



SAON engagement in the H2020 project *Supporting the implementation of GEOSS in the Arctic in collaboration with Copernicus*

1. Background

SAON's vision is a connected, collaborative, and comprehensive long-term pan-Arctic Observing System that serves societal needs. SAON's mission is to facilitate, coordinate, and advocate for coordinated international pan-Arctic observations and mobilize the support needed to sustain them.

This document proposes SAON's expectation to the project and how SAON should be engaged in the project. The proposal should be linked to SAON's three goals:

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

Through its mandate and network, the role of SAON is to ensure pan-Arctic relevance and networking. In the context of the present call, SAON is offering connection especially to non-European countries and institutions and Arctic indigenous people.

SAON has wanted to establish ArcticGEOSS as a so-called *GEO Community Activities* and has submitted an application on this to the Group on Earth Observations (GEO)¹; this was approved by the GEO plenary in November, 2019.

2. Activity I: Contributing to the Roadmap

SAON has identified the need for a Roadmap for Arctic Observing and Data Systems to set a course for the needed system and to specify how the various partners and players are going to collectively work towards achieving it. This includes the equitable engagement of, and partnership with, Arctic Indigenous Peoples.

A well-defined assessment process is required in Roadmap development to establish a communal view of *societal benefit* and the intended user base of Arctic observations; such value-based assessments are critical to the case for sustained observing. A key tool for such assessment is the International Arctic Observations Assessment Framework (IAOAF, IDA 2017), jointly created by SAON and the Science and Technology Policy Institute following the 2016 Arctic Science Ministerial. The IAOAF identified 12 Arctic-specific Societal Benefit Areas

¹ The GEO Work Programme for 2020-2022: https://earthobservations.org/geoss_wp.php

(SBAs), which are supported by more than 160 *Key Objectives* for an observing system. An example of how to apply the IAOAF in value tree assessment, and to integrate economic valuation in such was initiated by the Finnish Meteorological Institute². Similarly, an Impact Assessment on Long-Term Investment on Arctic Observations (IMOBAR)³ provided policy makers with evidence to support long-term investments in Arctic observing systems. The 2020 Arctic Observing Summit will review assessment approaches and make specific recommendations for how these should proceed under ROADS. Assessment should support and justify an integrated Arctic Observing System and the identification of *Essential Arctic Variables (EAVs)* (see below) and guide the development of *Pilot Services* that should address multiple *Key Objectives* of the IAOAF. A clear understanding of costs and benefits of the Arctic Observing and Data System are critical to supporting sustainment of efforts, as described under Goal 3 of SAON Strategic Plan.

SAON has defined the ROADS process to be organized around Essential Arctic Variables (EAVs). These are identified for their criticality to achieving Arctic societal benefit, following systematic assessment using the IAOAF. EAVs are defined by their observing system (e.g. spatial resolution, frequency, coverage, accuracy) and data system requirements, which should transcend specific observing strategies, programs or regions. They are implemented through specific recommendations based on best available technology and practices. Implementation covers all activities from deploying observational systems through developing user services.

This activity will develop the documentation framework necessary to identify, describe and evaluate priority EAVs. It will support deliberative work across a relevant pan-Arctic community of experts to identify and define a series of EAVs. It will also develop impact assessments to argue for an extended and sustained Arctic Observing System.

Activities: Under the auspices of one or more ROADS Expert Panels, develop the generic framework necessary to identify through assessment, describe requirements under and implementation strategies for 2-4 EAVs

Deliverables:

1. 2-4 fully documented and implemented EAVs, contributing to SAON's overall Roadmap;
2. Demonstration that *Pilot Services* derived from EAVs critically support *Key Objectives* of the IAOAF, which should be documented as part of the growing value tree assessment practices using the IAOAF
3. Submitting an application for ArcticGEOSS as a GEO Initiative.

The activity will address project scopes i) and v). The activity addresses SAON's Goal 1) and 3).

² Value tree for physical atmosphere and ocean observations in the Arctic: <https://helda.helsinki.fi/handle/10138/300768>

³ https://www.researchgate.net/publication/325344166_IMPACT_ASSESSMENT_ON_A_LONG-TERM_INVESTMENT_ON_ARCTIC_OBSERVATIONS_IMOBAR

3. Activity II: Contributing to the interoperability of Arctic Data systems

In recent years, the Polar Data Community has made significant progress in many different areas of development. The foundation of this progress has been in the area of community building through activities such as meetings organized by the Arctic Data Committee and partners (e.g. Polar Data Planning Summit, Polar Data and Systems Architecture Workshop), the Polar Data Forum series, and engagement in the Arctic Observing Summit, coordination of efforts with GEO, the Research Data Alliance, CODATA and other global efforts.

Through these activities, the Community has identified priorities:

- A set of community building priorities and activities were developed at the Polar Data and Systems Architecture Workshop⁴.
- The top technical priorities articulated are:
 - Establishment of a federated search framework that supports Arctic communities, researchers, decision makers and others in achieving their goals with respect to finding Arctic (Polar) data. This is reflected through the joint development of the POLDER (*Polar Data Discovery Enhancement Research*) group through ADC, SCADM and SOOS.
 - Support the work of the ADC-IARPC-SCADM Vocabularies and Semantics Working group⁵
 - Develop a new action for delivering Analysis Ready Data for the Arctic

Activities: Support the community through adherence to the SAON principles of free and ethically open access to all Arctic observational data. Emphasis will be on supporting the Arctic Data Committee (ADC), the POLDER and the ADC-IARPC-SCADM Vocabularies and Semantics Working group. In addition, there is an interest in a roadmap to *Analysis Ready Data* for the Arctic

Deliverables:

- Support for the Arctic Data Committee, including engagement in
 - Federated Search work
 - The Polar Semantics Working Group, including organising vocabularies
 - The annual meetings of the ADC
 The deliverables will be 1) Minutes from the meetings of these initiatives, and 2) A status reports on Federated Search and Vocabulary and Semantics progress
- Supporting and preparing reports from
 - The Forth Polar Data Forum
 - A dedicated Data Forum for oceans
- An implementation plan for *Analysis Ready Data* for the Arctic

⁴ Summary Report: Polar Data and Systems Architecture Workshop:
https://arcticdc.org/images/download/PDSAW_preliminary_report_Draft_15Dec2018.pdf

⁵ Terms of reference: <https://arcticdc.org/activities/core-projects/vocabularies-and-semantics-wg>



The activity will address project scope iv). The activity addresses SAON's Goal 2).

4. Pilot Services

Expectations to pilot services are as described under scope iii). SAON wishes that there should be many *Pilot Services* and some should use the proposed *EAVs* for serving end users outside of the project consortia and including services with local, regional or global perspectives⁶. All *Pilot Services* should include their value chain into the Arctic Observations Assessment Framework and demonstrate their impact in this frame.

5. Engaging non-European partners and indigenous people's organisations

Eligible to funding under the call are European institutions. Among its members, SAON has a number of non-European Arctic Countries (Canada, Russia, USA), non-European non-Arctic Countries (Japan, Korea), international organisations (like WMO⁷) and observing networks. Importantly, the Arctic is home to Arctic Indigenous Peoples, who have lived there for thousands of years. Their knowledge of the Arctic environment is crucial, and their engagement in SAON is very important to ensure that needs and perspectives of Arctic Indigenous Peoples can be addressed. However, their capacity to participate in Arctic observing and monitoring project is limited, and Arctic Indigenous Peoples engagement in the project should be secured by ensuring sufficient funds to allow for their equitable participation in the project.

The project is about an ArcticGEOSS and should be conducted with a pan-Arctic participation. The advice would be that whoever consortium wins the bid, it should be prepared to engage with non-European institutions through the SAON governance structure. As mentioned above, ArcticGEOSS is already a GEO Community Activity, with an ambition to upgrade it to a GEO Initiative. The winning bid is expected to participate in and advocate for SAON in GEO events.

6. Resources/Funding

Funding should cover the salary for 48 months over four years for a person to be hired at the SAON Secretariat and travel costs for attending General Assemblies. Funding should also cover two workshops and the travel expenses associated with this. As stated above, sufficient funding for an equitable partnership with and engagement of Arctic Indigenous Peoples should be planned for.

⁶ Note: Inspiration for this may be found in the recent UAF/NSF submitted project by Eicken et al.

⁷ Note: Inspiration for this may be found in the recent proposal from WMO, presented by Etienne Charpentier



For Activity I, the person will support the SAON Secretariat and ROADS Advisory panel on all phases of Expert Panel activities of the ROADS process, including but not limited to maintaining a document archive of all relevant progress; coordinating Expert Panel meetings; coordinating assessments within and across Expert Panels; tracking and structuring necessary data to support assessments and value tree development; and tracking and structuring all documentation related to ROADS Essential Arctic Variables.

For Activity II, the person will support the Arctic Data and Networks committees as secretary.

There may be a need for subcontracting especially the more technical work under Activity II.

7. Legal perspectives

It will be the AMAP Secretariat that will sign the Grant Agreement on behalf of the SAON Secretariat.