Shared Arctic Variables

an observing coordination framework designed for the Arctic

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SAV paper team (AB, HE, Olivia Lee, Anna Gebruk, Roberta Pirazzini)

SAON ROADS Advisory Panel

2022 Arctic Observing Summit Working Group 4

2020 Arctic Observing Summit Working Group 1

ROADS Task Force



Shared Arctic Variables Sharing is caring.

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Why do anything?

- Arctic observing is complicated
 - Many nations,
 - many economic interests,
 - many research/operational agencies,
 - many Indigenous communities, and
 - multiple knowledge systems and worldviews.
- SAON has been tasked with dealing with this
 - The Roadmap for Observing and Data Systems is the "how"

What does an Arctic Observing System need to accomplish?

- Get information to the people who need it to make decisions lacksquare
- Make full use of the observing resources we have \bullet
 - Include many types of observations (CBM, Indigenous Knowledge, scientific obs)
 - Flexible technology requirements
- Recognize that processes in the Arctic are interconnected
- Makes data and information products available to users



Other models for organizing information Essential Variable



Other models for organizing information **Station model**





Other models for organizing information **Central Question**



SEDGLAM Global Agricultural Monitoring

. Observing system facilitates sharing of information and best practices





Do these models meet the needs of the Arctic?

	Information users define requirements	Include many observation approaches
Essential Variable		
Station model		
Central question		



Shared Arctic Variables

<u>Shared</u>: Developed through a process of co-design and sustained partnerships, inspired by an intersection of interests related to how observations will be used in support of broadly shared societal benefit.

<u>Arctic</u>: A diversely defined region where specific phenomena and considerations drive observing requirements that are distinct from global requirements.

<u>Variables</u>: Observable phenomena (from both scientific processes and Indigenous Knowledge Systems) that are critical for characterizing a system and its changes; parsed into more granular observable properties.





community based

measurement

Scientists

operational Agencies

Indigenous experts

Shared need for information regarding an observable

Requirements

Observers

Observing requirements may vary



In Situ scientific measurements

Requirements

Indigenous knowledge



Example SAV: coastline position

Satellite-based observation

Needed for documenting large scale erosion patterns

Relevant to:

- Coastal villages for near and long-term planning
- State agencies
- Commercial interests and infrastructure

High spatial resolution coastline maps as needed (e.g., following major storms)

Relevant to:

- response
- State agencies

In Situ scientific measurements

• Community planners

Emergency and disaster

Environmental remediation

Indigenous knowledge

Long-term knowledge of what areas of coastline are prone to erosion

Relevant to:

- Deciding how and where to relocate villages
- Planning for new construction/infrastructure



Example SAV: coastline position

(this is just an example please don't read too much into it!)

User group	Satellite-based observations	Local 'scientific' observations	Indigenous Knowledge
Indigenous community leaders			
State agencies			
Insurance companies			
Commercial interests and infrastructure			
Scientists			

The process is half the product

- Final product
 - Documented high-value observing needs
 - Requirements for observations, data systems, and information products to be useful
- Process
 - Creates a community of practice
 - Builds relationships between observers and information users

Do these models meet the needs of the Arctic?

	Information users define requirements	Include many observation approaches
Essential Variable		
Station model		
Central question		
Shared Arctic Variables		



The Expert Panel Process

Core expert panel group:

3 Indigenous and other experts set scope of panel theme, drafts initial Shared Arctic Variables proposal, and proposed expert panel composition.

Research assistant: Supports expert panel work through reviewing existing efforts and other tasks.

Expert panel:

10-12 experts representing a range of information user and observer perspectives determine SAVs where there is common need, draft the detailed proposal with specific observing requirements.

ROADS Advisory Panel:

Voluntary advisory panel representing international, Indigenous, and disciplinary perspectives guides expert panels through the process, including in composition of the expert panel and documentation development.

Widespread review:

Constructive feedback on the SAV requirements is solicited from the observing, user, and Indigenous communities.



My vision

- Research vessel in the Bering Sea can make measurements that will help communities relying on salmon in the Yukon river.
 - Researchers don't know what information is needed
 - Arctic is a big place, also an interconnected place
 - Observations don't always happen in the same place as the people who need them
 - Indigenous communities can be overrun with scientists wanting to be helpful but not knowing how

More information

- ROADS Advisory Panel
- Webinar
- One- and two-page versions
- Pilot efforts (Arctic PASSION and **RNA** CoObs)
- Peer-reviewed documentation

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SUSTAINING ARCTIC **OBSERVING NETWORKS**









College





