Second Arctic Science Ministerial (ASM2)

Theme 1: Strengthening, Integrating and Sustaining Arctic Observations, etc.

Arctic Observing Summit (AOS)

Linkages & follow-up

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The first Arctic Science Ministerial launched a keystone effort in identifying 12 Arctic-specific “Societal Benefit Areas” (right) to support collective international action on observing.

Courtesy: IDA-STPI, SAON.

1. Disaster Preparedness
2. Environmental Quality
3. Food Security
4. Fundamental Understanding of Arctic Systems
5. Human Health
6. Infrastructure and Operations
7. Marine and Coastal Ecosystems and Processes
8. Natural Resources
9. Resilient Communities
10. Sociocultural Services
11. Terrestrial and Freshwater Ecosystems and Processes
12. Weather and Climate
ASM2 Theme 1 –
Key points from Ministers’ statement

- Expand cooperation in stock-taking of **societal benefits** of observations, moving from **design to deployment** of an integrated Arctic observing system (incl. **community-based observatories**)

- Cooperation with **Sustaining Arctic Observing Networks (SAON)** initiative, Copernicus & other major operational observing networks

- Enhance space-agency cooperation on Arctic-relevant missions

- Make Arctic research & monitoring datasets **available, discoverable, and relevant** for communities – work with Group on Earth Observations (GEO)

- Add versatility by exploring **new technologies** for autonomous observing systems & remote sensing
ASM2 Theme 1, SAON & AOS – Progress & direction

- Sustained Arctic observations provide shared benefits to Arctic & non-Arctic countries
- Collaboration requires mechanisms that fit & allow effective response
- SAON as a framework under IASC and Arctic Council, with AOS as an inclusive bottom-up forum & mechanism
- What is the current status?
VISION: A connected, collaborative, and comprehensive long-term pan-Arctic Observing System that serves societal needs.
SAON needs a common (Road) Map
VISION: A connected, collaborative, and comprehensive long-term pan-Arctic Observing System that serves societal needs.

GOALS: (from 2018 SAON Strategy)

1. Create a roadmap to a well-integrated Arctic Observing System; (Committee on Networks)
2. Promote free and ethically open access to all Arctic observational data; and (Arctic Data Committee)
3. Ensure sustainability of Arctic observing. (Task Team)
Need for Observing System

- Societal Benefits – Long & short term perspective (e.g., UN-SDG, emergency response)

System Implementation

- Funding/support models
- Optimization of existing platforms & technologies
- New technologies to increase efficiency & impact
- Role of data management

Operating Observing Systems

- Success stories & lessons learned
- Use
  - Use of data & information relevant for business case
  - Data Management in support of public and private interests
  - Technology in support of public and private interests
  - Entrepreneurship and sustained observations
Arctic Observing Summit (AOS) Goals

- Provide **community-driven, science-based** guidance for the **design, implementation, coordination** and **sustained long-term (decades) operation** of an international network of Arctic observing systems that serves a wide spectrum of needs

- Create a **forum** for coordination and exchange between **academia, government agencies, Indigenous & local communities, industry, non-governmental organizations and other Arctic stakeholders** involved in or in need of long-term observations
Key conclusions

• Incomplete and too unspecific tenders

• Standard operation procedures for sensors, data repository, data format, IP need to be resolved at start of project

• Clearer guidance from research community is needed for technology, sensor, infrastructure needs & gaps

• Clarity on whether research projects prioritize measurement hardware or data needs to be resolve early potential partnership between industry and academia

• Multi-lateral collaboration & consortium approaches need to be fostered in order to better integrate features / sensors / infrastructure
AOS Design, Optimization & Implementation WG: From benefits to networks

Themes

Societal benefits

Applications

Phenomena

Essential variables

Observing platforms

Observing networks

Data networks

Data networks
• Valuation methods to assess societal benefits of sustained observations have shown positive return on investment, motivating this call for action

• Urgent need to shift key observing system components from short-term research funding to sustained, operational infrastructure support

• Operational infrastructure must target key variables, augmented by broader set of research-focused variables
• Observing & data systems have to emerge from co-design, co-production, and co-management processes, embracing free, ethical, and open data sharing (FAIR principles: Findable, Accessible, Interoperable, Reusable)

• Arctic Observing System needs to span full range of spatial & temporal observation scales by combining multiple methods & technologies, including Indigenous knowledge, community-based monitoring & citizen science
- Comprehensive analysis of capacity and gaps in current systems, sensors, networks, and surveys
- “Knowledge map” connecting observation inputs to societal benefits can guide new observations, data management needs, product & service development
- International team of experts is needed to complete these tasks, generate roadmap, support implementation
- Task Team to operate under SAON/CON, drawing on AOS framework to provide (i) reach into different bodies of expertise & communities, (ii) pacing for products & deliverables, (iii) expertise to inform implementation of observing system
Achieving SAON/ASM/AOS goals

- Meta-Sensome ("knowledge map")
  - Parsing & synthesis
  - Ranking
  - Linking

- Arctic Observing Roadmap
  - Well-defined requirements for EVs
  - Societal benefits (shared)
  - Co-design/implement-ation/integration of observing system components

- Broad range of themes, interests, mandates, concepts, champions

- Refined approaches for individual observing efforts
- Such efforts underway mostly in isolation (only after the fact synthesis, not prior co-design)
- Bundling of efforts insufficient → Development of coherent set of observations drawing on requirements guided by shared benefits
- Identify commonalities & link requirements & implementation across narrow efforts that fit into common thematic framework
Next Steps

(1) Transform AOS into process under SAON (CON) that advances roadmap & helps initiate observations filling critical gaps
(2) Develop a workplan under SAON for (1)
(3) Stand up task team through international collaborative efforts to execute (2)
(4) Fold task team efforts into AOS 2020 and beyond
Potential role of Arctic Science Ministerials in the context of sustained Arctic observing
- SAON may provide governance framework for observing system
- AOS is a mechanism & forum to advance SAON goals and achieve desired outcomes, specifically on system co-design, optimization & implementation
- AOS (spring 2020ff.) and ASM (fall 2020) are currently in phase
- ASM presents an executive-level mechanism to jointly review and address challenges identified by AOS & SAON, such as lack of suitable co-funding mechanisms, need for internationally coordinated large-scale infrastructure commitments, evolving international treaty systems (e.g., CAO Agreement)
- Is AOS a mechanism to digest and present very small set of urgent issues to governments active in Arctic research & observing?
- If so, what is needed now to allow ASM to fulfill its promise?