



# ARCTIC OBSERVING SUMMIT

*Observing for Action*

# OBSERVING FOR ACTION: SUMMARY OF SCIENTIFIC OUTCOMES OF THE 5TH ARCTIC OBSERVING

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The Arctic Observing Summit (AOS) is a biennial event, convened as part of the Sustaining Arctic Observing Networks (SAON) initiative, to guide the design, coordination, and long-term operation of an international network of observing systems that improves our understanding of and response to Arctic change.

The 5th AOS (30 March - April 2, 2020) was set to take place in Akureyri, Iceland under the theme of "Observing for Action". Given

the circumstances brought on by the Coronavirus pandemic (COVID-19), the Summit was transformed into an online forum, drawing over 350 participants from 28 countries, including more than 40 Indigenous experts and representatives of Indigenous Peoples and organizations.

## 2020 Summit Sub-themes:

Based on recommendations and priorities identified at previous Summits, AOS 2020 was structured into five sub-themes, each addressed by a thematic working group:

Sub-Theme 1: Design, Optimization and Implementation of the Observing System

Sub-Theme 2: Observing in Support of Adaptation and Mitigation

Sub-Theme 3: Observing in Support of Indigenous Food Security and Related Needs

Sub-Theme 4: Data Interoperability and Federated Search

Sub-Theme 5: Arctic Observations in the context of Global Observing initiatives

In preparation for the Summit, community input in the form of white papers and short statements on these thematic areas were solicited. Fifty-five contributions were received and are [posted on the AOS website](#). During the Summit, the thematic working groups evaluated and synthesized these statements, and other relevant information to report on the state of Arctic observing under each sub-theme, to identify linkages among themes, gaps, needs and priorities and to generate discussion around solutions, implementation, community engagement and international cooperation. Summaries of outcomes, and recommendations to contribute to the development of the SAON Roadmap for Arctic Observing and Data Systems (ROADS) and pathways forward from each working group follow.

## Working Group 1: Design, Implementation, and Optimization of Arctic observing systems

The existing Arctic Observing system is a

mix of components, networks, and organisations each operating within their own topical, national, methodological, or circumstantial scopes. The Design, Implementation, and Optimization Working Group (WG1) conceptualized a unified, coordinated Arctic Observing System in which these operate in concert and considered strategies for integrating the plethora of existing initiatives, networks and observing activities across the Arctic. There was consensus that global networks are doing outstanding work and their efforts extended into the Arctic region would be an immensely valuable contribution to the ROADS process. However, delegates agreed that the effort of organizing observations is most valuable when there is a specific need for information sharing across sectors. Further, members proposed that Shared Arctic Variables be the standard around which the coordinated system is organized. This system must utilize standards applicable across sectors in order for observations to meet societal needs and provide benefits, and also have sufficient flexibility to be inclusive of the groups that have resources (including time, access, and ideas) to contribute. The ROADS process was recognized as an important and timely next step towards the ongoing implementation of an organized and collaborative Arctic Observing System. The working group recommended SAON convene broadly inclusive expert panels in order to begin development of a set of Shared Arctic Variables.

### **Working Group 2: Observing in Support of Adaptation and Mitigation**

The ability to plan for, adapt to and mitigate change in the Arctic, as elsewhere, requires the sustained and iterative design and implementation of a pan-Arctic, internationally supported and maintained network of observing systems. Working Group 2 members agreed that while many elements of an Arctic Observing System of Systems (AOSS) are already in place, identified gaps need to be filled in order to maximize benefits to society. Coordination and interoperability of people and systems

are necessary to ensure that data and information flowing from this AOSS is available, accessible and useable. The AOSS should support decision making across time and space, people and organizations, the development of policy options, real-world solutions to existing and emerging issues, and the implementation of toward strategic adaptation initiatives and mitigation efforts. Group members also agreed that the successful use of observing partnerships in aiding adaptation and mitigation efforts is linked to an inclusive participatory process that weaves Indigenous and local expertise with scientific knowledge. Indigenous knowledge holders and community-based observing/monitoring play an integral role in advancing the use of observing technologies to facilitate effective adaptation initiatives. There are also useful approaches (e.g., citizen science) to engage stakeholder groups.

### **Working Group 3: Observing in Support of Indigenous Food Security and Related Needs**

A primary goal of the 2020 Summit was the development of a framework within which impactful Essential Arctic Variables (EAV) could be assessed jointly by different data users and observing network operators. Working Group 3 developed this framework through the lens of food security and based on several critical elements identified during their discussions. This perspective is critical for a successful ROADS process. Key outcomes and recommendations that emerged from the deliberations of WG3 include:

- Viewing food security through an Indigenous lens;
- Weaving human health and wellness into every aspect of the observing system;
- Supporting community-driven research and monitoring; and
- Focusing capacity building on Indigenous organizations, communities and researchers.

#### Working Group 4: Data Interoperability and Federated Search

Data are an integral part of the observing system value chain. A system that makes well documented data accessible and useable in decision making contexts, and that does so in ethical and responsible ways is critical. Working Group 4 members stressed the need to move towards a co-production model to ensure that a fully developed Arctic Data system is established through focused, practical efforts sharpened by continued engagement with community members as well as with broader international initiatives. Participants agreed that all protocols must be considered including the ethical data principles that focus on Indigenous data sovereignty but also a recognition of local protocols (e.g., individual communities, national and regional). The need to empower the development of concrete applications which provide practical solutions aligned to the digital requirements of the Arctic observing community was stressed. As a foundation for all systems, this will prioritize creating a distributed, co-owned, sustainable and coherent system of digital resources which all partners can co-develop and leverage for their respective needs.

#### Working Group 5: Arctic Observations in the context of Global Observing initiatives

Although the Arctic is a hotspot of global change, the Arctic Observing System is still lacking the coverage and continuity required to obtain a full picture of the nature and pace of the changes seen across all domains. Working Group 5 members recommended that the SAON Roadmap for Arctic Observing and Data Systems employ the processes established by the global observing systems for identifying and defining the essential Arctic Variables wherever possible.

#### Summary:

Sustained observations, including those from Indigenous observers and programs, enable improved tracking, understanding, and projecting of future trajectories of Arctic change. They are necessary to guide adaptation and mitigation responses from local to global scales.

[Overall recommendations and call to action](#) from

the AOS 2020 include, among others, that a pan-Arctic Observing System of Systems must be:

- Designed to reflect societal and scientific needs with design drawing on Essential and Shared Arctic Variables;
- Coordinated and where needed integrated with global observing systems;
- Relevant to people's lives, decision making, and policy;
- Supported with a networked, collaborative, interoperable digital system that is based on co-production and ethical data principles.

AOS 2022 will be held during the 2022 Arctic Science Summit Week (ASSW 2022) in Tromsø, Norway on 26 March - 1 April 2022. For more information on the AOS, please visit [arcticobservingsummit.org](https://arcticobservingsummit.org).

#### AOS 2020 Executive Organizing Committee:

Peter Schlosser, Hajo Eicken, Thorsteinn Gunnarsson, Alice Bradley, Raychelle Aluaq Daniel, Gerlis Fugmann, Larry Hinzman, Eva Krueffel, Jan Rene Larsen, Maribeth Murray, Roberta Pirazzini, Allen Pope, Peter Pulsifer, Ravi Darwin Sankar and Federica Scarpa.