

Third Arctic Science ministerial Webinar Series



Co-hosted by Iceland and Japan

This webinar series is a cooperation between the ASM3 Organizers in Iceland and Japan and the European Polar Board.





Third Arctic Science Ministerial Webinar Series

Theme 1: Observe

*Observing networks; Data sharing
- towards implementation*

20 January 2021

16: 00 - 17: 00 UTC

Program here! ► <https://asm3.org>

Welcome

Hiroyuki Enomoto and Embla Eir Oddsdóttir

ASM3 Science Advisory Board Co-Chairs



Third Arctic Science Ministerial

ASM3

Tokyo, Japan
08-09 May 2021



Government of Iceland
Ministry of Education,
Science and Culture



MEXT

MINISTRY OF EDUCATION,
CULTURE, SPORTS,
SCIENCE AND TECHNOLOGY-JAPAN



The ASM3 Organizing Committee

Japanese Ministry of Education, Culture, Sports, Science & Technology (MEXT)

- KONO Hiroyuki
- KIMURA Hajime

Japanese National Institute of Polar Research

- KODAMA Yuji
- SUEYOSHI Tetsuo

Icelandic Ministry of Education, Science & Culture

- Ásgerður Kjartansdóttir
- Lindsay Elizabeth Arthur



The ASM3 Science Advisory Board

The Science Advisory Board (SAB) supports the Organizing Committee with their expertise. The SAB will provide consultation on the development of the ASM3 **Science Summary** as well as the **Joint Statement**. The SAB reflects the ASM3 values: transparency, inclusiveness and engaging in a bottom-up approach to science.

- Icelandic Representative: Embla Eir Oddsdóttir
- Japanese Representative: Hiroyuki Enomoto
- AOS Representative: Hajo Eicken
- APECS Representative: Mia Bennett
- ASM1 Representative: Fran Ulmer
- ASM2 Representative: Karin Lochte
- IASC Representative: Henry Burgess
- IASSA Representative: Andrey Petrov
- Indigenous Arctic Knowledge Holder Representative: Liza Mack
- Indigenous Science Representative: Eva Kruemmel
- SAON Representative: Sandy Starkweather
- UArctic Representative: Arja Rautio

Ex Officio

- Jenny Baeseman (Science Consultant)
- Hajime Kimura (MEXT)
- Lindsay Elizabeth Arthur (MRN)
- Þorsteinn Gunnarsson (RANNÍS)
- Yuji Kodama (NIPR)
- Tetsuo Sueyoshi (NIPR)

ASM3 Participants

Participants

28 Countries/governments: Austria, Belgium, Canada, China, the Kingdom of Denmark, Faroe Islands, Finland, France, Germany, Greenland, Iceland, Italy, Japan, Malaysia, Netherlands, Norway, Poland, Portugal, Republic of Korea, Russian Federation, Sweden, Singapore, Switzerland, Spain, Thailand, the United Kingdom, the United States, European Commission

6 Arctic Indigenous representatives: Aleut International Association (AIA), Arctic Athabaskan Council (AAC), Gwich'in Council International (GCI), Inuit Circumpolar Council (ICC), Russian Association of Indigenous Peoples of the North (RAIPON), Saami Council

16 International Organizations: AMAP, APECS, CAFF, GEO, IASC, IASSA, ICES-PICES, INTERACT, IPS, PAME, PEI, SAON, SDWG, UArctic, UNEP, WMO

ASM3 Webinar series

This webinar series is designed to increase transparency of the Arctic Science Ministerial science process and to provide additional opportunities for scientists, Indigenous Peoples and Arctic research stakeholders to further engage with the science and proposed actions leading up to the Third Arctic Science Ministerial in Tokyo, Japan in May 2021.

The webinar series is a joint cooperation between the ASM3 Organizers in Iceland and Japan and the [European Polar Board](#) .

Each webinar will be shared afterwards on the European Polar Board YouTube page and a written summary will be made available on the ASM3 website.

Introductory Webinar

Date: 21 October 2020, 13:00 UTC

- Opening Remarks by Minister Lilja Alfreðsdóttir, Iceland
- Introduction of the European Polar Board by Renuka Badhe
- Review of ASM1 by Fran Ulmer
- Review of ASM2 by Karin Lochte
- Introduction to ASM3
- Questions & Answers



Indigenous Peoples' Participation in the ASM3 Process —Contributions to Arctic Science and Research

Date: 03 December 2020, 13:00 UTC

This webinar brought together a panel of Indigenous Leaders to discuss the upcoming Arctic Science Ministerial. They discussed the importance of inclusion of the knowledge of Indigenous peoples in Arctic science and research and the important role this has on sustainability. They provided a background of previous efforts and shared their insights around the question “Why is it important for Indigenous Peoples to be involved in Arctic science and research?”

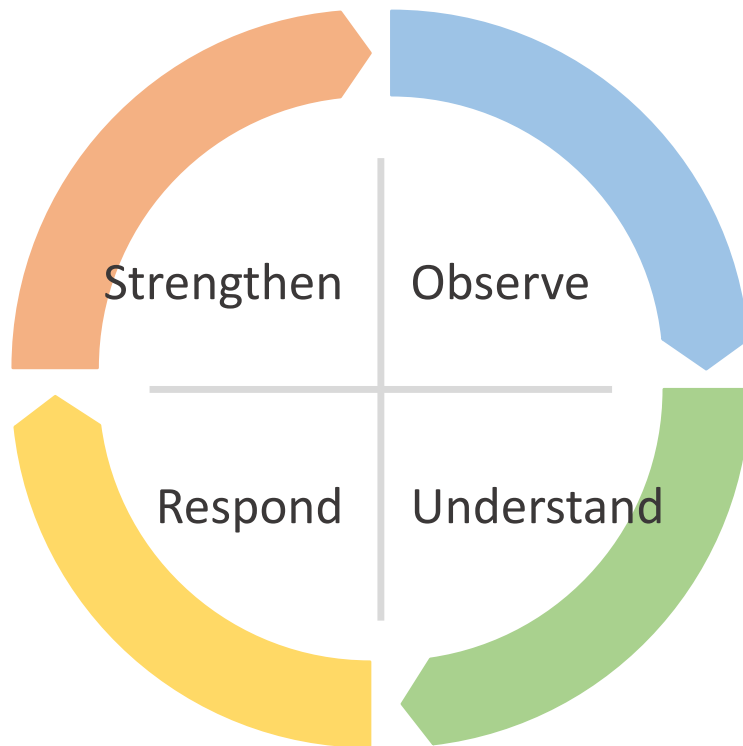
The discussion from this webinar will form the basis for recommendations reflected in the ASM3 final report.

ASM3 Theme-based Webinars

Dates: 20 January, 17 February, 17 March, 07 April 2021

“Knowledge for a sustainable Arctic”

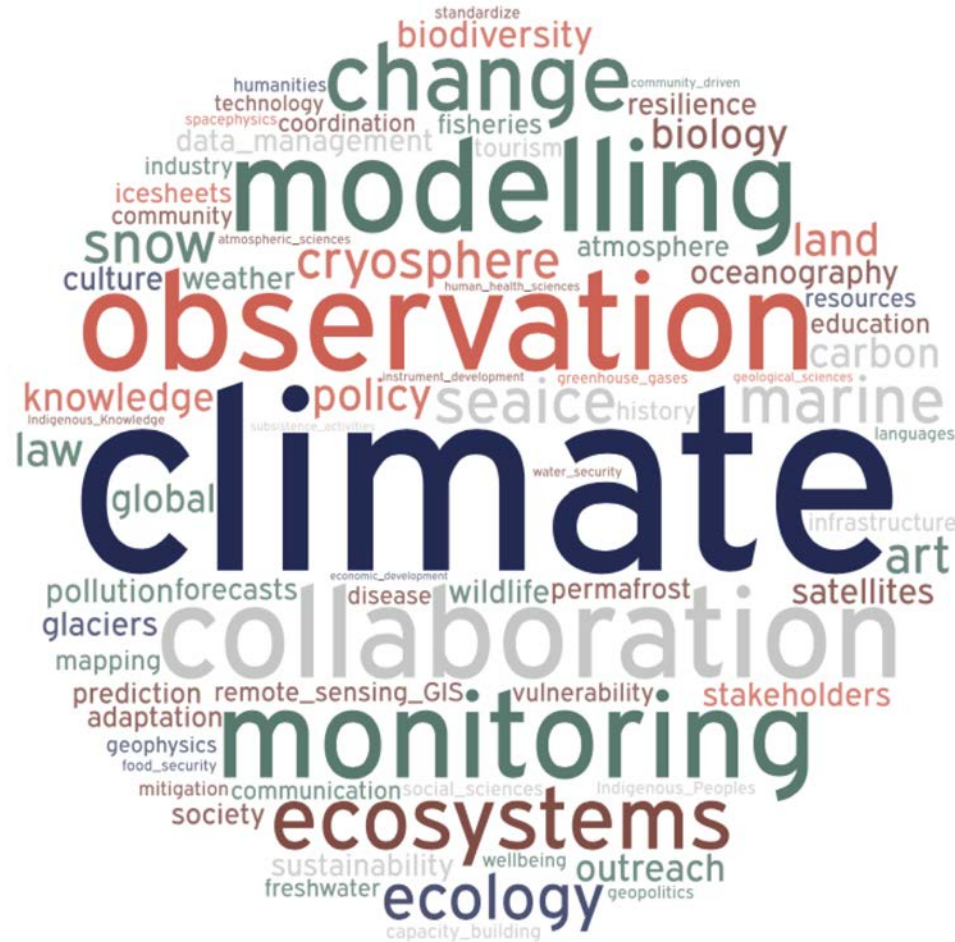
Observe, Understand, Respond, and Strengthen: 4-step iterative cycle



Structure of each webinar

- Introduction to the Theme
- Progress since ASM2
- Project Highlights
- Proposed Actions
- Moderated Discussion

Overview of Project Submissions



174 Project Updates
252 New Projects

Arts_Humanities
Indigenous_Knowledge
Outreach
Natural_sciences
Social_sciences
Community_driven
Education_Capacity_Building

Themes of ASM3

“Knowledge for a sustainable Arctic”

Observe, Understand, Respond, and Strengthen: 4-step iterative cycle



- 1. Observe** 20 January 1600 UTC
Observing networks; Data sharing
– towards implementation
- 2. Understand** 17 February 1300 UTC
Enhance understanding and prediction capability on Arctic environmental and social systems and its global impact
- 3. Respond** 17 March TBD
Sustainable development; Evaluation of vulnerability and resilience; Application of knowledge
- 4. Strengthen** 7 April 1300 UTC
Capacity building; Education; Networking; Resilience
– prepare the next generation

Theme 1: Observe

Overview of Theme 1: Observe – Progress since ASM2 and Upcoming Projects

- Hajo Eicken, ASM3 Science Advisory Board Member

Highlights from Theme 1: Observe

- Synoptic Arctic Survey (SAS)
 - Øyvind Paasche, Bjerknes Centre for Climate Research and NORCE, Chair of SAS Scientific Steering Committee
- Mapping the Arctic: Filling Gaps in the Arctic Geospatial Foundation to Support Research & Sustainability
 - Ashley Chappell, NOAA
- GLIDER. Unmanned ocean vehicles, a flexible and cost-efficient offshore monitoring and data management approach
 - Salve Dahle, Akvaplan-niva
- Atlas of Community-Based Monitoring & Indigenous Knowledge in a Changing Arctic
 - Noor Johnson, in cooperation with Inuit Circumpolar Council
- Arctic Biodiversity Data Service (ABDS) and Circumpolar Biodiversity Monitoring Programme
 - Catherine Coon, CBMP Co-Chair

Recommended Actions to Increase International Observations and Data Sharing

- Sandy Starkweather, ASM3 Science Advisory Board Member

Question and Answer Session

Overview of Theme 1: Observe – Progress since ASM2 and Upcoming Projects

Hajo Eicken (ASM3 Science Advisory Board Member)

International Arctic Research Center

University of Alaska Fairbanks

Fairbanks, AK, USA

*With contributions by fellow-SAB members,
Jenny Baeseman & ASM3 Organizing Team*

Outline

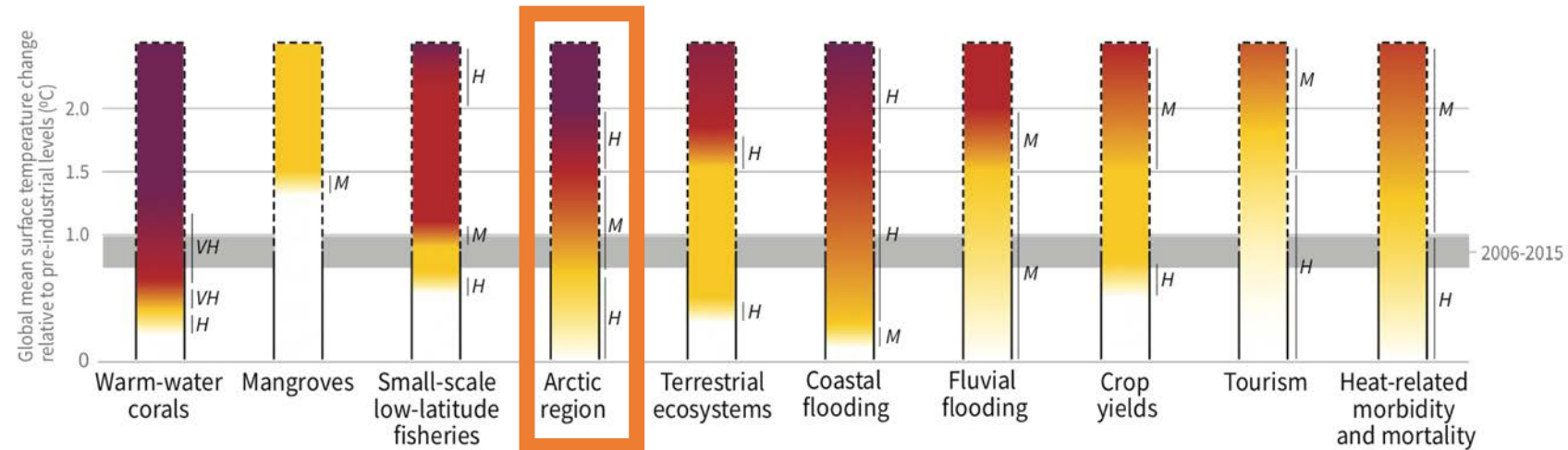
- Relevance & urgency of observations of Arctic change
- Relevance & urgency of ASM
- Progress since ASM2
- Submissions to ASM3



IPCC Special Report 15 (2018):

- Arctic region is unique & threatened system; at 1.5 °C global warming:
 - Severe & widespread impacts/risks
 - Potential for significant irreversibility & persistence of climate-related hazards
 - Global repercussions – e.g., impacts on sealevel & coastal flooding

Impacts and risks for selected natural, managed and human systems

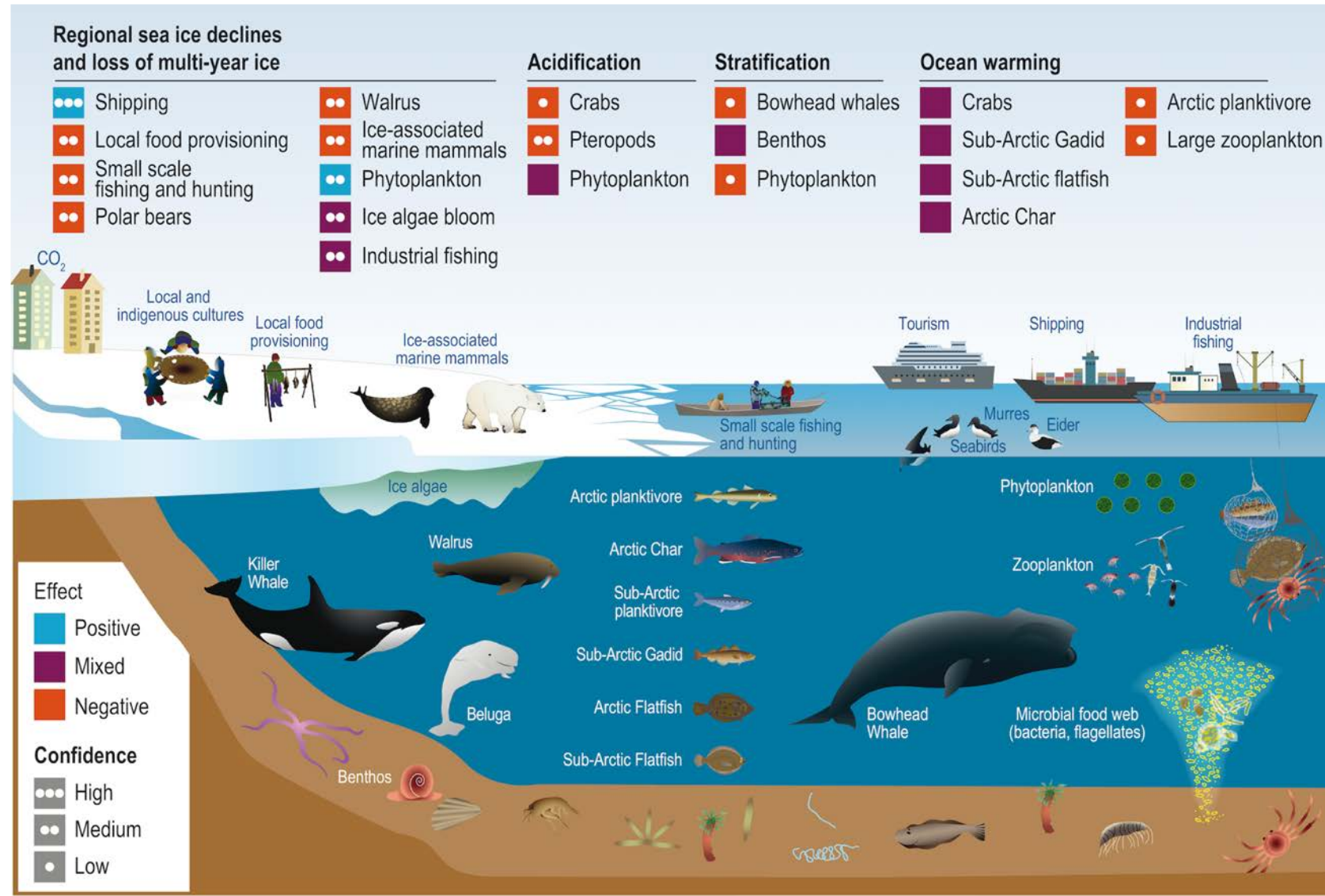


Confidence level for transition: L=Low, M=Medium, H=High and VH=Very high

Observing Arctic change: Relevance & urgency

IPCC Special Report on Oceans & Cryosphere (2019):

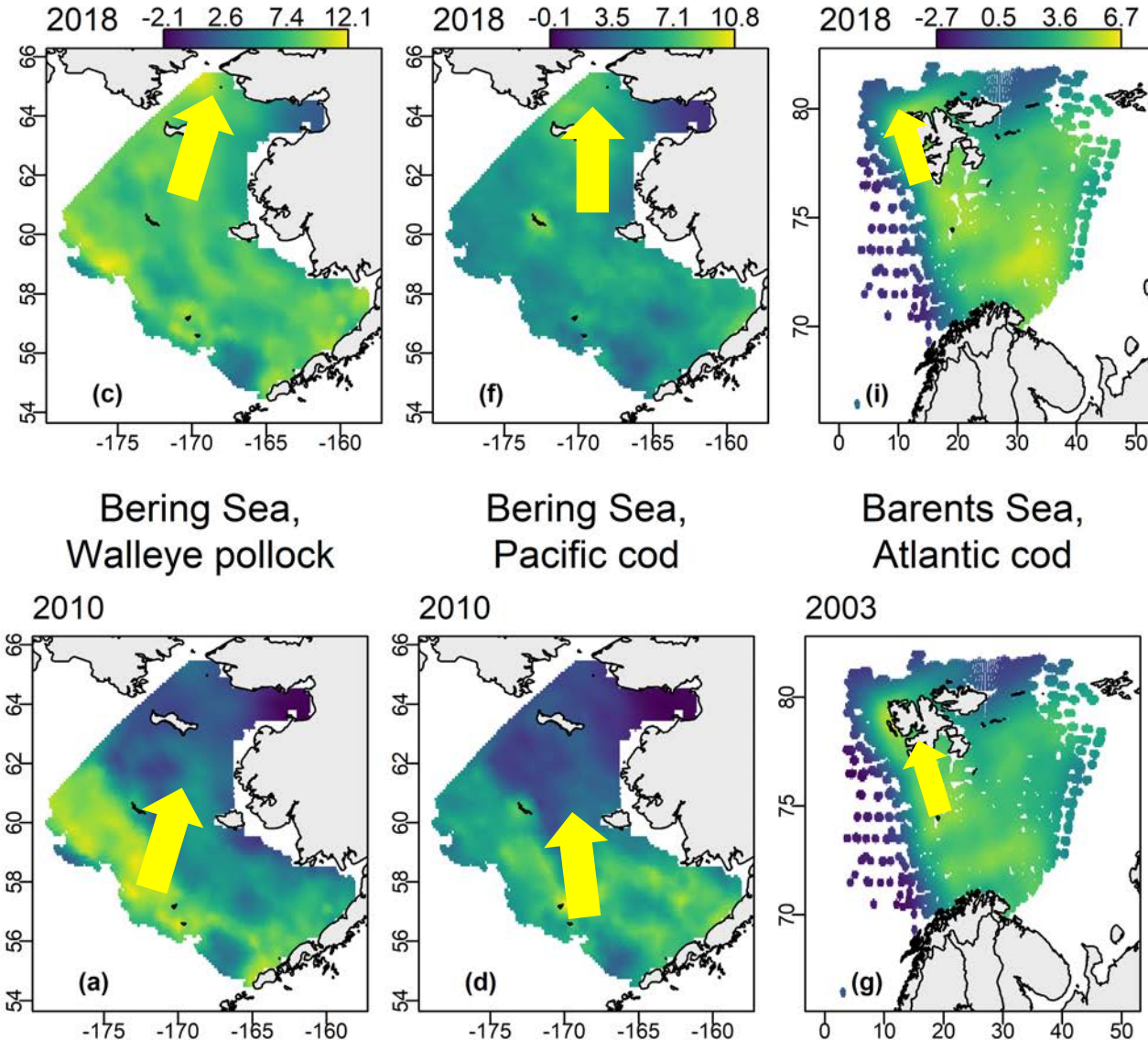
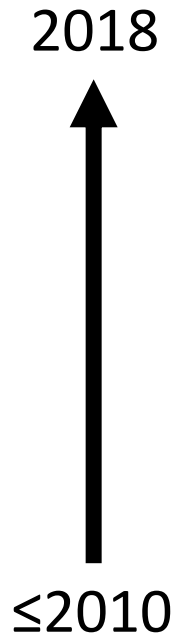
- Response options can lessen impacts of change, build resilience and allow time for effective mitigation measures
- Institutional barriers presently limit efficacy of responses
- Response capacity of polar governance systems recently strengthened, but not rapid or robust enough to address challenges & risks posed by projected changes



Observing Arctic change: Relevance & urgency

NOAA Arctic Report Card, Thorson et al. & Slats et al. (2019):

- US, Norwegian & Russian joint assessment highlights **northward shift of commercially important fish species in Barents & Bering Sea**
- Record low sea ice, ocean warming with loss of Bering Sea “cold pool” drives major ecosystem shifts and impacts Indigenous coastal communities



Community-driven & community-based observing networks

- Indigenous experts & observers track changing & degrading ice, ocean & coastal environments
- For example, Iñupiat experts in Alaska highlight intertwined impacts of sea-ice loss, ocean warming, and changing weather patterns
- For example, in Svalbard, permafrost degradation & changes in precipitation patterns have increased landslide risks

What do the observations say?

AAOKH observations focus on sea ice, wildlife and coastal waters. They contribute to, and are stored in, a National Science Foundation-funded Exchange for Local Observations & Knowledge of the Arctic database (eloka-arctic.org/sizonet). Since 2016, AAOKH observers have contributed nearly 3,000 community-based observations. These are combined with the historic Seasonal Ice Zone Observing Network database (2006–2016) for a total of over 7,500 local observations.

Fall themes

- +🌡️ Warm air & ocean
- 🌨️ Late freeze-up
- 🌊 Open water, big waves
- 🌪️ Strong winds
- 🏖️ Shoreline erosion
- 🐳 Longer whaling

Winter themes

- 🌡️ Cold temperatures
- 🏠 Thick sea ice
- 🗨️ Low quality ice

Wainwright



Wainwright

October–November “Late fall freeze-up of ocean, warm weather and strong swells.”

November 25, 2019 “Early fall weather in November and slush on ocean.”

Steven Patkotak, AAOKH observer

Point Hope



Guy Omnik,
Steven Patkotak & others
(Hauser & McFarland, eds.;
<https://arctic-aok.org>)

Point Hope

October 4, 2019 “40°F. Rain all night and morning. Here’s a picture from 2011 on today’s date. I had my net under the ice. Look like the ice was almost 4 inches. From that date till now freeze-up is later and later.”



October 25, 2019 “North beach swells 15-20 feet... Past two years the waves took two ice cellars.”

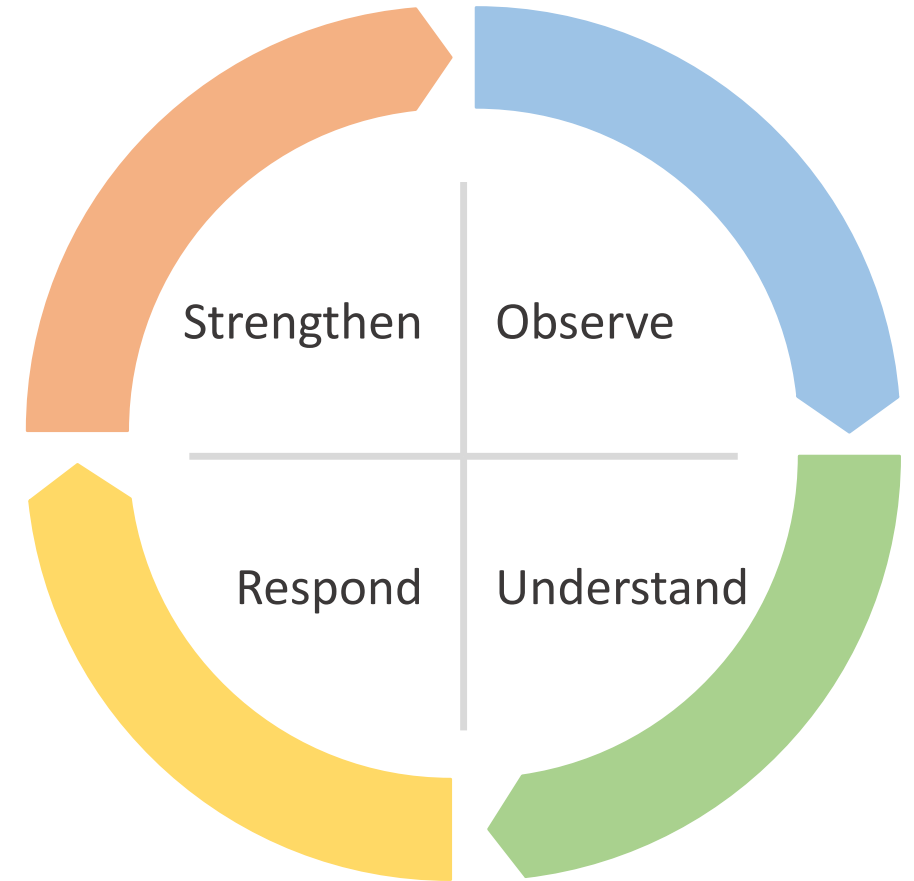
November 26, 2019 “Strong winds last night, wind gust to 60+ mph. Old buildings blowing away, peoples roofing blew off last night. South side beach filled with slush.”

Kotzebue

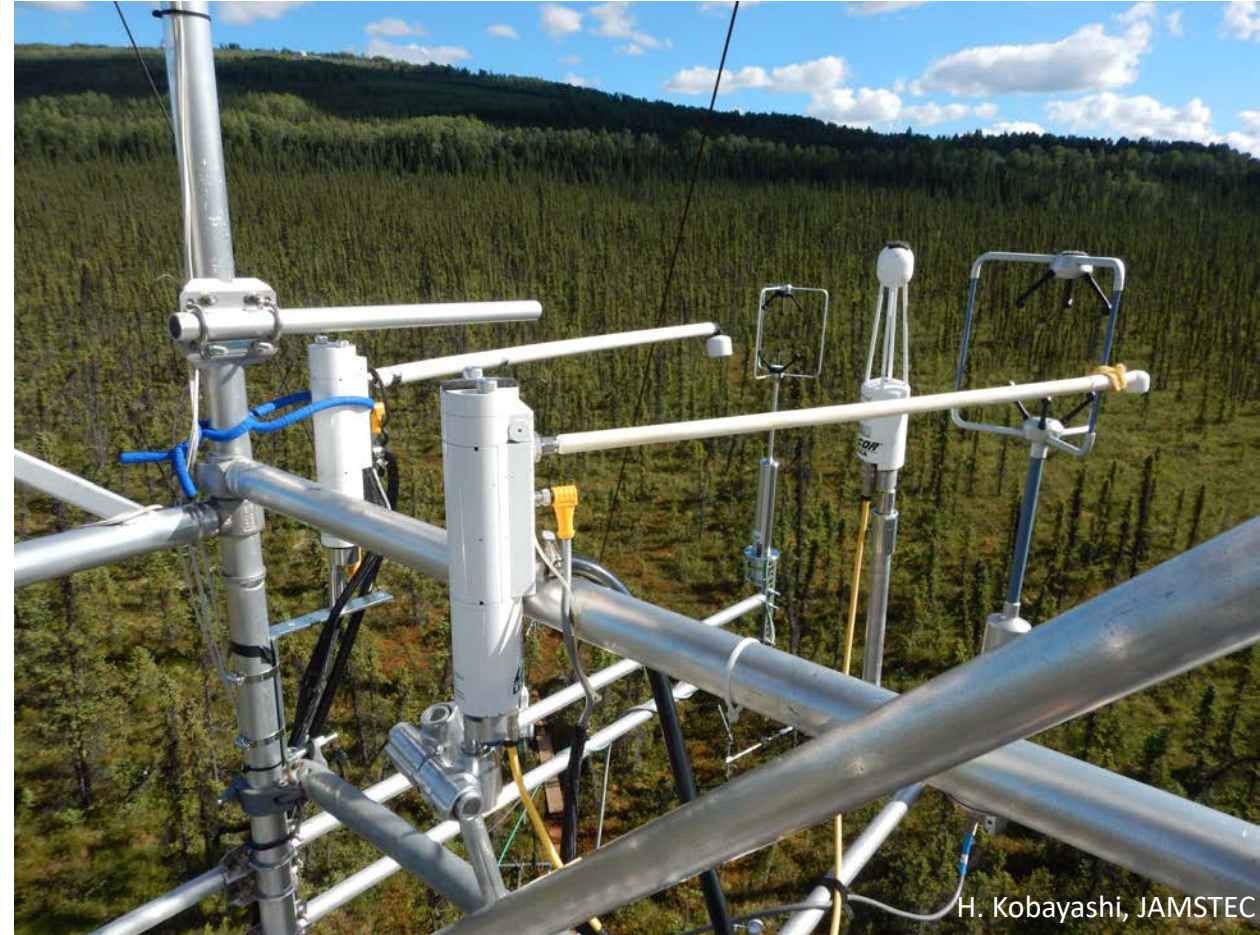


Observing Arctic change: Relevance & urgency of Arctic Science Ministerials

- Rapidity of change: Conventional response, research & governance mechanisms inadequate
- Responses & adaptation by Indigenous Peoples taxes Arctic communities & calls for capacity building
- Transboundary & global impacts require internationally collaborative approaches focused on shared benefits
- Executive level government attention & support, focused into high-priority themes & initiatives
- Iterative & rapidly adaptive approaches needed



- Alignment of coordination & collaboration activities central to Observing:
 - 2018: ASM2
 - 2019-2020: Arctic Observing Summit (AOS) Working Group & Sustaining Arctic Observing Networks (SAON) Committee alignment & exchange
 - 2020: Defining SAON Roadmap for Arctic Observing & Data Systems (ROADS)
 - 2020: AOS & Arctic Science Summit Week (ASSW)
 - 2021 Arctic Science Ministerial (ASM3)



Progress since ASM2: Alignment & collaboration



- Alignment of coordination & collaboration activities central to Observing:
 - 2018: ASM2
 - 2019-2020: Arctic Observing Summit (AOS) Working Group & Sustaining Arctic Observing Networks (SAON) Committee alignment & exchange
 - 2020: Defining SAON Roadmap for Arctic Observing & Data Systems (ROADS)
 - 2020: AOS & Arctic Science Summit Week (ASSW)
 - 2021 Arctic Science Ministerial (ASM3)

- AOS as a community-driven effort to foster coordination & collaboration for sustained observations of Arctic change (<https://arcticobservingsummit.org/>)
- Six Working Groups include
 - Observing system design & implementation (→links to SAON CON)
 - Data Interoperability & Federated Search (→links to SAON ADC)
 - Indigenous Food Security
 - Arctic & Global Observing Initiatives

- Alignment of coordination & collaboration activities central to Observing:
 - 2018: ASM2
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 - 2020: Defining SAON Roadmap for Arctic Observing & Data Systems (ROADS)
 - 2020: AOS & Arctic Science Summit Week (ASSW)
 - 2021 Arctic Science Ministerial (ASM3)



SAON Roadmap for Arctic Observing & Data Systems:

- Focused First on the Highest Impact Observables
- Structured for Coordinated & Equitable Engagement
- Aligned with Existing Mechanisms

Inventories

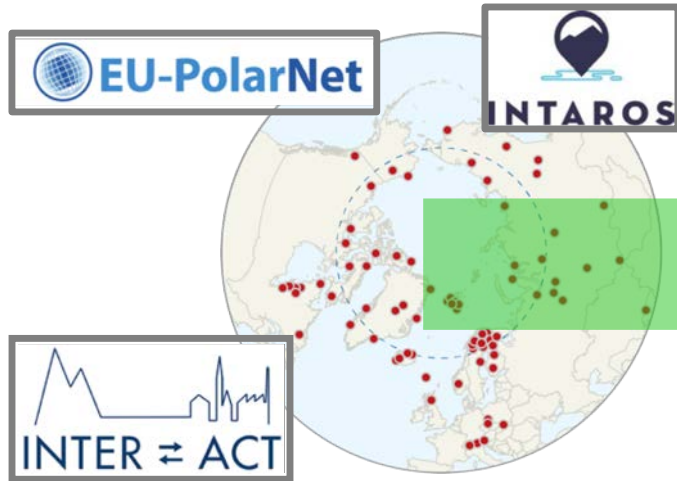
(e.g., INTAROS & others, SAON Committee on Observations & Networks)

Societal Benefit/Value Tree Analyses

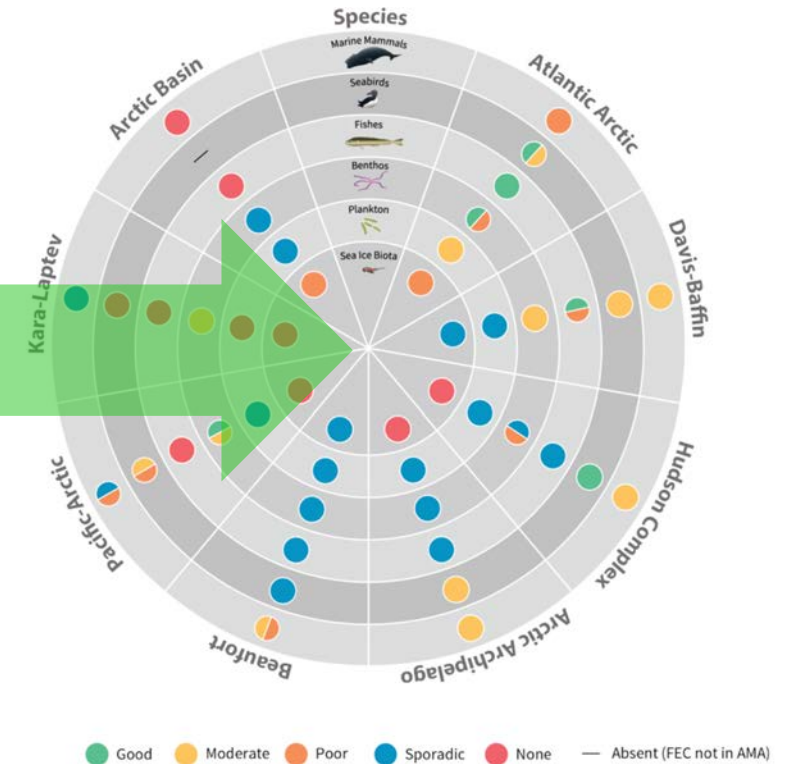
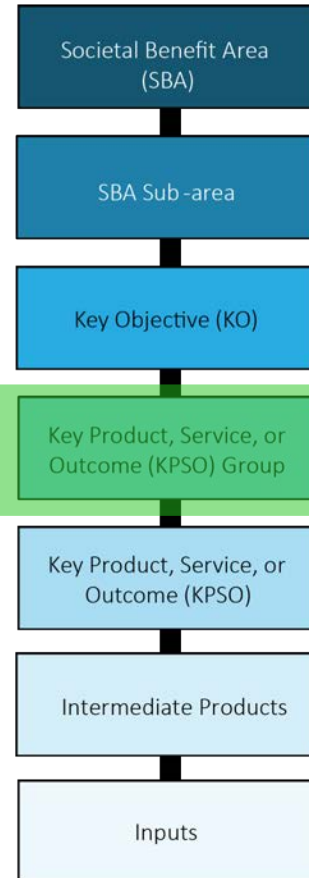
(e.g., STPI, 2017; Dobricic et al.; 2018; Strahlendorff et al., 2019; Shibata, Harada et al., 2019; Starkweather et al., 2020)

Essential Variable Frameworks

(e.g., Circumpolar Biodiversity Monitoring Program, CBMP)



SAON ROADS



- Coordination frameworks & support
 - SAON ROADS
 - Funders Forum
- Individual projects & initiatives
 - INTAROS
 - MOSAiC
- Observing infrastructure
 - New Arctic research vessels (e.g., China's Xuelong 2)
 - New research stations (e.g., Russia's planned Snowflake International Arctic Station)
- Sustained large-scale observing & data management efforts
 - National Arctic/Polar Institutes & Data Centers: e.g., Japan's NIPR/ADS; Korea's KOPRI; Germany's AWI; Svalbard Integrated Earth Observing System
- Engagement and involvement of Indigenous Peoples of the Arctic
 - Food Security & Food Sovereignty Framework (Inuit Circumpolar Council - Alaska)
 - Indigenous-led observing efforts

Progress since ASM2 & Upcoming projects – Perspectives on submissions to ASM3

- Contributions to ASM3
 - 158 observing-related submissions (both self-declared & SAB assigned)
 - Broad range of submissions from single-investigator projects to large networks
 - Different types of submissions indicate wider range of interpretation of relevance

Categories

Keywords

Submitter/collaborator

Study area

Education_Capacity_Building
Community_driven
 Outreach
Natural_sciences
Indigenous_Knowledge
 Social_sciences
 Arts_Humanities

biodiversity
 oceanography
collaboration
 remote_sensing_GIS
monitoring
observation
climate
modelling
 cryosphere
 satellites

France
 Denmark
 Greenland
Canada
 United_States
Norway
 Russia
 Germany
 Sweden

NorthPacificOcean
 CentralArcticOcean
AlaskanArctic
RussianArctic
 NorwegianArctic
Svalbard
GeneralArctic
Greenland
ArcticOcean
 SubArctic
 ChukchiSea

Submissions to ASM3 – A closer look at observing projects

- One quarter of submissions affiliated with observing networks
- Ready access to data not universal
- One third of submissions not directly tied to structured observing approaches
- Comparatively few efforts with Indigenous leadership/participation

<i>Category</i>	<i>Number of submissions</i>	<i>Comments</i>
A: Observing network	37	31 regional; 6 global; incl. single observing campaigns if networked
B: Long-term obs. <i>potential</i>	33	Includes entries from A
C: Data/Data products readily accessible	29	Data are directly accessible online (6 provide derived data products for applications)
D: International effort	28	
E: Indigenous/community involvement/leadership	11	9 projects with Indigenous involvement or leadership
F: Observing support or service initiative	26	Observing infrastructure, data portals etc.
G: Others	67	No clear link to structured observing
H: Total	158	Self-declared & assigned to observing category (multiple entries in A-F possible)

Highlights from Theme 1: Observe

Moderated by Hajo Eicken, ASM3 Science Advisory Board Member

- **Synoptic Arctic Survey (SAS)**
 - Øyvind Paasche, Bjerknes Centre for Climate Research and NORCE, Chair of SAS Scientific Steering Committee
- **Mapping the Arctic: Filling Gaps in the Arctic Geospatial Foundation to Support Research & Sustainability**
 - Ashley Chappell, NOAA
- **GLIDER. Unmanned ocean vehicles, a flexible and cost-efficient offshore monitoring and data management approach**
 - Salve Dahle, Akvaplan-niva
- **Atlas of Community-Based Monitoring & Indigenous Knowledge in a Changing Arctic**
 - Noor Johnson, in cooperation with Inuit Circumpolar Council
- **Arctic Biodiversity Data Service (ABDS) and Circumpolar Biodiversity Monitoring Programme**
 - Catherine Coon, CBMP Co-Chair

- **Recommended Actions to Increase International Observations and Data Sharing**
 - Sandy Starkweather, ASM3 Science Advisory Board Member
- **Question and Answer Session**

Synoptic Arctic *Survey*



Øyvind Paasche

Bjerknes Centre for Climate Research and NORCE,
Chair of SAS Scientific Steering Committee

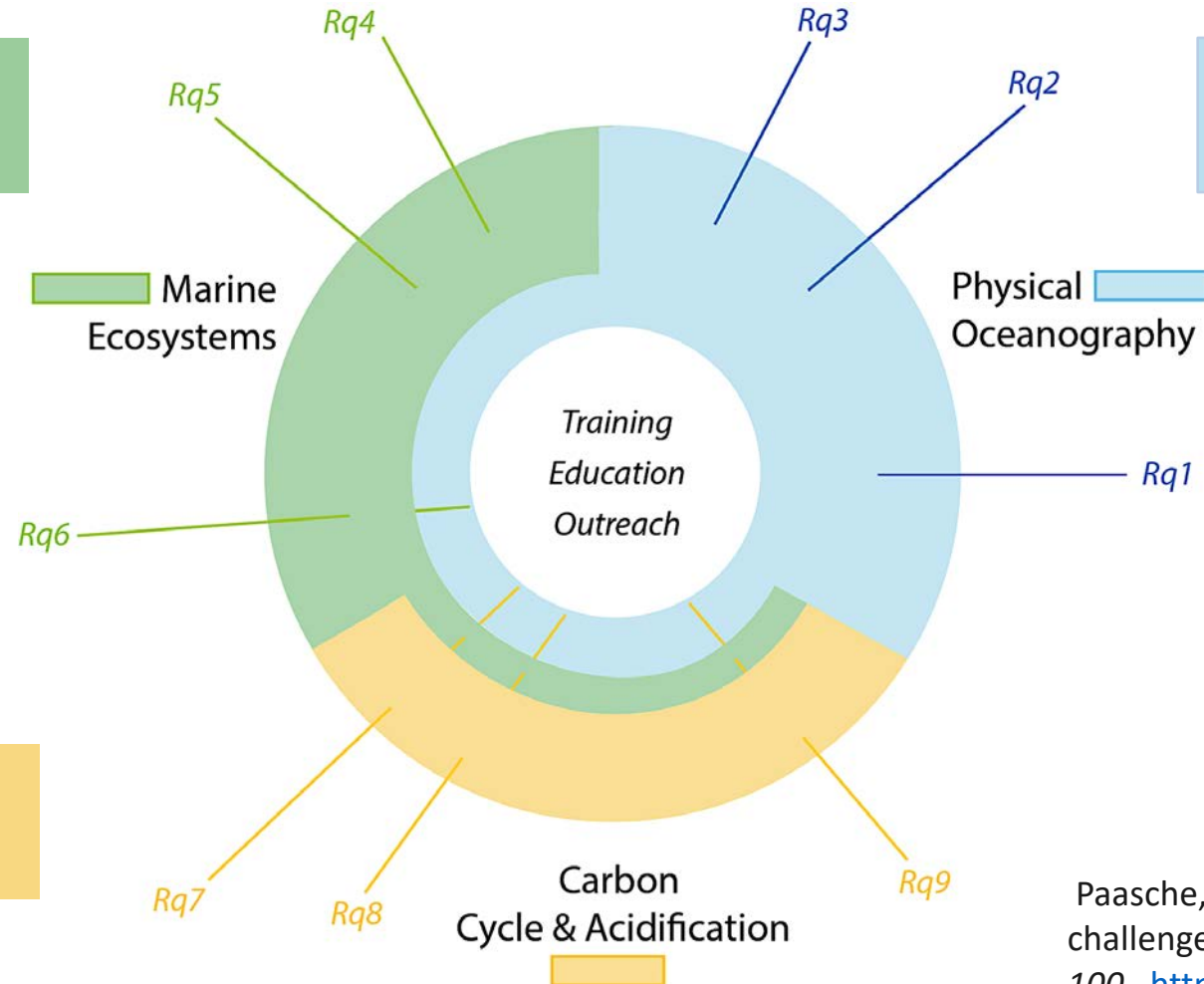
<https://synopticarcticsurvey.w.uib.no>

“What are the present state and major ongoing transformations of the Arctic marine system?”

How does primary production and associated availability of nutrients vary between Arctic regions?

What are the changes in water mass sources, sinks and transformations?

What is the contribution of the Arctic Ocean to maintaining the global ocean carbon dioxide reservoir and uptake?



Paasche, Ø., et al. (2019), Addressing Arctic challenges requires a synoptic ocean survey, *Eos*, 100, <https://doi.org/10.1029/2019EO136200>.

Pre-Pandemic planned SAS cruises

Canada, USA
JOIS/AON-BGOS (Williams/Proshutinsky, Louis)
LIA-MPA (Michel, Louis)
Davis Strait (Lee/Azetsu-Scott, Armstrong)

Japan, Mirai

Korea, ARAON

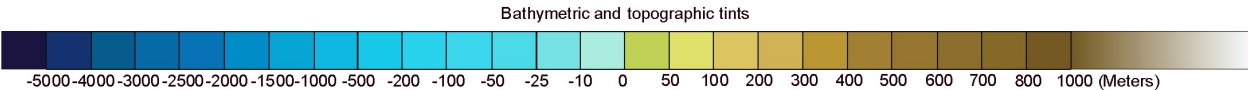
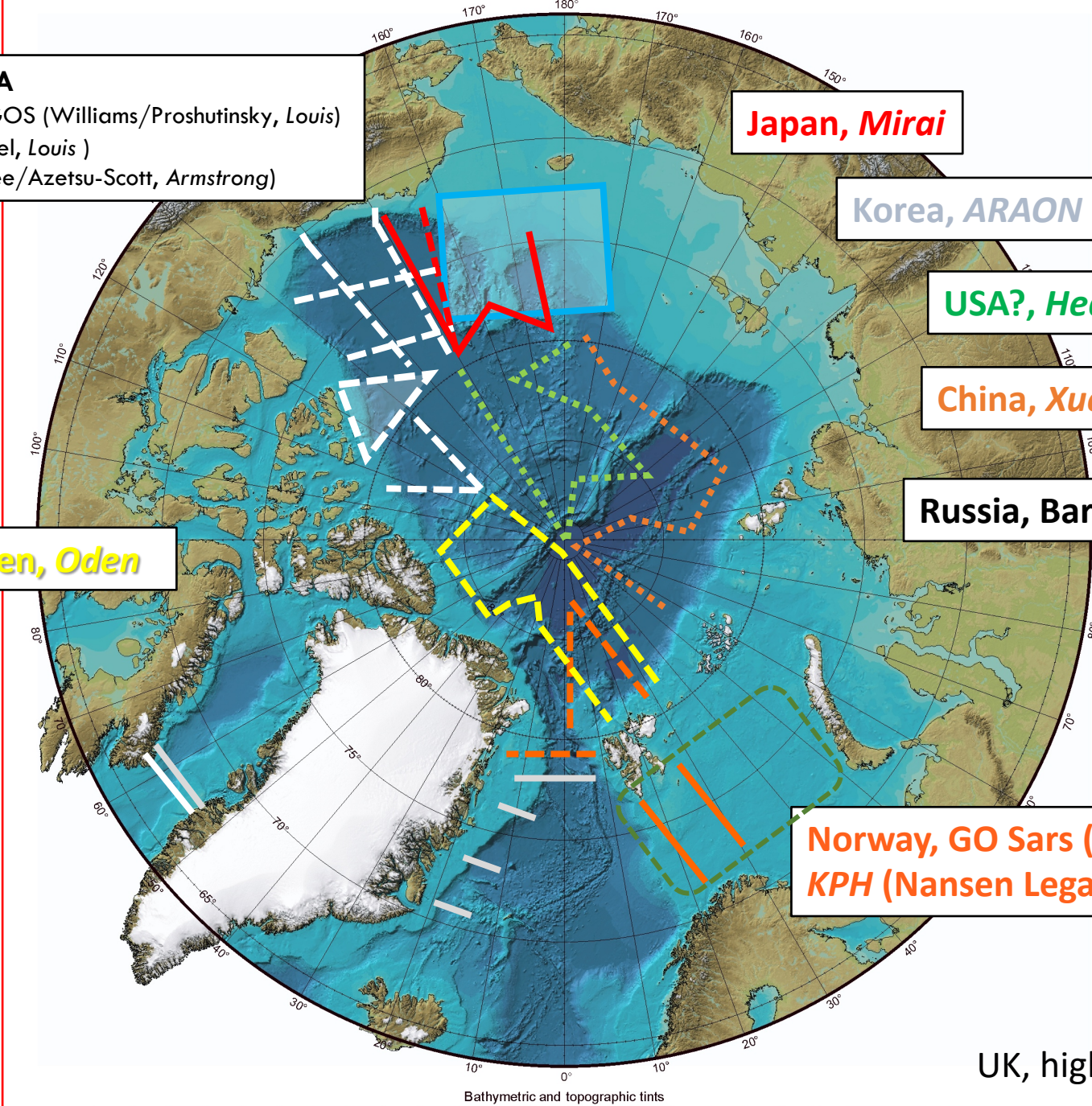
USA?, Healy

China, Xuelong?

Russia, Barents,?

Sweden, Oden

**Norway, GO Sars (IMR)
KPH (Nansen Legacy) 2021**



UK, highlight topic

Mapping the Arctic: Filling Gaps in the Arctic Geospatial Foundation to Support Research and Sustainability



Ashley Chappell

Integrated Ocean and Coastal Mapping Coordinator
National Oceanic and Atmospheric Administration (NOAA)

Follow-up? Any questions? ashley.chappell@noaa.gov

Foundational Arctic Mapping to Fill Gaps

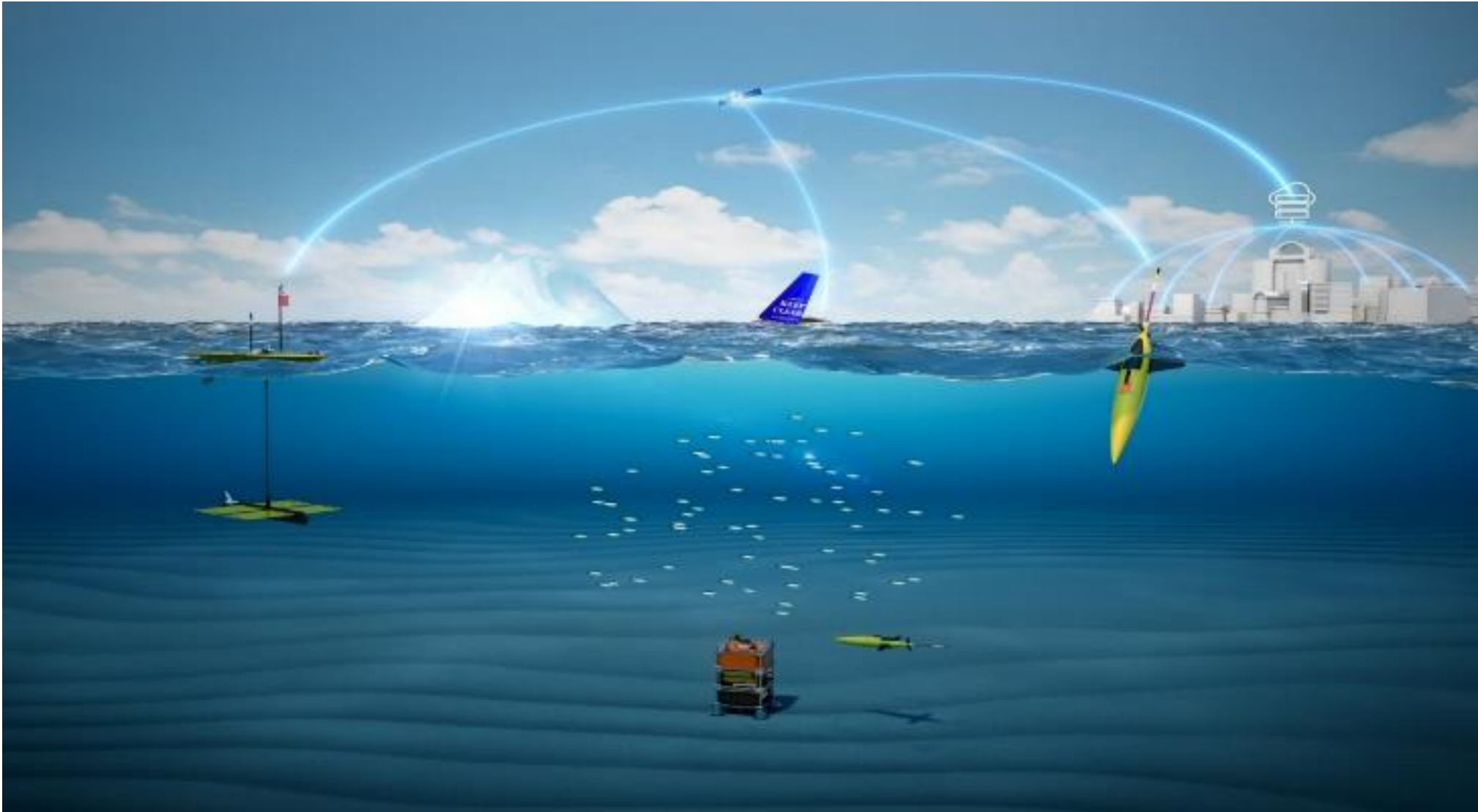
- Arctic = unsurveyed to poorly mapped
- Geospatial mapping essential for:
 - Safe navigation
 - Emergency response
 - Climate adaptation strategies
 - Coastal community resilience
 - Arctic science, to understand and sustainably manage Arctic ecosystems/Living Marine Resources
- Seabed 2030, UN Decade, IHO, Arctic State goals for mapping
 - Canada, Denmark/Greenland, Norway, Italy, USA... More welcome!
 - STEM diversity, Technology R&D
- How to participate:
 - Inventory/share existing mapping data (shoreline, bathymetry, backscatter, etc.)
 - Identify gaps
 - Campaigns to map! HO's, TEK, Partners, Crowd-source, Transits, Uncrewed platforms

GLIDER

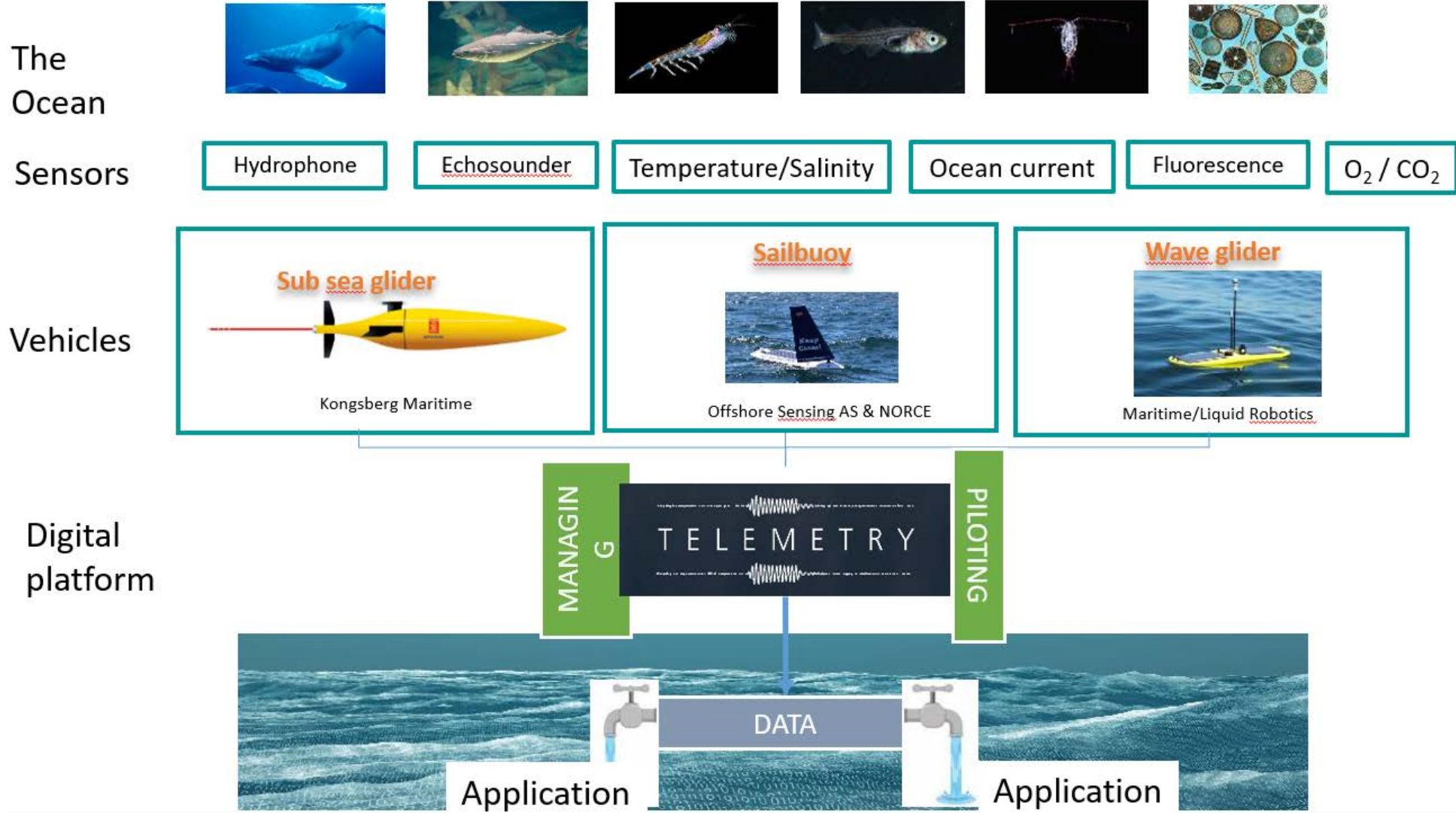
Unmanned ocean vehicles, a flexible and cost-efficient offshore monitoring and data management approach

Marine gliders

Piloted from your PC, data transferred in real time to your PC



Digital mapping of the ecosystem



Atlas of Community-Based Monitoring & Indigenous Knowledge in a Changing Arctic

arcticcbm.org



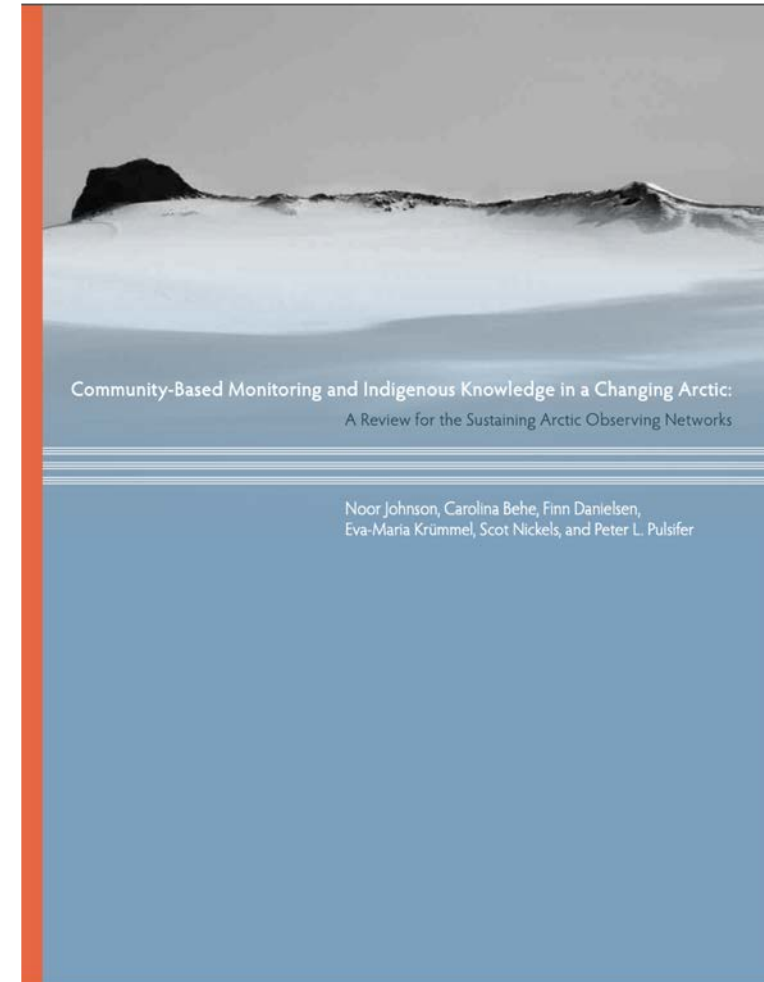
Noor Johnson

Exchange for Local Observations and Knowledge of the Arctic
National Snow and Ice Data Center,
University of Colorado Boulder
in cooperation with
Inuit Circumpolar Council



Background

- 2011: Sustaining Arctic Observing Networks (SAON) Task #9 on Community-Based Monitoring and Indigenous Knowledge (IK) proposed by Inuit Circumpolar Council (ICC) and collaborators
- 2012 – 2014: Survey of programs; development of *arcticcbm.org*
- 2015 - 2016: Journal article (*Johnson et al. 2015 - Arctic*) and report (eloka-arctic.org/reports)



Atlas of Community-Based Monitoring & Indigenous Knowledge in a Changing Arctic

Focus

About

Welcome

Login

Circumpolar Arctic

Help



Welcome to the Atlas of Community-Based Monitoring in a Changing Arctic. Arctic communities are actively involved with observing social and environmental change; this atlas was designed to showcase the many community-based monitoring (CBM) and Indigenous Knowledge (IK) initiatives across the circumpolar region.

If you are involved with a CBM initiative, we hope you will consider [joining the atlas](#).

This site also features a map of [Inuit Mental Health and Wellness initiatives](#).

The atlas was brought to you by these partner institutions:



Geomatics and Cartographic Research Centre



Atlas of Community-Based Monitoring & Indigenous Knowledge in a Changing Arctic

Focus

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Help



Project: (Sea Ice Monitoring Network)

More Info

Find on Map

Geometries

Project: (Kangiqtugaapik (Clyde River) Weather Station Network (Silalirijit Project))

More Info

Find on Map

Geometries

Project: (Igliniit (Trails) Project)

More Info

Find on Map

Geometries



Scroll through this record to see more information including links to other Community Projects, related media, and associated files.

Project title: Kangiqtugaapik (Clyde River) Weather Station Network (Silalirijit Project)

Organization name: Ittaq Heritage and Research Centre in collaboration with the University of Colorado and Colorado State University

Project contact: Dr. Shari Fox

Address: P.O. Box 241, Clyde River, Nunavut Canada X0A 0E0

Phone number: +1(867) 223 2006

E-mail: shari.fox@nsidc.org

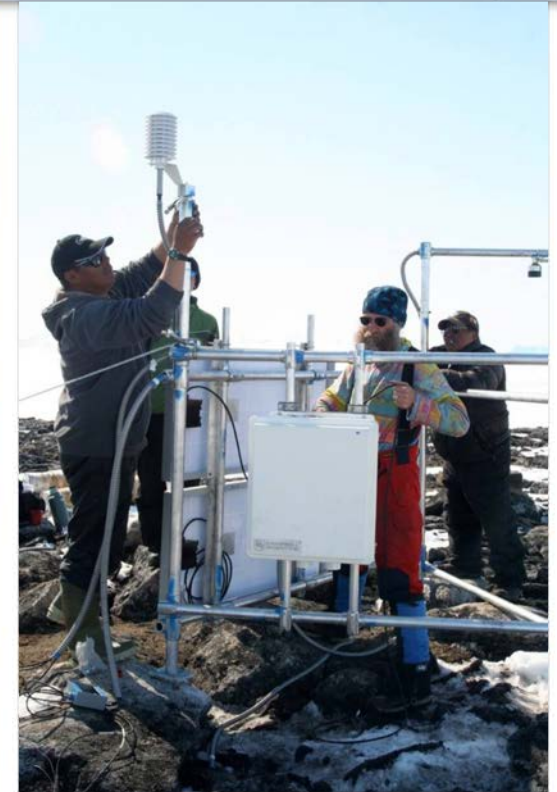
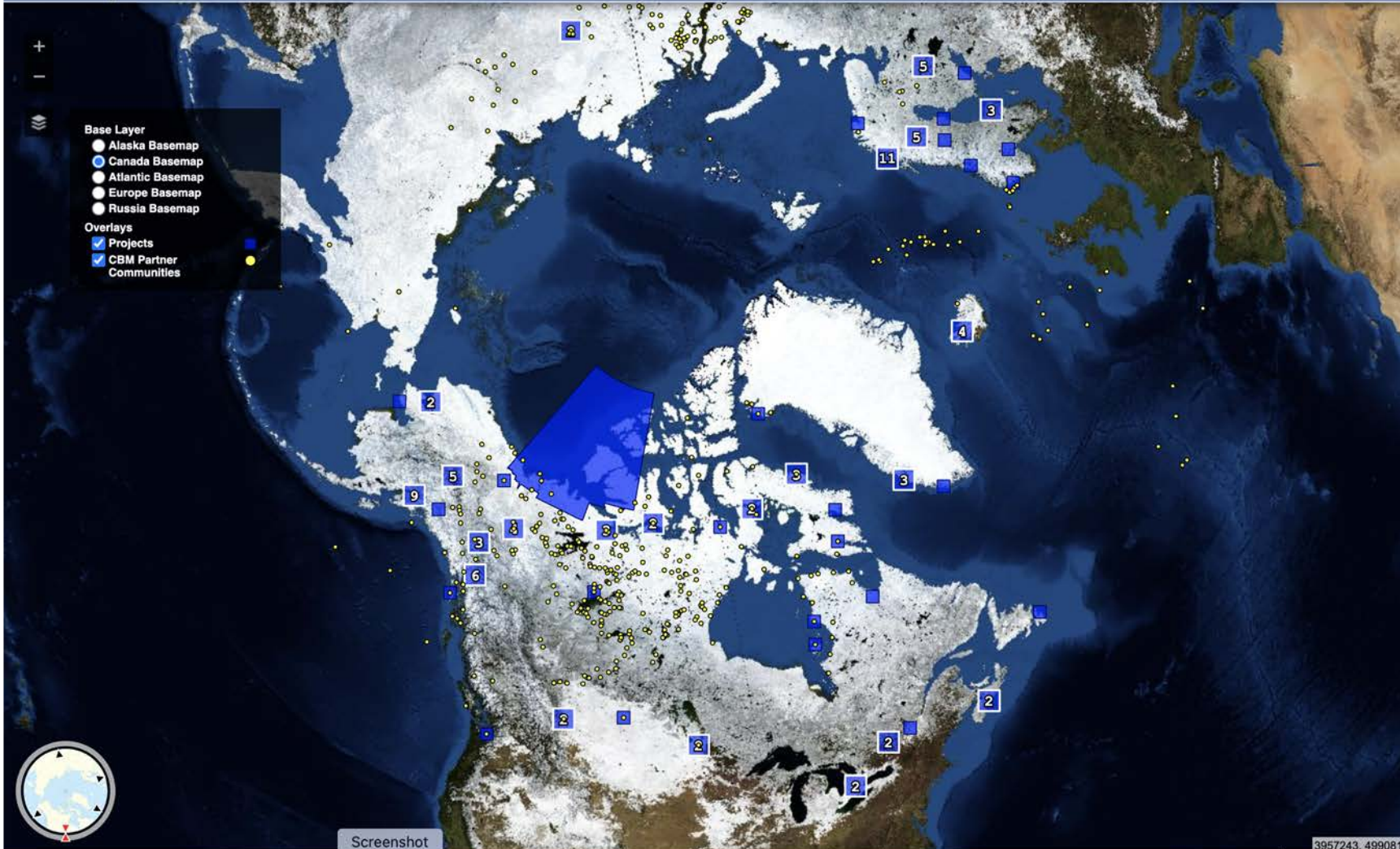
Funded by: Funded by the U.S. National Science Foundation (OPP 0753854). The NSF title for the project is IPY: Collaborative Research: Linking Inuit Knowledge and Local-Scale Environmental Modeling to Evaluate the Impacts of Changing Weather on Human Activities at Clyde River, Nunavut. The Principal Investigator of the project is Dr. Shari Fox, University of Colorado Boulder.

Start Date: 2009

Progress: In Progress

Project website: <http://eloka-arctic.org/communities/clyderiver/index.html>

Data available at <http://www.clyderiverweather.org/>



(silalirjiit_IMG_8074.jpeg)

Title Photo credit: Shari Gearheard

Description Silalirjiit project team members Esa Qillaq (left), Glen Liston (centre), and Jayko Ashevak, install the automated weather station at Akullaqattak, part of the Kangiqtuqaapik Weather Station Network.

Reference : Project: (Kangiqtuqaapik (Clyde River)

Next steps & contact

Next steps (*pending additional resources*):

- Update atlas with new programs (since 2015)
- Enhance information about data collection, geographic scale, and data availability and use
- Goal: support network-building to coordinate observations, connect programs with regional/pan-Arctic observing initiatives

To learn more:

arcticcbm.org

eloka-arctic.org/reports

Questions? Suggestions of programs to add? Please contact: noor.johnson@colorado.edu

Arctic Biodiversity Data Service (ABDS) and the Circumpolar Biodiversity Monitoring Programme (CBMP)



Catherine Coon

CBMP Co-Chair

Circumpolar Biodiversity Monitoring Program

Monitoring Arctic Life to Improve Decision Making

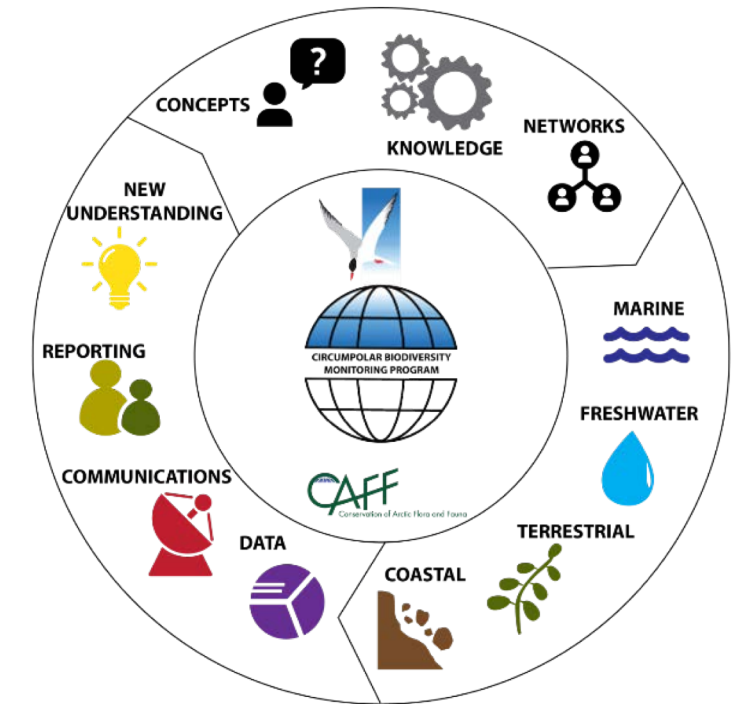
The CBMP improves decision making by providing:

» **Environmental baselines** to facilitate a greater understanding of Arctic ecosystems and how they may respond to change.

» **The Arctic Biodiversity Data Service (ABDS data portal)**, an accessible, efficient, and interoperable infrastructure to house, manage, and display status and trends information.

» **Authoritative assessments** of the Arctic's biodiversity, targeting regional, national, and international reporting requirements.

» **Harmonized biodiversity monitoring efforts** across the Arctic to improve program efficiencies, leverage program results and increase the power of analyses.



<https://www.caff.is/monitoring>

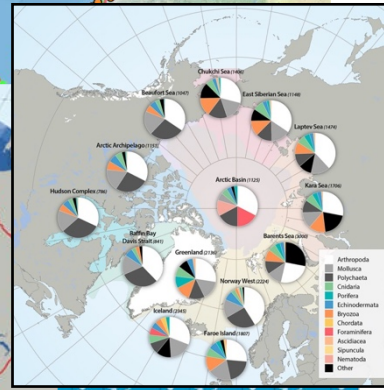
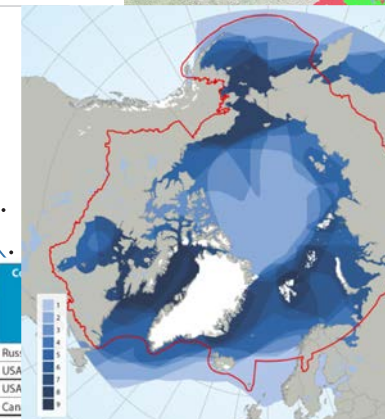
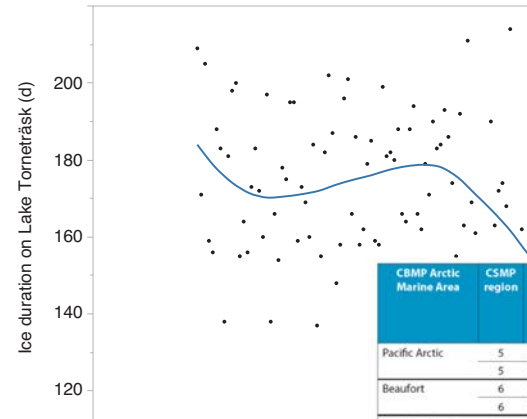
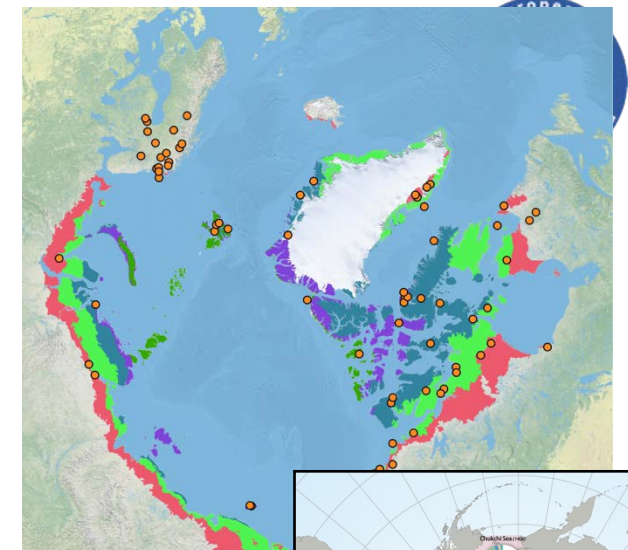
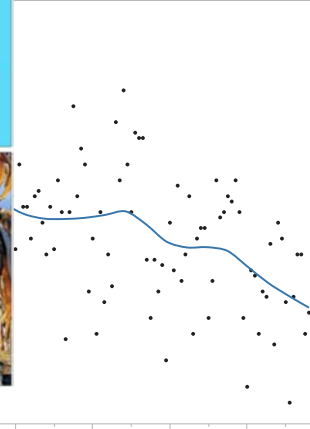
Data - ABDS



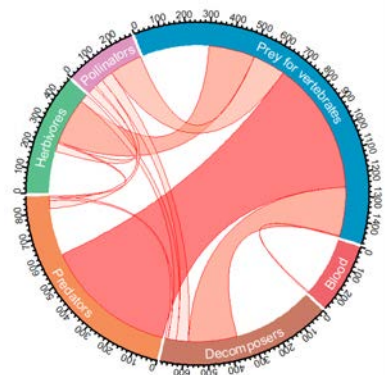
- Species
- Stressors
- Indices
- Networks
- Data
- Maps
- Graphics

- Knowledge of many species, ecosystems and their stressors is fragmentary
- Develop tools for data sharing so data collected can be more easily accessible
- Improve access to information

www.abds.is



CBMP Arctic Marine Area	CSMP region	Total		Pop		T		U		R	
		D	S	D	S	D	S	D	S	D	S
Pacific Arctic	5 Rus										
	5 USA										
Beaufort	6 USA										
	6 Can										
Arctic Archipelago	7 Can										
	7 Greenland	200	D	500	U						
	8 Canada	600	D	U	U	116,000	I	540,000	S		
Davis-Baffin	8 Greenland			25,000	S	42,628	I	212,160	S		
	10 Canada				U	7,000	U	50,000	S		
	10 Greenland			15,000	S	60,720	I	13,325	D	390	D
	11 Canada			1,800	D	2,000	S	4,500	S	33,600	D
Hudson Complex	9 Canada				U	U		950,000	S		>200,000
	12 Greenland	1,500	D	20,000	S	3,700	U	4,225	D	13,000	U
Atlantic Arctic	13 Iceland			800	D	407,200	D	205,000	D	405,600	D
	14 Iceland			1,600	D	173,700	D	121,800	D	292,500	D
	15 Faroe Islands					200,000	D			180,000	D
	18 Norway					81,000	D	100	D	17,000	S
	19 Norway	2,000	S	4,200	U	255,000	D	725,000	D	133,000	I
	19 Russia	<3,000	U	>5,000	I	<500,000	D	<700,000	U	>10,000	U
Kara Laptev	20-21 Russia	<10,000	U	U	U	<50,000	U	<20,000	U	>10,000	U



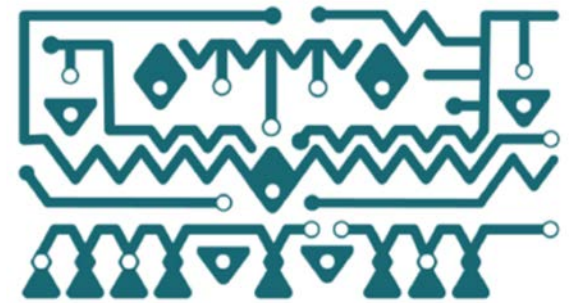
Recommended Actions to Increase International Observations and Data Sharing

Sandy Starkweather

ASM3 Science Advisory Board Member

Needed actions – Theme 1: Observe

- **Increasing partnerships and linkages** between Indigenous-led and scientifically-driven efforts, Co-Production of Knowledge;
- **Strategically filling routine observing and knowledge gaps** (synthesis), ideally **in an internationally coordinated way**;
- **Improving data stewardship** using FAIR and CARE principles;
- **Leveraging existing infrastructure**;
- **Developing new technologies**; and
- **Funding for data management and training.**



FAIR: Findable, Accessible, Interoperable, Reusable

CARE: Collective Benefit, Authority to Control, Responsibility, & Ethics

Generating actions – Theme 1: Observe

- **Scaling out actions**

- What are they? **Parallel efforts that fill critical gaps (geographic, system-specific, etc.)**
- Some examples: Mapping the seafloor (*e.g. US & HIGH NORTH*), system studies (*e.g. DBO, GEM, COAT, FRAM, T-MOSAIC*); new technology deployments (*e.g. GLIDER, AWIPEV LIDAR*); campaigns (*e.g. Tu-134 "Optik" flying laboratory*); Indigenous observer projects (*e.g. CROW*)
- How is action developed? **Directly via national priorities/funding, soft coordination**

- **Scaling up actions**

- What are they? **Unifying efforts that merge capacity to expand possibilities.**
- Some examples: Indigenous-led (*e.g. ICC-AK Food Security*) and Multi-national (*e.g. SAON-ROADS*) Planning Frameworks; Infrastructure sharing & coordinated campaign protocols (*e.g. MOSIAC, ARICE, SIOS, INTERACT, SAS*); Interoperability efforts (*e.g. Arctic Data Committee, Merged MOSAIC data files*); new tech development
- How is action developed? **Multi-national funding, strong national Arctic bodies, clear national mandates to cooperate e.g. Arctic Council WG's, IASC, SAON, WMO, IOC, SEABED2030, Arctic Funders Forum.**

Questions & Answers



Third Arctic Science Ministerial Webinar Series

Theme 1: Observe

*Observing networks; Data sharing
- towards implementation*

**Please type any questions related to the
webinar series in the Q&A box.**

Any remaining questions may be sent to
ml-asm3@mext.go.jp

Third Arctic Science Ministerial Webinar Series

Theme 2: Understand

Enhance understanding and prediction capability on Arctic environmental and social systems and its global impact

17 February 2021

13: 00 - 14: 00 UTC



Program here! ► <https://asm3.org>

ASM3

3rd Arctic Science Ministerial
Co-hosted by Iceland and Japan
NEW DATE: 08-09 May 2021
Tokyo, Japan



Webinar Series

This webinar series is designed to increase transparency of the Arctic Science Ministerial science process and to provide additional



Concept Note

Since the last Arctic Science Ministerial in 2018, changes in the Arctic ecosystem and the resulting impacts locally and globally have



Briefing Meetings

Briefing meetings for embassies will take place throughout the planning process for ASM3. This page will be updated with relevant

Thank You

ASM3 Email: ml-asm3@mext.go.jp



Government of Iceland
Ministry of Education,
Science and Culture



MEXT

MINISTRY OF EDUCATION,
CULTURE, SPORTS,
SCIENCE AND TECHNOLOGY-JAPAN