

Building an Arctic GEOSS SAON Strategy: 2018-2028

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Introduction

The Sustaining Arctic Observing Networks (SAON) is a joint initiative of the Arctic Council and the International Arctic Science Committee that aims to strengthen multinational engagement in pan-Arctic observing. The SAON process was established in 2011 at the Seventh Ministerial Meeting of the Arctic Council (AC) via the Nuuk Declaration. This declaration recognizes the “importance of the Sustaining Arctic Observing Networks (SAON) process as a major legacy of the International Polar Year for enhancing scientific observations and data-sharing.” The declaration also defines the SAON governance structure and Terms of Reference, which were formally approved in 2012¹.

In 2014, the SAON Board finalized its first implementation plan, which established two committees: The Arctic Data Committee (ADC) and the Committee on Observations and Networks (CON). The ADC aims to promote and facilitate international collaboration to establish free, ethically open, sustained, and timely access to Arctic data through easily accessible and interoperable systems. The CON aims to promote and facilitate international collaboration towards a pan-Arctic Observing System.

The following SAON Strategy document provides a 10-year strategy for addressing current and future Arctic observing needs. The document, approved by the SAON Board in January 2018, sets priorities for how SAON will fulfil its mission. It describes SAON’s vision, mission, guiding principle and goals, and outlines the manner in which the goals will be achieved, through the establishment of a Global Earth Observations System of Systems (GEOSS) for the Arctic.

¹ https://www.arcticobserving.org/images/pdf/Terms_of_Reference/saon-terms-of-reference.pdf

Vision

SAON's vision is a connected, collaborative, and comprehensive long-term pan-Arctic Observing System that serves societal needs.

Mission

SAON facilitates, coordinates, and advocates for coordinated international pan-Arctic observations and mobilizes the support needed to sustain them.

Guiding Principles

The following guiding principles reflect the overarching philosophies that drive the SAON process.

- SAON values both research and operational needs for Arctic observations;
- The Observing System is implemented and sustained through open cooperation among with all those committed to Arctic observations under a common SAON umbrella;
- The design and operation of the Observing System will be guided by a balance between bottom-up and top-down needs and priorities;
- SAON will promote contributions of all types of observations including but not limited to *in situ*, remotely sensed, and community-based observations, and the infrastructure supporting them;
- The Observing System will utilize Indigenous and local knowledge guided by ethical use and honouring the proprietary rights of data contributors;
- SAON will promote ethically free and open access to ethically-collected data;
- SAON will work with counterparts in the Antarctic, global, and national observation communities, where appropriate.

Following these principles, SAON aims to promote Arctic observing and to mobilize the support needed to achieve full implementation and sustain operations on time scales of decades and beyond.

SAON itself will not undertake research, science planning, policymaking, observations, data archiving, or funding of these efforts. SAON will however encourage and promote collaboration among ongoing networks/sites/systems and data centers, the organizations that support them, or appropriate decision-makers within these areas.

Goals

In keeping with the above vision and mission, SAON has adopted the following three goals and SAON's guiding principles support its work across these:

1. Create a roadmap to a well-integrated Arctic GEOSS;
2. Promote free and ethically open access to all Arctic observational data; and
3. Ensure sustainability of Arctic observing.

Addressing these goals will require the expertise and cooperation of a wide range of stakeholders and knowledge systems. While the Arctic Council is well-positioned to coordinate state level priorities and actions, effective implementation of the SAON Strategy will require partnerships. These partnerships include but are not limited to collaborations with policy-makers at all levels, Arctic Indigenous Peoples organizations, non-Arctic states, academia, civil society and the private sector, as well as engagement from other multilateral/international groups. SAON believes that effective implementation will require the participation of Indigenous Peoples and local communities and gender-balanced approaches.

Goal 1: Create a roadmap to a well-integrated Arctic GEOSS

The rapid on-going changes in the Arctic present an urgent need to better observe, characterize and quantify processes and properties of the Arctic system.

SAON will engage and facilitate connections among the producers and end-users of Arctic observations in order to create and sustain a well-integrated Arctic GEOSS. In order to achieve this goal, SAON believes that it is essential for participating parties to adopt a community-endorsed framework. The International Arctic Observations Assessment Framework², developed in partnership with SAON, provides such a starting point. SAON's role in further developing and implementing this framework will be to help to identify critical observations, products, and services that are relevant to the Arctic Observations *value tree*³. A holistic benefit analysis can then be used to assess the responsiveness of current Observing System and identify potential expansions. The results of this analysis will be central to the creation of a roadmap to well-integrated Arctic observing that is responsive to Societal Benefit Areas. This roadmap will also be used to identify funding sources to support

² <https://www.arcticobserving.org/images/pdf/misc/STPI-SAON-International-Arctic-Observations-Framework-Report-2017.pdf>

³ At the top level of the *value tree* are the Societal Benefit Areas (SBAs) that define the environmental, economic, and social domains in which services, operations, and research provide societal benefit. For more information about the *value tree* concept, see the source under footnote 2)

infrastructure required for sustaining or adding new observational capabilities as well as technological innovations to improve observation capacity.

SAON will collaborate closely with its partners and other prominent Arctic and international organisations as well as with the Arctic Council Permanent Participants to find synergies and joint activities to avoid overlapping efforts to achieve Goal 1⁴.

Goal 1 has five objectives:

- 1) Conduct an inventory of national observational capacities.
- 2) Complete an assessment of Arctic observational capacity.
- 3) Provide recommendations for a roadmap for future Arctic observational capacities.
- 4) Create opportunities to develop and implement observations in support of Arctic Societal Benefit Areas (SBAs).
- 5) Develop a long-term repository for relevant project deliverables.

Goal 2: Promote free and ethically open access to Arctic observational data

One of SAON's guiding principles is to promote ethically free and open access⁵ to ethically-collected data. The approximately sixty international participants at the 2016 Polar Connections Interoperability Workshop and Assessment Process agreed that the key current challenges impeding the development of a globally connected, interoperable system are social and organizational rather than technical: supporting human networks, promoting standards, and aligning policy with implementation.

A review of relevant Arctic data management efforts and results have guided the SAON vision for an open, interconnected, international system for sharing data across disciplines, domains, and cultures. Requirements and characteristics of such a system include but are not limited to:

- A distributed design that connects different data repositories and other resources. This implies and requires interoperability that supports sharing data among various information systems in a useful and meaningful manner;
- Many linked catalogues fostering 'single window' search;
- High quality, ethically open data sustainably preserved over time;
- Data as a responsive, "live" service rather than simple download approach;
- Inclusive of Indigenous and local perspectives and information;

⁴ SAON partners: <https://www.arcticobserving.org/partners>

⁵ The source of this concept is *International Arctic Science Committee, 2013. Statement of Principles and Practices for Arctic Data Management*: <https://www.iasc.info/data-observations/iasc-data-statement>

- Access to “big data” and powerful analytical tools (e.g. cloud platforms); and
- Cost effective, maximizing the investments made to develop and maintain the system.

In recognizing the elements of the envisioned system and the key challenges identified by the community, SAON will first focus on improving connections, and cooperation between actors. This will be achieved by working with the global Arctic data community, including data providers, data scientists, funders, users and beneficiaries within society. This effort will provide the necessary collaborative foundation needed to achieve the desired system.

Goal 2 has three objectives:

- 1) Create a road map outlining the steps towards achieving a system that will facilitate access to Arctic observational data.
- 2) Advance a system to facilitate access to Arctic observational data.
- 3) Establish a persistent consortium of organizations to oversee the development of a sustainable, world-wide system for access to all Arctic data.

Goal 3: Ensure sustainability of Arctic observing

Goals 1 and 2 can only be successful if the need for improved coordinated Arctic observation and sharing of data and resources are supported by all relevant stakeholders over the long term.

Goal 3 has three objectives:

- 1) Develop a strategy for long-term financial commitment in Arctic observations;
- 2) Apply the strategy developed in 3.1 to lobby funding agencies and states to ensure sustainability of Arctic observing; and
- 3) Secure funding for international SAON secretariat and operational costs.

Implementation

This Strategy will be implemented by the SAON Board and the SAON Committees as described in the *SAON Implementation*⁶ document for establishing an Arctic GEOSS. This document provides detailed information about how SAON will achieve its objectives, including description of timelines, cooperation with external organisation, and resource/funding requirements. The *SAON Implementation* is a living document that the SAON Board, Committees, and partners will update on a continuous basis.

⁶ <https://www.arcticobserving.org/strategy>