

# 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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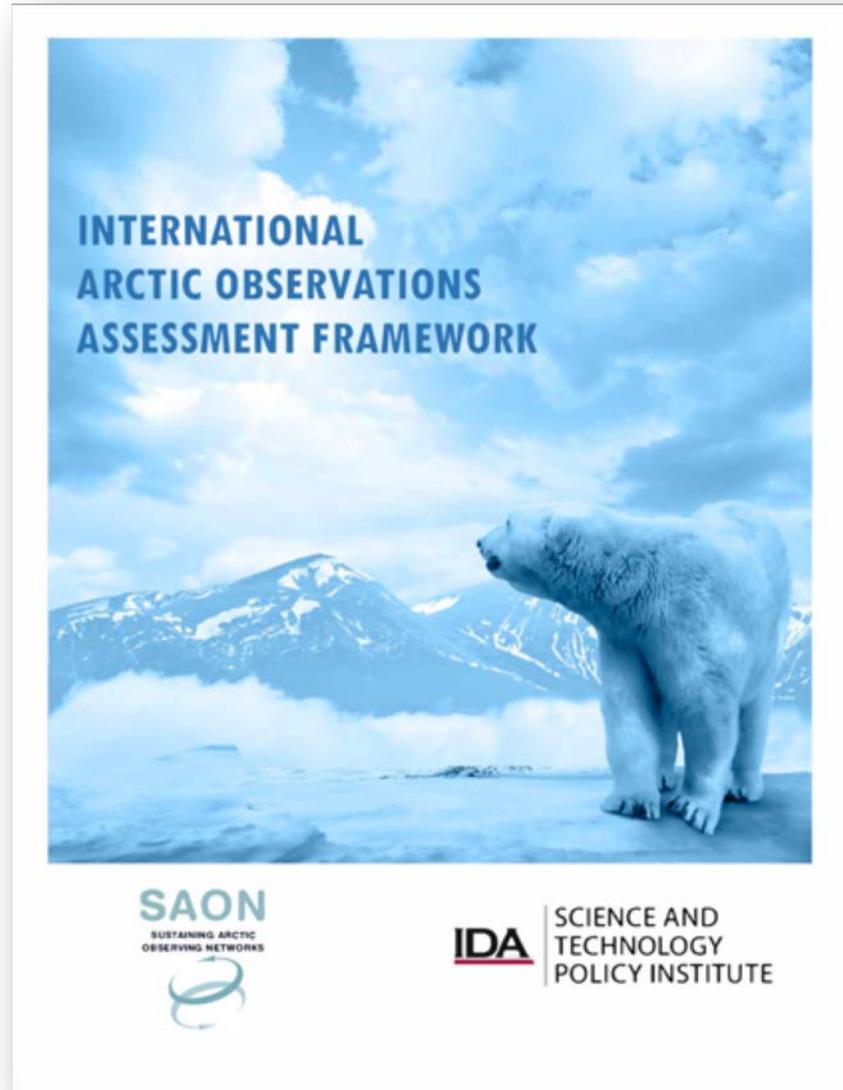
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# ASM1 - Example of specific outcome informing ASM2



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

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- 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

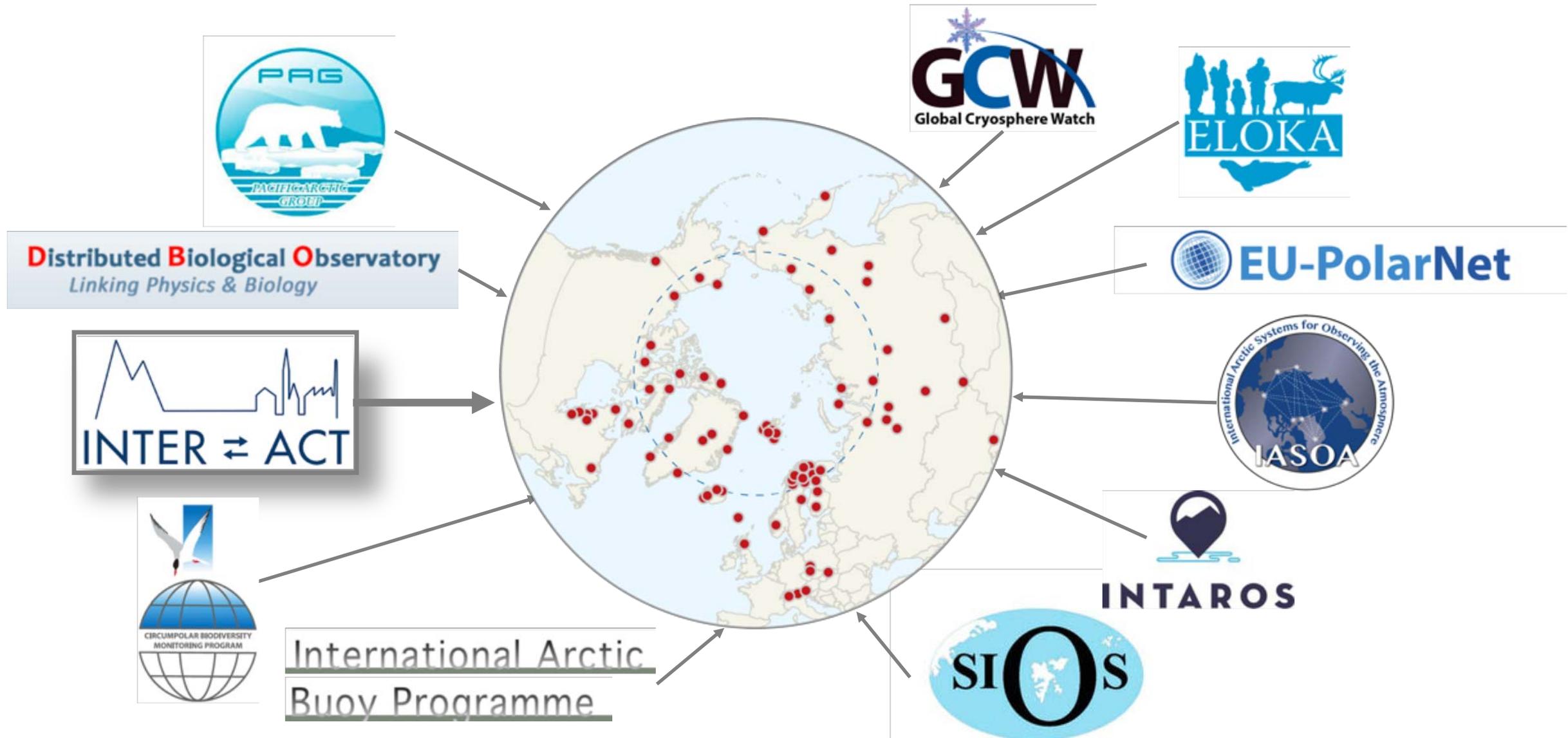
# ASM2 Theme 1, SAON & AOS – Progress & direction

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- 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

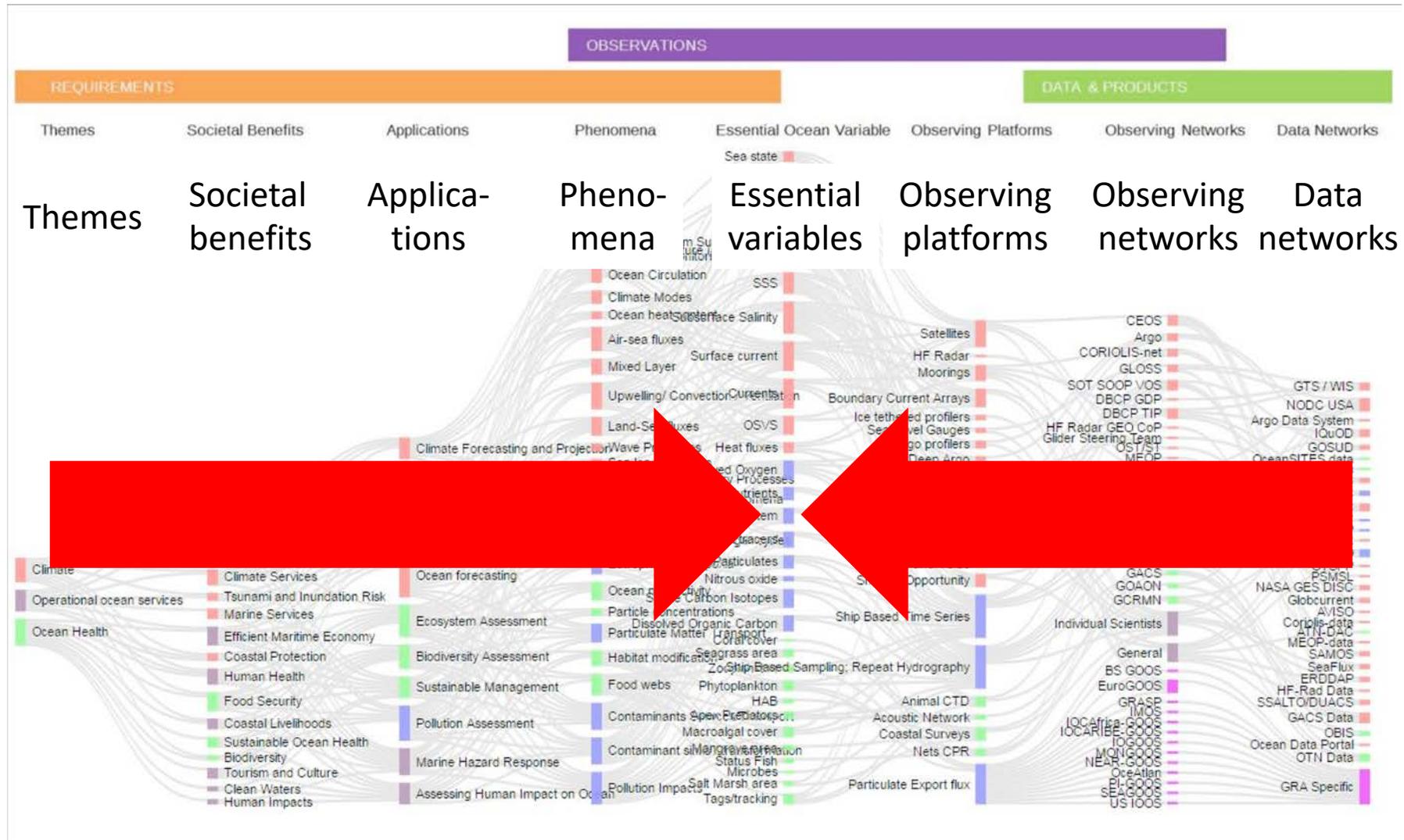
# AOS WG2: Private sector partnerships



## 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



# AOS → ASM2 → ... | Call to Action



- 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

# AOS → ASM2 → ... | Call to Action



- 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

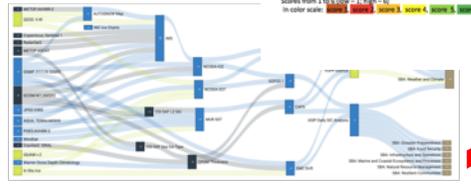
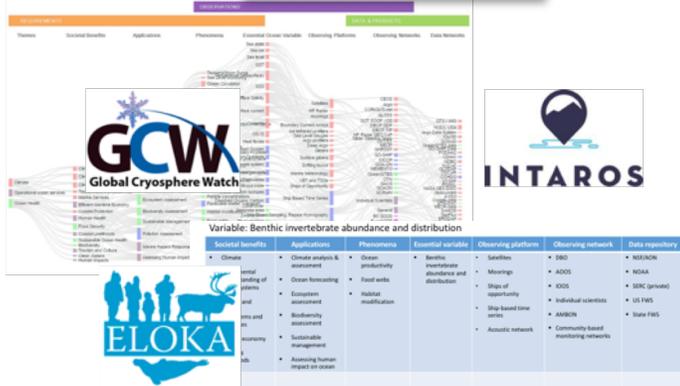
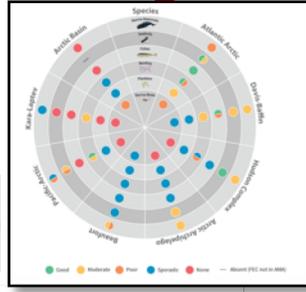
# AOS → ASM2 → ... | Call to Action



- 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

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



## Meta-Sensome ("knowledge map")

- Parsing & synthesis
- Ranking
- Linking

## Arctic Observing Roadmap

- Well-defined requirements for EVs
- Societal benefits (shared)
- Co-design/implementation/integration of observing system components

- 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

# [AOS → SAON] ↔ ASM



- 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 ASM3 to fulfill its promise?