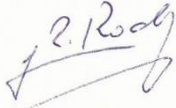
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