Arctic Observing Summit 2026

Arctic Science Summit Week
Aarhus, Denmark
March 30 - April 1

Summit Agenda

The Arctic Observing Summit (AOS) is a high-level, biennial international forum. Its primary goal is to provide community-driven guidance for the design, implementation, and sustained, long-term operation of the international network of Arctic observing systems.

The summit brings together a diverse community, including researchers, Indigenous Peoples, government agencies, and others, to foster international communication and coordination. This collaboration aims to optimize resource allocation, minimize duplication and gaps, and address the urgent needs of Arctic observing, including the human component. The recommendations generated at the AOS inform the work of the Sustaining Arctic Observing Networks (SAON) and global initiatives, ultimately improving our understanding and response to rapid, system-scale Arctic change.

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Summit schedule

Monday, March 30

Start	End	Room	Session
8:00	9:30	Aula	Opening plenary; Panel on Indigenous Leadership for Arctic Observing & Research
9:30	10:00		Coffee break
10:00	12:00	Lavvu (Indigenous Pavilion)	Enhancing Research Quality and Societal Relevance Through Indigenous Knowledge, Co-Production, and Equitable Community Engagement
10:00	12:00	Richard Mortensen Stuen	SAV Permafrost: discussion of status and future development
10:00	12:00	Mogens Zieler Stuen	Career Development
12:00	13:30		Lunch
13:30	15:30	Preben Hornung Stuen	Enhancing Research Quality and Societal Relevance Through Indigenous Knowledge, Co-Production, and Equitable Community Engagement
13:30	15:30	Richard Mortensen Stuen	Building and Sharing Inventories of Observational Capacities for Discovery and Integration across a Spectrum of Arctic Observing Systems
13:30	15:30	Mogens Zieler Stuen	Improving Arctic Observations: Wildfire Shared Arctic Variable & Terrain Trafficability
15:30	16:00		Coffee break
16:00	18:00	Preben Hornung Stuen	Enhancing Research Quality and Societal Relevance Through Indigenous Knowledge, Co-Production, and Equitable Community Engagement

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16:00	18:00	Richard Mortensen Stuen	Arctic ROADS as a Path for Inclusive, IPY-Scale Collaboration: Panel on ROADS and IPY5
16:00	18:00	Mogens Zieler Stuen	SAV Permafrost: discussion of status and future development

Tuesday, March 31

Start	End	Room	Session
8:00	9:30	Preben Hornung Stuen	Data systems
8:00	9:30	Richard Mortensen Stuen	Arctic ROADS as a Path for Inclusive, IPY-Scale Collaboration: Community Hubs, Benefit Frameworks, and Co-Produced Observing
8:00	9:30	Mogens Zieler Stuen	Technology: AI and ML
9:30	10:00		Coffee Break
10:00	12:00	Richard Mortensen Stuen	Expert Panels in Practice - what is needed to put the ROADS process in practice
10:00	12:00	Lavvu (Indigenous Pavilion)	Birgehallat: The Saami Way of Understanding and Adapting to a Changing World
10:00	12:00	Mogens Zieler Stuen	Technology: Drones and remote sensing
12:00	13:30		Lunch
13:30	15:30	Richard Mortensen Stuen	Strengthening Arctic Observing Through Indigenous-Led and Community-Based Monitoring Initiatives
13:30	15:30	Mogens Zieler Stuen	Technology: Drones and remote sensing
15:30	16:00		Coffee Break
16:00	18:00	Poster hall	Poster session
16:00	18:00	Lavvu (Indigenous Pavilion)	Indigenous-led Observing Working Group Session

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Wednesday, April 1

Start	End	Room	Session
9:00	10:30	Preben Hornung Stuen	Arctic ROADS as a Path for Inclusive, IPY-Scale Collaboration: Fostering Present and Future Expert Panels
9:00	10:30	Richard Mortensen Stuen	Centering Indigenous Observations in Arctic Marine Wildlife Management and Conservation
10:30	11:00		Coffee Break
11:00	12:30	Richard Mortensen Stuen	Data Systems: Data as protection
11:00	12:30	Preben Hornung Stuen	Shifting Perspectives: Reconsidering measures of success for Arctic observing
11:00	12:30	Mogens Zieler Stuen	Investing in Salmon Observing for Arctic Resilience: Bridging Research, Funding, and Community Needs
11:00	12:30	Conference room 1	Indigenous-led Observing Working Group Writing Session
12:30	14:00		Lunch
14:00	16:00	Aula	Closing plenary ASSW Closing Ceremony

Plenary

Introduction

The summit kicks off with an introduction to the Arctic Observing Summit, an overview of the agenda and what to expect from the sessions. We will introduce the ROADS Process, community norms, and key outcomes from previous Arctic Observing Summits.

Panel discussion: Indigenous Leadership for Arctic Observing & Research

Indigenous groups across the Arctic have developed observing programs to address local challenges. This panel discussion, moderated by Victoria Qutuuq Bushman (Inuit Circumpolar Council, Greenland), features three speakers representing different observing programs from across the Arctic. Conversations will focus on how observing approaches meet community needs.

Speakers will give a brief (5-8 minutes) statement to introduce their programs, followed by questions from the moderator and discussion.

Day	Time	Room	Topic
Monday	8:30 - 9:30	Aula	Welcome, introduction Indigenous led-observing

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Session descriptions

Permafrost Shared Arctic Variables: discussion on current status and future developments

Chairs:

Zoé Brasseur, Svalbard Integrated Observing System zoe.brasseur@sios-svalbard.org
Hanne Christiansen, Aarhus University hannehc@envs.au.dk
Alexandra Meyer, University of Vienna alexandra.meyer@univie.ac.at

Description:

Climate change is accelerating permafrost thaw across the Arctic, driving rapid landscape changes including geohazards, affecting infrastructure and increasing risks associated with ground instability and coastal erosion. Moreover, these changes have impacts on the health and well-being of communities and individuals. Addressing these challenges requires spatially detailed information and more coordinated observing systems. Yet, the Arctic lacks a unified set of permafrost observables to support decision-making at local, regional, and pan-Arctic scales.
In this session, we will introduce the current work and suggested further approach developed by the expert panel on Permafrost Shared Arctic Variables. This was established as part of the Arctic PASSION EU project, and is a part of the SAON roadmap. We look forward to discussing ideas, ambitions, and ways to obtain a good process forward for developing the Permafrost SAV.

Goals:

1. Present the current status of the Permafrost Shared Arctic Variables.
2. Engage the audience in identifying gaps and priorities on developing Permafrost SAV across the Arctic.

Times and meeting rooms:

Day	Time	Room	Topic
Monday	10:00 - 12:00	Richard Mortensen Stuen	Permafrost SAVs
Monday	16:00 - 18:00	Mogens Zieler Stuen	Permafrost SAVs

Building and Sharing Inventories of Observational Capacities for Discovery and Integration across a Spectrum of Arctic Observing Systems

Chairs:

William Manley (University of Colorado Boulder, william.manley@colorado.edu)
Alice Bradley (Williams College, alice.c.bradley@williams.edu)
Hazel Shapiro (IARPC Secretariat and US AON, hazel@iarpccollaborations.org)
Shannon McAllister (Arctic Institute of North America, University of Calgary, shannon.mcallister@ucalgary.ca)

Description:

Numerous organizations have called for a more integrated “Arctic Observing System”. However, the fragmented and distributed nature of countless observing efforts makes it difficult to identify gaps, build connections, optimize resources, or clarify future directions. This session will explore strategies for discovery and integration through coordinated efforts to create and share inventories of observational capacities. What are the benefits of tracking or cataloging observing infrastructure and activities (such as research and monitoring sites, stations, facilities, platforms, projects, cruises, networks, etc.)? How can we make structured information (i.e., metadata) about observing assets more Findable, Accessible, Interoperable, and Reusable? How can we assist or incentivize organizations to build and share such inventories? Discussion will focus on use cases, best practices, and actionable steps. Some initiatives are underway – through SAON and US AON, for example – but more can be done to link and foster progress on a path to better meet observing goals.

Goals:

1. Collectively assess the rationale for building and sharing inventories of observational capacities.
2. Review lessons learned and best practices for the creation and interoperability of observing-related catalogs.
3. Identify practical steps forward to help organizations build, share, and utilize inventories effectively.

Relevant white papers and short statements:

Manley, W., Bradley, A., Shapiro, H., Larsen, J. R., McAllister, S., & Allen, D. (2026, February 27). Building and Sharing Inventories of Observational Capacities for Discovery and Integration across a Spectrum of Arctic Observing Systems. Arctic Observing Summit (2026), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18806845

Bradley, A., Larsen, J. R., Manley, W., Lihavainen, H., Eicken, H., & Divine, L. (2026, February 27). Observational capacity inventories: potential uses and specifications. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18807101

Relevant posters:

1	From Satellite to Safety: Connecting Arctic Observations to Community Resilience	Hazel Shapiro
3	Enabling Discovery: A New Registry of Polar Observing Networks (RoPON)	William Manley
4	Developing an IPY Arctic Access Programme in support of implementation of IPY and international research priorities	Elmer Topp-Jørgensen

Times and meeting rooms:

Day	Time	Room	Topic
Monday	13:30 - 15:30	Richard Mortensen Stuen	Observing Inventories

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Enhancing Research Quality and Societal Relevance Through Indigenous Knowledge, Co-Production, and Equitable Community Engagement

Chairs:

Claudine Hauri, University of Alaska Fairbanks, chauri@alaska.edu

Emily Lescak (IARC, RNACoobs, elescak@alaska.edu)
Daniela Walch (Université du Québec à Rimouski, IASC MWG Fellow 2024, DanielaMarianneRegina.Walch@uqar.ca)
Jihoon Jeong (KOPRI, IASC Social and Human WG, jj@kopri.re.kr)
Cana Itchuaqiyaq (Virginia Tech, ICARP IV Indigenous Peoples' Coordination Group, cana@vt.edu)
Cansu Culha (University of Columbia, permafrost, cansu.culha@gmail.com)
Julia Andreasen (IARC, jrandreasen@alaska.edu)
Anna Heiða Olafsdottir (GRO, IASC MWG chair, anna.olafsdottir@hafogvatn.is)
Laura Ghigliotti (IAS, IASC MWG co-chair, laura.ghigliotti@cnr.it)
Jakob Assmann (UZH, IASC TWG, jakob.assmann@uzh.ch)
Myrah Graham (Northern Research Liaison, Amundsen Science, myrah.graham@as.ulaval.ca)
Noor Johnson (NSIDC, noor.johnson@colorado.edu)
Roberta Glenn (IARC, AAOKH, rjglenn@alaska.edu)
Donna Hauser (IARC, AAOKH, dhauser2@alaska.edu)
Rowenna Gryba (Inuit Circumpolar Council, rgryba@inuitcircumpolar.com)

Description:

This session welcomes participants from all disciplines, including those new to co-production, to explore how Indigenous Knowledge and equitable community engagement can strengthen research quality and increase societal outcomes. We invite the wider Arctic research community to submit two-page case studies that highlight successes of using multiple knowledge systems, co-production of knowledge and equitable engagement of communities, as well as challenges, and lessons transferable across fields. These will be shared online and read in advance. The session will begin with brief summaries, followed by guided discussion, targeted at the development of a manuscript that reflects on how the co-produced research presented in these case studies enhances both the quality and the societal relevance of Arctic research.

Goals:

1. Share and reflect on case studies – Highlight examples of co-production with Indigenous Knowledge and community engagement in Arctic research, including successes, challenges, and lessons that can inform the design of and approach to future research.

2. Foster cross-disciplinary learning – Provide space for participants, including those new to co-production, to explore how these approaches can strengthen the scientific quality of research and its societal relevance. Create linkages among IASC working groups. Share and reflect on case studies – Highlight examples of co-production with Indigenous Knowledge and community engagement in Arctic research, including successes, challenges, and lessons that can inform the design of and approach to future research.
3. Co-develop a publication – Collaboratively synthesize the case studies and session discussions into a manuscript showcasing how co-production enhances research quality and societal outcomes across disciplines.

Times and meeting rooms:

Day	Time	Room	Topic
Monday	10:00 - 12:00	Lavvu (Indigenous Pavilion)	Research Quality and Societal Relevance
Monday	13:30 - 15:30	Preben Hornung Stuen	Research Quality and Societal Relevance
Monday	16:00 - 18:00	Preben Hornung Stuen	Research Quality and Societal Relevance

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Career Development

Chairs:

Christina Goethel, University of Maryland Center for Environmental Science, cgoethel@umces.edu
Axel Schlindwein, Association of Polar Early Career Scientists, axel.schlindwein@uit.no

Description:

A central priority of many observing networks and systems is to foster meaningful Early Career Researcher/Participants, not only as contributors, but as leaders of new

scientific initiatives. Formation of different working groups within some of these frameworks is working to realize these visions, but also tend to be program specific.

The main goal of this session is to bring together ECRs from across different networks and systems and learn how we can best support each other in career development. Oftentimes, due to funding limitations, cycles, and variations, maintenance in these long-term observatories can be challenging, leading to a loss of training and institutional knowledge from the next generation. As an example, the Synoptic Arctic Survey effort has recently formed an ECR working group and can serve as a case study of the challenges, efforts, and solutions to maintain this important training and institutional knowledge of varying programs. Their goal is to build from the success of the initial SAS effort to retain applied expertise, strengthen international networks, collaborate towards common scientific aims, and ensure the goals of SAS2 are realized. The overall mission of SAS ECR is to retain an international knowledge base and leverage efforts towards a comprehensive pan-Arctic survey spanning marine, atmospheric, and cryospheric components to effectively record and understand changes in the Arctic system. This goal is central across the Arctic observing systems, so how do we get there?

Goals:

1. Define a centralized list of the biggest hurdles in career development across the Arctic
2. Define early career
3. Identify solutions for maintenance of early careers through career development strategies across different observing frameworks

Relevant white papers and short statements:

Dryak-Vallies, M., Strand, S. M., Payne, M., & Schlindwein, A. (2026, March 2). Early Career Voices in Arctic Observing: Outcomes from the Polar Early Career World Summit. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18839000

Relevant posters:

13	Collaborative Art–Science Practices and Pedagogies on the Juneau Icefield	Hannah P. Mode

14	Connecting undergraduate education to Arctic observing: Integrating data analysis with interdisciplinary learning from the classroom to Greenland	Michelle Koutnik
15	Integrating Art and Citizen Science into Arctic Observation: Lessons Learned from a Developing a Field Course at Toolik Field Station	John Smelter

Times and meeting rooms:

Day	Time	Room	Topic
Monday	10:00 - 12:00	Mogens Zieler Stuen	Career Development

Birgehallat: The Saami Way of Understanding and Adapting to a Changing World

Chairs:

Evie Morin, Research Institute for Sustainability, evie.morin@rifs-potsdam.de
Jan-Erik Henriksen, The Arctic University of Norway, jan.e.henriksen@uit.no
Gunn-Britt Retter, Saami Council, gbr@saamicouncil.net

Description:

Birgehallat is the Northern Saami word for reading and understanding nature—a way of knowing that reflects generations of close relationships between the Saami and their homelands, built through continuous observation and adaptation to environmental changes. Today, this knowledge and practice continues to offer vital insights for Arctic observation and biodiversity conservation. This session explores how recent multilateral Arctic biodiversity agreements consider Indigenous knowledge. Then, we explore Sea Saami ways of observing and responding to environmental change through cases, including a screening of *Tørrfisk* by Harry Johansen, followed by a conversation with the

film director. We conclude with recommendations for strengthening equitable partnerships and ensuring Saami leadership in Arctic decision-making and observation.

Goals:

1. Assess how Indigenous Knowledge is reflected in recent Arctic biodiversity agreements.
2. Share Sea Saami approaches to observing and adapting to environmental change
3. Identify pathways for stronger Saami participation and leadership in decision-making.

Times and meeting rooms:

Day	Time	Room	Topic
Tuesday	10:00-12:00	Lavvu (Indigenous Pavilion)	Saami knowledge and nature

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Improving Arctic Observations: Wildfire Shared Arctic Variable & Terrain Trafficability

Chairs:

Katriina Veijola, Finnish Meteorological Institute, Katriina.Veijola@fmi.fi
Anni Kröger, Finnish Meteorological Institute, anni.kroger@fmi.fi
Mikko Strahlendorff, Finnish Meteorological Institute, Mikko.Strahlendorff@fmi.fi

Description:

Wildfire preparedness requires improved understanding of wildfire risk and terrain trafficability in rapidly changing Arctic environments. Focusing on these key themes, this session presents advances from *IBA Arctic Wildfire*, *ArcticPASSION* and *CryoSCOPE* projects. We highlight efforts to implement the Wildfire Shared Arctic Variable and demonstrate our mobile tool for in-situ observations. By combining user observations with meteorological and satellite data through machine learning, we forecast soil wetness and trafficability, supporting smart routing in wet and wildfire preparedness in

dry conditions - strengthening local decision-making and climate adaptation. If you live, travel, or care for the Arctic, join the discussion!

Goals:

- Discuss and demonstrate technical solutions, e.g. using machine learning to improve and refine satellite observations by using local observations.
- Get feedback on the technical solutions and what kind of information the end-user service mobile tool could display and how, and ideas for the next steps.
- To build a network of relevant actors across the Nordic countries and North America supporting the implementation of an Ignition Identification (Wildfire) SAV and trafficability services.

Relevant statements and white papers:

Karcher, M., Sundfjord, A., Wilkinson, J., Murray, M., & Arctic PASSION project team. (2026, February 23). Visions and Policy recommendations for a future Arctic Observing System of Systems. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18749389

Orndahl, K., Barrio, I. C., Bjerke, J. W., García Criado, M., Epstein, H., Frost, G., Gerland, S., Goetz, S., Høgda, K. A., Parmentier, F.-J., Ravolainen, V., Myers-Smith, I., Tømmervik, H., & Winquist, E. (2026, February 23). Bridging knowledge gaps in tundra vegetation ecology in a warmer future Arctic. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18749541

Relevant posters:

1	From Satellite to Safety: Connecting Arctic Observations to Community Resilience	Hazel Shapiro
9	Strengthening the Arctic Observing System: What the AOS community can do next - with insights from the Arctic PASSION project	Lisa Grosfeld
14	Connecting undergraduate education to Arctic observing: Integrating data analysis with interdisciplinary learning from the classroom to Greenland	Michelle Koutnik
24	Perma-X Airborne Observations for Permafrost and Coastal Studies	Guido Grosse

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Times and meeting rooms:

Day	Time	Room	Topic
Monday	13:30-15:30	Mogens Zieler Stuen	Wildfire

Shifting Perspectives: Reconsidering measures of success for Arctic observing

Chairs:

Hazel Shapiro, Interagency Arctic Research Policy Committee (IARPC), hazel@iarpccollaborations.org
Tahnee Prior, Women of the Arctic, tahnee@genderisnotplanb.com
Sandy Starkweather, University of Colorado, CIRES, sandra.starkweather@colorado.edu
Vanessa Raymond, University of Alaska Fairbanks, vlraymond@alaska.edu

Description:

This session is designed to contribute to ongoing AOS and SAON efforts to strengthen the societal relevance and inclusivity of Arctic observing systems. It will provide a broadly engaging discussion space around how gender and Indigenous perspectives intersect with environmental data planning, while also seeking input on a focused Gender + Environment Data Alliance (GEDA)-supported research effort.

The session will invite participants to help refine and strengthen tractable pathways for making gender and Indigenous dimensions more visible and actionable within the International Arctic Observing Assessment Framework (IAOAF).

Relevant statements and whitepapers:

Hauri, C., Andreasen, J., Aracri, S., Assmann, J. J., Divine, L., Black, J., Culha, C., Ghigliotti, L., Graham, M., Gryba, R., Hauser, D., Huntington, H., Itchuaqiyaq, C. U., Johnson, N., Ksenofontov, S. S., Lafferty, A., Lescak, E., Morgenstern, A., Ogawa, M.,

Sugiyama, S., Walch, D. M. R. (2026, February 24). How Working Across Indigenous Knowledges and Academic Scientific Systems Strengthens Research Quality and Societal Relevance. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18751167

Rozanova-Smith, M., & Petrov, A. (2026, February 23). Reframing Social Research in the Arctic: Humanizing and Indigenizing Pathways to Improve Research Quality and Sociocultural Relevance. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18749664

Jull, M., Cho, L., Fong, J., Epstein, H., Ekimova, V., & UVAARC Team. (2026, February 24). Permafrost Management Through City Planning and Design: Linking Observations to Snow, Meltwater, and Infrastructure Practices in Utqiaġvik, Alaska. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18751276

Relevant posters:

1	From Satellite to Safety: Connecting Arctic Observations to Community Resilience	Hazel Shapiro
4	Developing an IPY Arctic Access Programme in support of implementation of IPY and international research priorities	Elmer Topp-Jørgensen
9	Strengthening the Arctic Observing System: What the AOS community can do next - with insights from the Arctic PASSION project	Lisa Grosfeld
10	Advancing shared visions for Arctic observing – the status of SAON Arctic ROADS implementation efforts and a call to action	Hajo Eicken

Times and meeting rooms:

Day	Time	Room	Topic
Wednesday	11:00-12:30	Preben Hornung Stuen	Planning tool for Arctic Observing

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Expert Panels in Practice - what is needed to put the ROADS process in practice

Chairs:

Chris Waigl, International Arctic Research Center, University of Alaska Fairbanks, cwaigl@alaska.edu
Margaret Rudolf, International Arctic Research Center, University of Alaska Fairbanks mhrudolf@alaska.edu

Description:

In this session we will provide a forum to have a structured conversation, sharing circle style, among anyone who is working in the SAON/ROADS process paradigm on elevating and empowering Indigenous voices in Arctic observing, and anyone engaged in similar work involving co-production of place-relevant applied science and knowledge generation among academic and agency practitioners and Indigenous experts. We envisage this session to constructively contribute to a framework-style shared understanding of prerequisites, requirements and constraints in this type of work.

Goals:

1. Knowledge exchange "what works" and "what is needed"
2. Work towards a toolkit-style document laying out how to design and run an Expert Panel

Times and meeting rooms:

Day	Time	Room	Topic
Tuesday	10:00-12:00	Richard Mortensen Stuen	Expert Panels

Strengthening Arctic Observing Through Indigenous-Led and Community-Based Monitoring Initiatives

Chairs:

Natasha Haycock-Chavez, University of Colorado Boulder, naha6486@colorado.edu
Noor Johnson, ELOKA/CU Boulder, noor.johnson@colorado.edu

Description:

Documenting and sharing Indigenous and local observations of a changing Arctic is critical for effective decision-making, transmission of Indigenous Knowledge, community safety, and research. As climate change intensifies, it is increasingly vital to center Indigenous and local communities in policy discussions and ensure that community-based observations inform these decisions. This session will share examples of programs from across the Arctic that are Indigenous-led and grounded in principles of Indigenous data sovereignty. It will also showcase the newly updated Atlas of Community-Based Monitoring in a Changing Arctic, which contains entries from projects across the circumpolar region with a focus on North America. The Atlas was launched in 2013 by the Inuit Circumpolar Council and the Exchange for Local Observations and Knowledge of the Arctic and has been updated to include new programs and features. Through shared dialogue, the session will explore opportunities for collaboration, cross-training, and respectful data stewardship across CBM initiatives. Together, we will discuss how coordinated practices can strengthen sustained Arctic observing systems, amplify Indigenous expertise and leadership, and advance equitable representation of Indigenous knowledge in regional and international contexts.

Goals:

1. Discuss strategies for ensuring that Indigenous and community-based observation data inform local, regional, and national policy and decision-making processes.
2. Examine how coordinated Indigenous-led monitoring programs contribute to long-term, sustainable observing networks that reflect community priorities and values.
3. Discuss how principles of Indigenous data sovereignty guide the governance, management, and sharing of observation data within and across these programs.

Times and meeting rooms:

Day	Time	Room	Topic
Tuesday	13:30-15:30	Richard Mortensen Stuen	Indigenous and local observations

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Investing in Salmon Observing for Arctic Resilience: Bridging Research, Funding, and Community Needs

Chairs:

Jamie O'Connor, Intertidal Consulting for the International Arctic Research Center, jamie@intertidalconsulting.com
Harmony Wayner, Alaska Conservation Foundation

Description:

This dialogue-centered session aims to bring together funders, salmon community members, and research leaders to explore how sustained, co-produced salmon observing can strengthen Arctic resilience. The Salmon Expert Panel, convened under the ResearchNetworking Activities for Sustained Coordinated Observations of Arctic Change (RNA CoObs) and the Sustained Arctic Observing Networks (SAON) Roadmap for Observing and Data Systems (ROADS) initiative, is advancing equitable and community-driven salmon observing systems in the Bristol Bay watershed of Alaska. Co-created by Indigenous leaders, local knowledge holders, fisheries managers, and researchers, the panel integrates ecological, social, and cultural knowledge to identify critical observing gaps from river to sea.

The session will include a presentation from Salmon EP co-leads on the work of the panel, followed by an open discussion on strategies for long-term investment, integration, and alignment across observing networks.

Goals:

1. Create a shared space for funders and implementers to identify collaboration pathways.
2. Prioritize funding strategies that center community well-being.
3. Generate actionable recommendations for the AOS closing plenary.

Relevant resources:
Nushagak-Mulchatna King Salmon Committee, Bristol Bay Science and Research Institute King Salmon Report. https://www.bbsri.org/king-committee

Donkersloot, Rachel et al. (2020). Assessing The Sustainability And Equity Of Alaska Salmon Fisheries Through A Well-Being Framework. 25(2). https://doi.org/10.5751/ES-11549-250218

Donkersloot, Rachel, Harmony Wayner, Danielle Ringer, AlexAnna Salmon, Jonathan Salmon, Courtney Carothers, Jessica Black, and Igiugig Village Council. "Immeasurable sovereignty: Indigenous well-being, fishery science, and sustainable governance." *Ecology and Society* 30, no. 4 (2025).

Times and meeting rooms:

Day	Time	Room	Topic
Wednesday	11:00-12:30	Mogens Zieler Stuen	Salmon Observing for Arctic Resilience

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Arctic ROADS as a Path for Inclusive, IPY-Scale Collaboration

Chairs:

Sandy Starkweather, University of Colorado, CIRES, sandy.starkweather@noaa.gov
Heikki Lihavainen, SIOS, director@sios-svalbard.org
Natasha Haycock-Chavez, University of Colorado Boulder, naha6486@colorado.edu
Emily Lescak (IARC, RNACoobs, elescak@alaska.edu)

Zoe Brasseur (SIOS, zoe.brasseur@sios-svalbard.org)

Description:

This series of three sessions will serve to advance and enable the ROADS process as an inclusive planning pathway for advancing ICAPR IV recommendations, IPY-Scale coordination, and engaging relevant new partners in the process.

Session 1 - How ROADS Can Enable IPY-Scale Action and Advance ICARP IV Results?

This session will set the stage by reviewing key lessons learned from establishing sustainable observing and data systems following the last IPY.

a. Keynote, David Hik: IPY 2007/2009 - What did we learn from the last IPY about leaving a legacy of observational programs, partnerships, and networks? What succeeded? What opportunities were missed? How can these successes inform SAON, AOS, ROADS and IPY5?

b. Reflections, Margaret Rudolf: ICARP IV recommendations for Observing/Data systems.

c. Panel discussion led by national and multi-national funding programs and organizations to better understand how we can support/position ROADS in the context of large international cooperations to respond to ICARP IV and plan for IPY5.

Panel: Organizational perspectives on Observing Actions for ICARP IV and IPY5
Moderated by Heikki Lihavainen

1. Arctic Science Funders Forum (David Hik)
2. Arctic Funders Collaborative (Aaron Poe)
3. Norway/NPI, chair of national IPY5 committee (Harald Steen)
4. ISAR8 and Non-Arctic States (Tesuo Sueyoshi)
5. Sami Council, Arctic and Environmental Unit (Gunn-Britt Retter)
6. ICAPR IV-IPY5-IASC perspective- (TBD)

Session 2 - Designing an Inclusive ROADS: Community Hubs, Benefit Frameworks, and Co-Produced Observing

In this interactive session, we will draw from the outcomes of the Indigenous-led monitoring and Co-Production of Knowledge sessions to dialogue about what is needed in ROADS to best support Indigenous empowerment in the process.

The driving questions for this session are: What is needed to better support Co-Production & Engagement throughout ROADS? What is the role of success metrics, benefit frameworks? How can ROADS help to shape understanding about the need for Community-led organization/coordinating hubs for efforts and support Indigenous-led monitoring? How does ROADS need to change to better enable this work?

Session 3 - From the present to future of ROADS engagement

In this session we will bring the experiences of current ROADS Expert Panels together with those curious about or interested in engaging in ROADS through a fun and interactive “pitch meeting” breakout groups where experienced ROADS practitioners can coach prospective Expert Panel groups toward understanding what ROADS might make possible for their efforts.

Goals:

1. Advance the ROADS concepts through dialogue, with an emphasis on better defining what needs to be done in Phase IV: Implementation of the process
2. Foster dialog around needed capacities related to Indigenous community empowerment within the process
3. Communicate and engage about the role of ROADS in future efforts, including IPY

Times and meeting rooms:

There is a ROADS Open Partnership meeting on Sunday, March 29 during ASSW. An introduction to ROADS and updates on the different expert panels will be presented during that time.

Day	Time	Room	Topic
Monday	16:00-18:00	Richard Mortensen Stuen	Readiness for Collaboration: How ROADS Can Enable IPY-Scale Action

Tuesday	8:00-9:30	Richard Mortensen Stuen	Designing an Inclusive ROADS: Community Hubs, Benefit Frameworks, and Co-Produced Observing
Wednesday	9:00-10:30	Preben Hornung Stuen	The present and future of ROADS engagement

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Data Systems

Chairs:

Chantelle Verhey, Carleton University, cverhey@gcrc.carleton.ca
Jan Rene Larsen, jan.rene.larsen@amap.no
Vanessa Raymond, vlraymond@alaska.edu
Oystein Godoy, o.godoy@met.no

Description:

The polar research data community has been actively looking to engage with other groups to better understand how we can support their data gaps and needs. This group is not just for data experts but anyone who interacts with data and wants to increase its impact. The goal of this working group is to set actionable priorities for the next 2-8 years as the polar community prepares for the upcoming International Polar Year. The data working group has historically shared initiatives and developments related to data systems, Indigenous data sovereignty, and data management. Are you interested in what observing assets currently exist? How to better utilize existing data systems for data sharing and consumption? Enhance the impact of your/ your organization's data through interoperability? How to practically enable data sovereignty principles? Then engaging with the data working group is a great opportunity to achieve a better understanding of the polar data ecosystem.

Actionable Data Towards IPY-5 (Session 1)
The session will focus on enhancing data management strategies towards IPY-5. Key presentations and discussions include evolving polar data management, data policies, and data publication, as well as the integration of data across different knowledge

domains. The session aims to engage a broad audience, including non-data specialists and data repository representatives.

Data Systems: Data as protection (**Session 2)**
This panel brings together Indigenous scholars, technologists, and practitioners working across AI, data governance and provenance, and sovereignty. We come from different places, but share a common concern: when we build systems, we are also shaping who decides, who benefits, and whose futures are made visible.

The conversation is grounded in lived experience and community-engaged work. Panelists draw from Iñupiaq, Ahtna, Métis, and Cayuga perspectives to explore how Indigenous governance frameworks, relational approaches to knowledge, and non-Western scientific traditions challenge dominant paradigms in AI, and data through language, history, memory, maps, and the future.

Rather than treating technology as neutral, we explore questions of reciprocity, accountability, and return: Who holds authority over data? What does consent look like in practice? What responsibilities do we carry when working with Indigenous communities?

This session is structured as both sharing and reflection. Each panelist's contribution offers a concrete example of a system or process, paired with a questioning prompt for participants to sit with, respond to, or carry forward into their own work.

Panelists:

Cana Uluak Itchuaqiyaq (University of Virginia)
Stephanie Russo Carroll (University of Arizona)
Dane Malenfant (MILA)
Jeff Doctor (Animikii)

Conveners:
Chantelle Verhey (Arctic Data Committee)
Leasi Vanessa Lee Ramyond (Arctic Data Committee)
Maya Reda Williams (IARPC Data Management)

A detailed session schedule is available here.

Goals:

1. Engage with other Working groups at the AOS
2. Set actionable goals to be carried out by the next AOS

Times and meeting rooms:

Day	Time	Room	Topic
Tuesday	8:00-9:30	Preben Hornung Stuen	Data Systems
Wednesday	11:00-12:30	Richard Mortensen Stuen	Data Systems: Data as protection

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Technology

Chairs:

Maribeth Murray, University of Calgary, Canada, murraym@ucalgary.ca

Øystein Godøy, Norwegian Meteorological Institute, steingod@met.no

Craig Tweedie, University of Texas at El Paso, USA, ctweedie@utep.edu

Description:

Advances in both our understanding and capacity to observe the Arctic are often coupled to the development and/or application of novel technologies. The harsh conditions are challenging for sustained observing necessary to advance our understanding. In this session, which will utilize expert panels, short presentations, open discussion, and flash talks, we will showcase successes, limitations, and challenges associated with the technological advancement of Arctic Observing. Specifically, we will explore innovations in Artificial Intelligence, and monitoring technologies like drones, remote sensing in general, and in situ. Through case studies performances in various aspects of scale, cost, disciplinary focus, operational perspectives and stage of development are addressed. We welcome participation from an international audience and

representation from a wide range of interest groups spanning communities, researchers, agencies, innovators, industry, policy makers, educators and others.

Goals:

1. Celebrate the novelty of discovery and observation using innovations in technology.
2. Derive common drivers of success, limitation, and failure associated with the development and application of novel technologies for enhanced Arctic Observing and Discovery.
3. Identify 'pinch points' that could be addressed with attention from specific interest groups.

Times and meeting rooms:

Day	Time	Room	Topic
Tuesday	8:00 - 9:30	Mogens Zieler Stuen	AI and Machine Learning
Tuesday	10:00 - 12:00	Mogens Zieler Stuen	Drones and remote sensing
Tuesday	13:30 - 15:30	Mogens Zieler Stuen	Drones and remote sensing

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Centering Indigenous Observations in Arctic Marine Wildlife Management and Conservation

Chairs:

Roberta Glenn, Alaska Arctic Observatory and Knowledge Hub/University of Alaska Fairbanks , rjglenn@alaska.edu

Donna Hauser, Alaska Arctic Observatory and Knowledge Hub/University of Alaska Fairbanks , dhauser2@alaska.edu

Arctic Observing Summit 2026

Arctic Science Summit Week
Aarhus, Denmark
March 30 - April 1

Description:

This session, led by the Alaska Arctic Observatory and Knowledge Hub (AAOKH), will bring together diverse perspectives on Indigenous-led and community-based approaches to Arctic marine wildlife conservation. We invite participation from early career researchers, Indigenous Knowledge holders, Arctic community members, marine conservation practitioners and international colleagues engaged in similar work across the circumpolar north. Together, we will explore how Indigenous-led observations and priorities strengthen wildlife co-management, inform policy, and contribute to more sustainable futures for Arctic ecosystems and the communities that depend on them. The session is intended as a space for dialogue, exchange, and collaboration across knowledge systems and borders.

Goals:

1. Identify existing pathways for Indigenous-led observations to inform marine conservation and wildlife management.
2. Determine best practices for making connections with relevant decision-makers and data service providers.
3. Catalogue opportunities and challenges for applying Indigenous-led observations to support marine conservation and sustainable food security.

Times and meeting rooms:

Day	Time	Room	Topic
Wednesday	9:00 - 10:30	Richard Mortensen Stuen	Arctic Marine Wildlife Management and Conservation

Arctic Observing Summit 2026

Arctic Science Summit Week
Aarhus, Denmark
March 30 - April 1

White papers and short statements

White Papers

How Working Across Indigenous Knowledges and Academic Scientific Systems Strengthens Research Quality and Societal Relevance

Citation and link:

Hauri, C., Andreasen, J., Aracri, S., Assmann, J. J., Divine, L., Black, J., Culha, C., Ghigliotti, L., Graham, M., Gryba, R., Hauser, D., Huntington, H., Itchuaqiyaq, C. U., Johnson, N., Ksenofontov, S. S., Lafferty, A., Lescak, E., Morgenstern, A., Ogawa, M., Sugiyama, S., Walch, D. M. R. (2026, February 24). How Working Across Indigenous Knowledges and Academic Scientific Systems Strengthens Research Quality and Societal Relevance. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18751167

Tags:
Co-production of Knowledge; Indigenous observing; Societal benefits

Bridging Arctic Data Gaps Through Co-designed Citizen Science: The ISOSCAN experience

Citation and link:

Tomej, K., Duedahl, E., Fischer, B., Lennert, A. E., Sodemann, H., & Zwart, C. (2026, February 23). Bridging Arctic Data Gaps Through Co-designed Citizen Science: The ISOSCAN experience. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18749141

Tags:
Co-production of Knowledge; Snow; Observing activities

Visions and Policy recommendations for a future Arctic Observing System of Systems

Citation and link:

Karcher, M., Sundfjord, A., Wilkinson, J., Murray, M., & Arctic PASSION project team. (2026, February 23). Visions and Policy recommendations for a future Arctic Observing System of Systems. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18749389

Tags:
Policy

Bridging knowledge gaps in tundra vegetation ecology in a warmer future Arctic

Citation and link:

Orndahl, K., Barrio, I. C., Bjerke, J. W., García Criado, M., Epstein, H., Frost, G., Gerland, S., Goetz, S., Høgda, K. A., Parmentier, F.-J., Ravolainen, V., Myers-Smith, I., Tømmervik, H., & Winquist, E. (2026, February 23). Bridging knowledge gaps in tundra vegetation ecology in a warmer future Arctic. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18749541

Tags:
Ecology; observing activities

Reframing Social Research in the Arctic: Humanizing and Indigenizing Pathways to Improve Research Quality and Sociocultural Relevance

Citation and link:

Rozanova-Smith, M., & Petrov, A. (2026, February 23). Reframing Social Research in the Arctic: Humanizing and Indigenizing Pathways to Improve Research Quality and Sociocultural Relevance. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18749664

Tags:
Co-production of Knowledge; Social science; Societal benefits

From Concept to Collaboration: The Arctic Acoustic Observing Network

Citation and link:

Stafford, K. M., Ahonen, H., Simon, M., Thomisch, K., Halliday, W., Jones, J., La, H. S., Marcoux, M., rasmussen, . marianne ., & Szesciorka, Ph.D., A. (2026, February 23). From Concept to Collaboration: The Arctic Acoustic Observing Network. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18748965

Tags:
Observing activities; Marine

Observational capacity inventories: potential uses and specifications

Citation and link:

Bradley, A., Larsen, J. R., Manley, W., Lihavainen, H., Eicken, H., & Divine, L. (2026, February 27). Observational capacity inventories: potential uses and specifications. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18807101

Tags:
Data; Policy; Inventories

Metrics for Evaluating Accessibility of Research to Indigenous Communities

Citation and link:

Nguyen, A., Rudolf, M., Lescak, E., Schulz, K., & Johnson, N. (2026, March 15). Metrics for Evaluating Accessibility of Research to Indigenous Communities. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.19025906

Tags:
Co-production of Knowledge

Advancing shared visions for Arctic observing: A brief status assessment of RNA CoObs and ArcticPASSION projects' contribution to SAON Arctic ROADS

Citation and link:

Eicken, H., Bradley, A., Glenn, R., Hatta, M., Karcher, M., Lescak, E., STARKWEATHER, S., wilkinson, . jeremy ., Larsen, J. R., Lihavainen, H., O'Connor, J., Rudolf, M., Strahlendorff, M., Waigl, C., Wayner, H., & Wells, T. (2026, March 16). Advancing shared visions for Arctic observing: A brief status assessment of RNA CoObs and ArcticPASSION projects' contribution to SAON Arctic ROADS. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.19051077

Tags:
ROADS; Policy

Short statements

The new GTN-P Data Platform: global long-term permafrost observations

Citation and link:

Lübker, T., Irrgang, A. M., Laboor, S., Grosse, G., Lantuit, H., & Streletskiy, D. (2026, February 23). The new GTN-P Data Platform: global long-term permafrost observations. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18749210

Tags:
Permafrost; Data; Observing activities

EMODnet: Expanding the EU in situ marine data service offer for the Arctic

Citation and link:

Nolan, J., Larkin, K., Delaney, C., Beja, J., Schmitt, T., GIORGETTI, A., Kaskela, A., Pititto, A., Novellino, A., Karvinen, V.-J., Iona, A. (Sissy) ., & Schaap, D. (2026, February 23). EMODnet: Expanding the EU in situ marine data service offer for the Arctic. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18749262

Tags:
Marine; Data; Societal Benefits

Permafrost Management Through City Planning and Design: Linking Observations to Snow, Meltwater, and Infrastructure Practices in Utqiaġvik, Alaska

Citation and link:

Jull, M., Cho, L., Fong, J., Epstein, H., Ekimova, V., & UVAARC Team. (2026, February 24). Permafrost Management Through City Planning and Design: Linking Observations to Snow, Meltwater, and Infrastructure Practices in Utqiaġvik, Alaska. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18751276

Tags:
Permafrost; Observing activities; Societal benefits

Building and Sharing Inventories of Observational Capacities for Discovery and Integration across a Spectrum of Arctic Observing Systems

Citation and link:

Manley, W., Bradley, A., Shapiro, H., Larsen, J. R., McAllister, S., & Allen, D. (2026, February 27). Building and Sharing Inventories of Observational Capacities for Discovery and Integration across a Spectrum of Arctic Observing Systems. Arctic Observing Summit (2026), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18806845

Tags:
Inventories; Data

Early Career Voices in Arctic Observing: Outcomes from the Polar Early Career World Summit

Citation and link:

Dryak-Vallies, M., Strand, S. M., Payne, M., & Schlindwein, A. (2026, March 2). Early Career Voices in Arctic Observing: Outcomes from the Polar Early Career World Summit. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.18839000

Tags:
Career development; Policy

Sustainable observations for sustainable Arctic environmental forecasting

Citation and link:

Tjernström, M. (2026, March 25). Sustainable observations for sustainable Arctic environmental forecasting. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.19225688

Tags:
Forecasting; Observing activities

Collaborative Socio-Ecological Systems Research: A web-based, interactive data mapping and analysis system for integrated research and community engagement

Citation and link:

Shiklomanov, A., Prusevich, A., Lammers, R., Kuklina, M., Kuklina, V., Petrov, A. N., & Rozanova-Smith, M. (2026, March 31). Collaborative Socio-Ecological Systems Research: A web-based, interactive data mapping and analysis system for integrated research and community engagement. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.19352396

Tags:

Observing activities; Data sharing

Poster Abstracts

Poster number	Poster title	Lead author name
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2	Data Management in Japan's Arctic Research Projects (ArCS3)	Hironori Yabuki
3	Enabling Discovery: A New Registry of Polar Observing Networks (RoPON)	William Manley
4	Developing an IPY Arctic Access Programme in support of implementation of IPY and international research priorities	Elmer Topp-Jørgensen
5	A sustainable observation system for Arctic environmental forecasting	Michael Tjernström
6	Greenland Ecosystem Monitoring (GEM) programme	GEM secretariat/Marie Frost Arndal
7	ArcLoRaM – A Sustainable, Scalable Communication Protocol for Arctic Observing Systems	Simon LANGLAIS
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9	Strengthening the Arctic Observing System: What the AOS community can do next - with insights from the Arctic PASSION project	Lisa Grosfeld
10	Advancing shared visions for Arctic observing – the status of SAON Arctic ROADS implementation efforts and a call to action	Hajo Eicken
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12	From sumps to sediments: tracing the legacy of oil and gas operations in Arctic lakes	Emma Cameron
13	Collaborative Art–Science Practices and Pedagogies on the Juneau Icefield	Hannah P. Mode

14	Connecting undergraduate education to Arctic observing: Integrating data analysis with interdisciplinary learning from the classroom to Greenland	Michelle Koutnik
15	Integrating Art and Citizen Science into Arctic Observation: Lessons Learned from a Developing a Field Course at Toolik Field Station	John Smelter
16	The Global Human Settlement Layer (GHSL) Arctic edition (1975-2030): Population and settlement data tailored to a region of increasing importance	Johannes H. Uhl
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19	Processes controlling ozone concentration at a high Arctic site	Henrik Skov
20	ELEVATE - Implementing new technologies in alpine monitoring programs	Arvid Sjöberg
21	Rapid Detection of Panarctic Permafrost Region Disturbances with Remote Sensing and Deep Learning	Ingmar Nitze
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23	Resilient Hydrogen Storage for the Arctic Through On-Site Additive Manufacturing	Marco Brander
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25	The Canadian Arctic-Subarctic Biogeoclimatic Ecosystem Classifciation System (CASBEC): A Useful Tool for Designing Long-Term Monitoring in Tundra Ecosystems	Dr. Donald S. McLennan
26	Navigating Actionable Science in the Arctic: Addressing the Training Gap	Margaret Rudolf
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AOS Poster 1:

From Satellite to Safety: Connecting Arctic Observations to Community Resilience

Hazel Shapiro, UIC Science (hazel@iarpccollaborations.org)

Sandy Starkweather, CU Boulder CIRES, sandy.starkweather@noaa.gov

In the face of rapid Arctic change, effective disaster resilience depends on comprehensive Earth observation (EO) systems, yet despite ongoing efforts, Arctic observing capabilities face critical gaps. Addressing this requires coordinated, systems-level solutions integrating federal systems, non-federal expertise, Indigenous knowledge, and local capabilities.

The U.S. Arctic Observing Network (US AON) developed BENEFIT (Benefit Evaluation | Network Exploration | Find gaps | Improve Together)—a participatory assessment method combining societal benefit frameworks with expert elicitation to systematically evaluate EO capabilities and identify critical gaps. Through 68 scoping dialogues with federal agencies, academic partners, Tribal organizations, and community groups, we assessed risk management and hazard mitigation in Alaska across four topics: coastal flooding, wildfires, aviation weather, and landslides. The process revealed key strengths—satellite systems, data coalitions like Alaska Water Level Watch, and boundary-spanning organizations—alongside significant gaps in ground-based monitoring, telecommunications infrastructure, and community-specific baseline data.

Findings demonstrate that fragmented agency responsibilities, spatial observation gaps, and inadequate telecommunications create cascading impacts on community safety, subsistence activities, and infrastructure resilience. This work provides a replicable framework for rigorous, multiagency Arctic EO assessment. Visit our poster to learn more!

AOS Poster 2

Data Management in Japan's Arctic Research Projects (ArCS3)

Hironori Yabuki, National Institute of Polar Research, Tokyo, Japan (yabuki.hironori@nipr.ac.jp)

The Arctic region is currently experiencing the most pronounced increase in average temperature worldwide as a consequence of global warming, and it is projected to be among the regions most severely affected by future climate change. Transformations occurring in the Arctic exert substantial influences on the global climate system through complex interactions among

the atmosphere, ocean circulation, and the cryosphere. These climatic changes affect not only human activities but also the ecosystems that support Arctic flora and fauna. Despite ongoing research efforts, many aspects of environmental change in the Arctic—including observational records and the mechanisms driving climatic variability—remain insufficiently understood. Advancing our comprehension of these multifaceted systems requires integrated research supported by sustained, long-term observations in the Arctic.

The Arctic and Antarctic Data archive System (ADS) aims to archive and disseminate a wide range of observational datasets—including atmospheric, oceanic, terrestrial, and ecological data—as well as model simulation outputs, thereby promoting their broad scientific utilization. ADS functions as the central data repository for Arctic research conducted in Japan. Furthermore, we seek to enhance data interoperability and strengthen collaborative frameworks with various Arctic data centers.

AOS Poster 3

Enabling Discovery: A New Registry of Polar Observing Networks (RoPON)

William Manley, University of Colorado Boulder (william.manley@colorado.edu)

Halldór Jóhannsson (Arctic Portal, halldor@arcticportal.org), Arundeep Singh (Arctic Portal, arundeep@arcticportal.org), Anseok Joo (Arctic Portal, anseok@arcticportal.org), Jan Rene Larsen (Arctic Monitoring and Assessment Programme, jan.rene.larsen@amap.no), Shannon McAllister (Arctic Institute of North America, shannon.mcallister@ucalgary.ca), and Members of the Polar Observing Assets Working Group (polarobservingassets.org)

A fundamental challenge exists for optimizing the study of climate and environmental change in the polar regions. Observing infrastructures and activities – such as monitoring sites, mobile platforms, research projects, field campaigns, and observing programs – are deployed in a diverse fashion across countless efforts. Thus, it is difficult to strategically assess status and gaps because most inventories of “observing assets” are limited in scope. To help address this, a new Registry of Polar Observing Networks (RoPON) has been released (https://polarobservingregistry.org/). This is a catalog of systems or organizations that conduct or coordinate observation and monitoring at high latitudes, typically with data management, research stations, platforms, and instrumentation. RoPON also displays portals that are not observing networks *per se*, but which compile and share structured information about observing activities and infrastructures. This resource was created by the Arctic Portal in collaboration

with the SAON Polar Observing Assets Working Group (POAwg), which has a goal of making asset-level metadata more findable, accessible, interoperable, and reusable. Feedback is appreciated. RoPON is designed to help: Co-locate and optimize limited resources; avoid duplicated effort; better inform local communities; clarify best practices for asset-level metadata sharing; and guide assessment & planning to better meet observing goals.

AOS Poster 4

Developing an IPY Arctic Access Programme in support of implementation of IPY and international research priorities

Elmer Topp-Jørgensen, INTERACT Non-Profit Association (jetj@ecos.au.dk)
Hannele Savela, University of Oulu, hannele.savela@oulu.fi
Vanessa Spadetto, INTERACT Non-Profit Association, vanessa@interactassociation.org

Rapid Arctic climate and ecosystem changes demand coordinated, circumarctic research aligned with international science priorities. The 5th International Polar Year (IPY) and the 4th International Conference on Arctic Research Planning (ICARP IV, 2025–2035) define key scientific and societal priorities for the coming decade. Access to Arctic research infrastructures is essential to address these priorities at scale.

INTERACT, a circumarctic network of 99 research stations with extensive experience in coordinating international access programmes, aims to develop and seek funding for an IPY Arctic Access Programme (IPY-AAP) together with key Arctic stakeholders to support the implementation of IPY and ICARP IV research priorities. Building on over a decade of experience supporting around 550 research projects, the IPY-AAP will provide coordinated access to Arctic research stations, vessels, and data infrastructures.

Once the operational budget is secured, the programme will offer in-person, remote, and virtual access modalities, covering researcher access costs and infrastructure staff time, while promoting open data, open-access publishing, and IPY-focused outreach. To ensure alignment with international priorities, the IPY-AAP will be co-designed with key Arctic stakeholders, including early-career researchers and Indigenous representatives. This initiative aims to provide a robust framework enabling excellent Arctic science during the IPY ramp-up phase and beyond.

AOS Poster 5

A sustainable observation system for Arctic environmental forecasting

Michael Tjernström, Swedish Polar Research Secretariat (michael.tjernstrom@polar.se)

The Arctic is changing rapidly and the consequences of Arctic amplification of global warming is evident in the whole Arctic, across all domains. These changes challenge our capabilities for forecasting the environment, on time scales from the weather on hours to days, ocean and sea-ice for weeks, months and years, to projecting climate change for decades, all parts of what we today refer to as “Earth system” or “environmental” forecasting. Fundamental for both understanding and modeling is observations. Assimilating observations into models has become a corner stone for both weather forecasting and climate monitoring. Yet there are vast areas of the Arctic with few or no observations. For the Arctic Ocean region, very few in situ observations exist and even with optimistic technological development scenario, it is unlikely that sufficient in-situ atmosphere and ocean profiling, and sea-ice information will become available. Therefore, we should consider an observing system that makes better use of existing components. A coordinated system optimized around assimilation of satellite observations, supported by autonomous systems and complemented by regular icebreaker-borne science expeditions would provide a forward-looking framework, if only we could coordinate better: between the weather forecasting, climate modeling and science observing communities.

AOS Poster 6

Greenland Ecosystem Monitoring (GEM) programme

GEM secretariat/Marie Frost Arndal, Aarhus University (g-e-m@au.dk)

Torben Røjle Christensen <torben.christensen@ecos.au.dk>, Aarhus University,

The Greenland Ecosystem Monitoring (GEM) programme provides one of the Arctic’s longest and most comprehensive records of environmental change. Since 1995, GEM has documented how rapid warming affects climate, cryosphere, ecosystems, and biodiversity across Greenland’s High and Low Arctic regions. This poster highlights progress under the 2022–2026 strategy, integrating results from climate, terrestrial, freshwater, and marine monitoring. Long-term observations reveal clear trends in glacier retreat, shifts in snow and permafrost conditions, and increasing climate variability. Combined ground measurements, remote sensing, and modelling improve understanding of carbon, water, and energy exchanges, helping refine

regional and pan-Arctic climate models. Ecosystem studies show changing vegetation productivity, altered coastal marine dynamics driven by sea ice loss and runoff, and emerging ecological risks such as harmful algae. Expanding biodiversity monitoring—including eDNA, autonomous sensors, and drones—tracks shifts in species interactions and food webs. Cross ecosystem studies illuminate how carbon and nutrients move from land to fjords, informing assessments of “blue carbon” potential in Greenland’s coastal systems. GEM’s open, FAIR compliant database accelerates research and supports education, policy, and international collaborations. As it prepares for 2027–2031, GEM aims to enhance interoperability, near real time products, early warning indicators, and integrated forecasting to better understand and anticipate Arctic change.

AOS Poster 7

ArcLoRaM – A Sustainable, Scalable Communication Protocol for Arctic Observing Systems

Simon LANGLAIS, Technical University of Denmark (srcla@dtu.dk)

Erik Gottschalk erikg@dtu.dk , Martin N. Petersen mnpe@dtu.dk

The Arctic’s harsh, remote environments demand innovative, resilient communication solutions to support long-term scientific observation. ArcLoRaM (Arctic Long-Range Mesh) addresses these challenges through a versatile mesh-of-stars topology and time-synchronized communication that maximizes sleep time for transmission nodes, drastically reducing energy consumption. Its decentralized power-aware routing further ensures adaptability and efficiency.

The protocol offers a dual range-data rate trade-off: deployments can span Belgium-sized areas at low data rates or focus on kilobits-per-hour collection over smaller zones. Unlike satellite dependency, manual offloading, or LoRaWAN, ArcLoRaM provides intrinsic scalability and self-healing capabilities, while its shared infrastructure model distributes deployment and maintenance costs across multiple experiments.

A custom simulation tool supports deployment planning, and early testing confirms the soundness of the protocol’s logic, validating its energy efficiency, data throughput, and collision avoidance under realistic Arctic conditions. ArcLoRaM empowers scientists to overcome infrastructure limitations, enabling continuous, high-quality observations essential for climate research and environmental monitoring.

AOS Poster 8

The SESS Report as a Framework for Multidisciplinary Arctic Observations

Zoé Brasseur, Svalbard Integrated Arctic Earth Observing System Knowledge Centre (SIOS-KC)(zoe.brasseur@sios-svalbard.org)

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Ashley Morris, Svalbard Integrated Arctic Earth Observing System Knowledge Centre (SIOS-KC), ashley.morris@sios-svalbard.org
Daan Kivits, Svalbard Integrated Arctic Earth Observing System Knowledge Centre (SIOS-KC), daan.kivits@sios-svalbard.org
Rudolf Denkmann, Svalbard Integrated Arctic Earth Observing System Knowledge Centre (SIOS-KC), rudolf.denkmann@sios-svalbard.org
Øystein Godøy, Svalbard Integrated Arctic Earth Observing System Knowledge Centre (SIOS-KC), o.godoy@sios-svalbard.org
Heikki Lihavainen, Svalbard Integrated Arctic Earth Observing System Knowledge Centre (SIOS-KC), director@sios-svalbard.org

The State of Environmental Science in Svalbard (SESS) report, published annually by the Svalbard Integrated Arctic Earth Observing System (SIOS) since 2019, is a key tool for communicating scientific advances to the research community, stakeholders, and the public. The report synthesizes the current state of knowledge on key Earth System Science parameters in Svalbard, identifies gaps in the existing observing system, and outlines priorities for future observations.

The SESS report supports the development of Svalbard's multidisciplinary observing system through bottom-up contributions grounded in scientific expertise and needs. It also serves as a dynamic platform for fostering interdisciplinary collaboration and encouraging dialogue around emerging scientific approaches.

In the context of the upcoming 5th International Polar Year (IPY) in 2032-2033, the SESS report can act both as a reference point for the current state of research in Svalbard and as a foundation for defining future research priorities and joint scientific efforts aimed at understanding environmental change at regional and global scales.

In this poster, we present the current structure of the SESS report and demonstrate its potential as a cohesive and comprehensive tool for scientific coordination during the 5th IPY and beyond.

AOS Poster 9

Strengthening the Arctic Observing System: What the AOS community can do next - with insights from the Arctic PASSION project

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The Arctic PASSION project brought together researchers, economists, Indigenous and local knowledge holders, policy and decision-makers from across the Arctic and beyond to jointly develop a more interconnected and equitable Arctic Observing System of Systems (AOSS). The project developed practical services for the Arctic and global society, promoted inclusive research practices, and demonstrated how Indigenous, local, and scientific knowledge can complement each other. It also improved observation and modelling activities, enhanced coordination within AOSS networks, and built stronger dialogue between science and policy to align information needs with societal priorities.

This poster highlights the key outcomes of the project and provides recommendations for the AOS community. It invites conference participants to explore how their work can contribute to a more integrated, equitable and impactful observation system that supports both Arctic societies and global understanding.

AOS Poster 10

Advancing shared visions for Arctic observing – the status of SAON Arctic ROADS implementation efforts and a call to action

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Arctic ROADS* is a flexible and supportive framework to convene researchers, information users, decision makers, and Indigenous Knowledge holders to build and document a shared understanding of observing needs that can be acted on to benefit Indigenous communities and society at large.

*Roadmap for Arctic Data & Observing Systems by the Sustaining Arctic Observing Networks initiative of the Arctic Council and the International Arctic Science Committee

AOS Poster 11

Analyzing Rain on Snow Events across Alaska using Dynamically Downscaled Datasets

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Rain-on-Snow (ROS) events occur when rain falls on snow-covered frozen ground then freezes forming a layer of ice. In high northern latitude regions such as Alaska, ROS events can cause significant risks to transportation, wildlife, and power infrastructure, as ice cover on vegetation and built-up surfaces may persist until the spring thaw. Understanding the spatial and temporal distribution of ROS events across Alaska is critical for emergency preparedness and climate adaptation strategies. Alaska's complex terrain and scarce observational data coverage limit detailed analysis, but reanalysis datasets such as ECMWF Reanalysis v5 (ERA5), dynamically downscaled to 4km spatial resolution, help bridge this gap by capturing fine-scale regional variability. This data spans 1950-present, providing a long-term dataset to examine historical trends and regional differences across Alaska's diverse landscapes.

Results show varying seasonal and spatial patterns at the municipal/borough scale for major population centers in mainland Alaska. ROS events occur primarily early in the cold season, with the peak frequency and associated rainfall in November and December. Coastal areas experience higher hours and cumulative precipitation of ROS than interior Alaska. These results provide a baseline for assessing changes in ROS frequency, intensity, and seasonality under different climate scenarios to support adaptation and resilience planning across Alaska.

AOS Poster 12

From sumps to sediments: tracing the legacy of oil and gas operations in Arctic lakes

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Legacy oil and gas infrastructure across the Arctic remains embedded within permafrost landscapes and represents a potential source of contamination to nearby lakes. In the lake-dense Mackenzie Delta region of Canada's Northwest Territories, drilling fluids from past exploration were disposed of in permafrost landfills known as drilling mud sumps, which were assumed to provide long-term containment. Fluids containing oil-derived compounds and saline constituents could disrupt freshwater systems if released, a risk amplified by ongoing permafrost thaw. To investigate these processes, we examined lakes downstream of abandoned sumps along the Inuvik-Tuktoyaktuk Highway. Surface sediments and sediment cores were analyzed using a multi-proxy approach including major and trace element geochemistry (XRF, ICP-MS), petroleum and lipid biomarkers (GC-MS), and subfossil Cladocera to assess drilling fluid migration and ecological shifts over the past ~100 years. Preliminary data from sediment

records reveal downcore shifts in geochemical and biological indicators. While these patterns cannot be attributed to a single mechanism, they are consistent with both drilling-related inputs and thaw-driven changes in catchment hydrology and material transport. These findings demonstrate that lake sediments preserve both environmental and industrial signals, serving as valuable archives to reconstruct geochemical and ecological changes in Arctic regions with limited long-term monitoring.

AOS Poster 16

The Global Human Settlement Layer (GHSL) Arctic edition (1975-2030): Population and settlement data tailored to a region of increasing importance

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The Arctic region is increasingly experiencing climatic, ecological, economic, and geopolitical changes. To assess risk exposure and vulnerabilities of Arctic populations and built infrastructure, detailed understanding of settlement patterns and population dynamics in the Arctic is crucial. The Global Human Settlement Layer (GHSL) project, producing global geospatial data on human presence on Earth, has released an Arctic-centered dataset, facilitating demographic and settlement-related research and data-driven decision making in the Arctic region: the GHSL Arctic edition R2025A. The GHSL Arctic edition contains open gridded data at up to 100m resolution, including estimates of built-up area, building height and volume, derived from the integration of Earth observation data from the Landsat and Sentinel missions, in an Arctic-centered cartographic projection. Moreover, the GHSL Arctic edition provides 100-m gridded population estimates and includes a taxonomy of the rural-urban continuum (Degree of

Urbanisation), as well as an infrastructure-focused settlement model tailored to the Arctic. These data have been evaluated against different global and Arctic-focused datasets, providing a robust baseline for multi-faceted, spatio-temporal analyses of Arctic population and built infrastructure at fine spatial detail, and over long time periods from 1975 to 2030. In this contribution, we will showcase the data and highlight exemplary analytical outcomes.

AOS Poster 13

Collaborative Art–Science Practices and Pedagogies on the Juneau Icefield

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This poster presents an eight-year, place-based collaboration between visual artist Hannah P. Mode and glaciologist Elizabeth Case within the Juneau Icefield Research Program (JIRP) in Southeast Alaska (Lingít Aaní / Tlingit Land). We examine how sustained art–science co-teaching has reshaped practices, pedagogies, and institutional norms within this long-standing Arctic research program. Our work is informed by anticolonial approaches that treat science as an ongoing, relational practice rather than a neutral or extractive product, foregrounding accountability to place, people, and histories of exclusion within Earth and climate sciences. Rather than positioning art solely as outreach or illustration, or science as a neutral, objective baseline, we treat both disciplinary practices as rigorous, process-based modes of inquiry that are intentionally interwoven.

The poster highlights a series of field-based workshops integrating abstraction, zines, photogrammetry, hydrological measurement, sewing, and photographic processes alongside glacier observation and scientific data collection. By modeling co-teaching and co-research as epistemic practices grounded in duration, care, and negotiated trust, this work contributes to Arctic observing by addressing the human dimensions of knowledge production and demonstrating how integrated art–science approaches can extend the epistemic width of long-standing observing programs without sacrificing scientific rigor.

AOS Poster 14

Connecting undergraduate education to Arctic observing: Integrating data analysis with interdisciplinary learning from the classroom to Greenland

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We develop interdisciplinary undergraduate courses focused on the Arctic, including a study abroad course to Greenland. Our student participants span a range of disciplines including the physical sciences, engineering, social sciences, and humanities, with some pursuing an Arctic Studies minor. Across these courses, we integrate analysis of Arctic data as part of teaching about the Arctic environment, social dimensions of environmental change, and community-led priorities for decision making. Tools and resources include QGIS with QGreenland, satellite and ground-based datasets, and published outcomes resulting from co-production of knowledge. In our Greenland abroad course, student projects center on issues where data analysis and shared knowledge serve a societal benefit in Greenland, with graduate students mentoring undergraduate teams to blend a range of perspectives in an introductory, multi-week format. We are interested in learning how Shared Arctic Variables that are interdisciplinary and multi-scale by design could further serve as frameworks for teaching. More broadly, the values embedded in our courses that emphasize societal benefit, equitable engagement, and local-to-global linkages align with the principles of SAON's ROADS. We present our experience in undergraduate education and invite engagement from AOS participants to share insight, opportunities, and models for strengthening connections between education and Arctic observing.

AOS Poster 15

Integrating Art and Citizen Science into Arctic Observation: Lessons Learned from a Developing a Field Course at Toolik Field Station

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Integrating art, science, and place-based learning offers a powerful way to enhance Arctic observation. We present a model for a one-week, intensive undergraduate field course focused on convergent approaches to documenting Arctic environmental change.

Students utilize both traditional naturalist techniques and contemporary practices, weaving art and science to deepen their understanding of socioecological systems. The six-day journey travels through Alaska's boreal forest, across the Brooks Range to Toolik Field Station, and finally to the Arctic Ocean. Students encounter the juxtaposition of some of North America's most remote wildernesses, while also seeing the industrial infrastructure of one of the continent's largest oil discoveries. Participants document flora, fauna, and geological features, contributing data to global networks through the NASA GLOBE Observer app and iNaturalist. Simultaneously, they refine their personal observation skills through nature journaling and photography.

As the course enters its second season in 2026, we reflect on lessons learned applicable to similar field-based curricula. We also propose broader research questions regarding the long-term impact on students who engage in integrated art-science field experiences on their self identity and resilience thinking.

AOS Poster 17

Blended altimetric observations of dynamic ice sheet change in Greenland

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NASA ICESat-2 Science Team, and notably including Ben E. Smith and Ian R. Joughin

In Greenland, rapid glacier retreat and acceleration has resulted in seasonal-to-multiyear patterns of marginal thinning as well as continued ice sheet volume loss. In addition to increased drawdown of ice at the margins by outlet glaciers, negative anomalies in surface mass balance from enhanced summer melt and reduced snow accumulation also contribute to the net elevation change signal. Here we show how combined observations of laser altimetry from ICESat-2, coupled with available DEMs from contemporaneous imagery, can be used to map elevation signals in greater detail, and improve partitioning of dynamic and atmospheric drivers of ice sheet mass change. In particular, we will focus on short term (seasonal) scales of

change and strengths and limitations of current sensing networks for several regions across the ice sheet. Finally, we will explore future possibilities for altimetry and remote sensing of elevation change in the Arctic through the Earth Dynamics Geodetic Explorer (EDGE) mission, which was recently selected as a future satellite mission within NASA's Earth System Explorers program.

AOS Poster 18

Observation of trends in methane concentrations in the Arctic atmosphere

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Methane (CH4) is the second most important anthropogenic greenhouse gas contributing to about 20% of radiative forcing since the pre-industrial era. Changing the methane rate from 700 to 2000 ppb between 1850 and 2021 has shown an increase of 186% since the industrialization. The balance of surface sources and sinks determines the global methane budget. Surface sources include methane originating from biogenic, thermogenic, pyrogenic or mixed sources. Dominant sinks include methane oxidation by the hydroxyl radical (OH) (Saunois et al. 2016). The sinks and sources are the drivers of the growing concentration of CH4 in the atmosphere but also the drivers of the seasonal variation of the CH4 concentrations. Arctic methane concentration measurements reveal an annual variation, with a higher concentration in late winter and a minimum in summer. The annual amplitude varied from 70-80 in the 1980’s but the amplitude has decreased from 1994 to about 2015 and is now about 40-50 ppb. However, since 2017 measurements indicates the amplitude has become constant. To enhance our understanding of the processes and drivers causing the decreasing trend in the seasonal amplitude followed by a more constant amplitude we have analyzed data from ICOS high-resolution Arctic observations.

AOS Poster 19

Processes controlling ozone concentration at a high Arctic site

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Arctic surface ozone is an important short-lived-climate-forcer (SLCF) as it interacts with both solar and infrared light and it is the third most important greenhouse gas. Furthermore, ozone is also noxious to vegetation and humans. Surface ozone (O3) in the High Arctic exhibits substantial seasonal variability that is very different from more southern locations. We have previously described the special pattern of ozone depletion events occurring every spring. Very little attention has been given to the ozone in the summer months despite that ozone can affect climate more due to the 24 hour daylight at this time of the year and that surface ozone level is driven by complex interactions between photochemistry, long-range transport, and boundary layer dynamics. We will present a detailed analysis of factors affecting the summer concentrations at Villum Research Station in Northeast Greenland using a complex set of analysis tools on the 30 years of measurements combined with modelling results using the Danish Eulerian Hemispheric Model (DEHM).

AOS Poster 20

ELEVATE - Implementing new technologies in alpine monitoring programs

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Environmental monitoring creates a foundation for understanding our natural environment and making informed policy and management decisions. In Sweden, monitoring of open landscapes and habitats is gathered under the NILS (National Inventories of Landscape in Sweden) program. One such habitat is the alpine areas in Northwestern Sweden. The NILS alpine inventory relies on a two-stage inventory design where satellite-derived wall-to-wall models predict which areas that should be visited by field personnel. Ensuring that the correct areas are visited is essential for a cost-effective inventory, underscoring the importance of accurate model predictions. New technical solutions could assist in creating even better models.

In recent years drones have emerged as a mature and versatile tool for data collection. Paired with high-resolution cameras high-quality orthophotos can be created. Such data combined with advanced deep neural network algorithms and field data ground truthing can be used to accurately model field layer coverage via semantic segmentation. A sparsely annotated approach is being used to segment vegetation at a local level. Once data is sufficient, a general model will be developed with the aim of delivering a robust model for reliable use by stakeholders.

AOS Poster 21

Rapid Detection of Panarctic Permafrost Region Disturbances with Remote Sensing and Deep Learning

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The Arctic climate is changing rapidly with a profound impact on the stability of permafrost. Rapid permafrost thaw often occurs in the form of disturbances, such as retrogressive thaw slumps (RTS) or widespread lake changes e.g. as shoreline erosion or drainage.

We developed a workflow for detecting and quantifying panarctic retrogressive thaw slumps and lake drainage events at high spatial and temporal resolution using satellite-based imagery and datasets. For the multi-year database of AI-detected retrogressive thaw slumps (DARTS), we developed a highly automated deep-learning based analysis and dataset to track the formation and evolution of RTS across the circum-arctic permafrost region. Furthermore, we created a near real-time lake change detection analysis, which will be launched in summer 2026. First tests during summer 2025 showed promising results confirming many lake drainage events across the arctic.

Our tools, datasets, and analyses will help to better understand the impact of the changing climate on permafrost and to better project future changes. Near-real time detection of permafrost disturbances in the Arctic will also be useful for land managers, communities, industry, and other stakeholders interested in permafrost stability and in developing mitigation strategies for impacts of permafrost thaw events or loss of freshwater resources.

AOS Poster 22

From uncrewed aerial vehicles to a helicopter-borne measurement system: Airborne platforms for studying atmospheric interactions in polar regions

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The investigation of the Arctic climate system and the enhanced understanding of Arctic processes need precise in situ observations, especially of meteorological properties, aerosols, trace gases (e.g. methane), radiation and surface properties in the atmospheric boundary layer (ABL). These measurements are crucial to improve and validate models.

Since decades, TU Braunschweig performs airborne measurements in the polar regions using different uncrewed aerial vehicles (UAVs) and the helicopter-borne measurement system HELiPOD. UAV measurements, using multi-copters or fixed-wings, were implemented for example in Antarctica (2013), at Fram Strait on Polarstern (2017), Ny-Alesund (2018, 2024) and finish Lapland (2025). The focus of these measurements is e.g. the ABL in connection with aerosols and new particle formation events. Since 2012, HELiPOD was deployed in several field campaigns in the Arctic, for instance in Siberia (2012), from Polarstern during MOSAiC (2020) and from the Swedish ice breaker Oden during ArtOfMelt (2023).

The operation of airborne platforms poses significant challenges such as, for example, high wind speeds and extremely low ambient temperatures, which can lead to icing on wings or rotors of the UAVs. This presentation aims to introduce the measurement devices, and their capabilities for observations of high-resolution data in the polar regions.

AOS Poster 23

Resilient Hydrogen Storage for the Arctic Through On-Site Additive Manufacturing

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Hydrogen-based energy systems are increasingly considered for Arctic maritime decarbonisation, yet deployment is constrained by extreme cold, remoteness, and limited manufacturing and logistics infrastructure. This paper presents a conceptual approach to

hydrogen storage and transportation based on on-site additive manufacturing of large-scale storage tanks using fiber-reinforced thermoset polymer composites. Large-scale 3D printing enables localized production near ports or shipyards, reducing dependence on long and vulnerable supply chains, lowering transport-related emissions, and enabling on-demand fabrication and repair in Arctic environments. Fiber-reinforced thermoset composites offer high specific strength, chemical resistance, low permeability, and promising performance under sub-zero conditions, making them attractive for safe hydrogen containment in cold regions. The approach further allows design flexibility in tank geometry and integration with maritime and cold-climate operational requirements. This contribution focuses on Arctic maritime relevance, material rationale, and preliminary design considerations. While experimental validation and life-cycle assessment are ongoing, the work establishes a foundation for resilient hydrogen infrastructure tailored to Arctic maritime applications.

AOS Poster 24

Perma-X Airborne Observations for Permafrost and Coastal Studies

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Within the Perma-X airborne campaigns conducted by AWI in collaboration with regional and local partners in Alaska and NW Canada since 2019, extensive imagery and lidar datasets are collected across Arctic and Subarctic permafrost regions in North America. The Perma-X main objective is to investigate the processes underlying permafrost thaw in the Inuvialuit and Gwich'in settlement regions of Northwestern Canada and the Inupiaq region in North and Northwest Alaska. Permafrost thaw has immense impacts on local infrastructure and communities, coastal stability, contaminant mobilization, biogeochemistry, ecosystems and the Earth's climate.

Perma-X addresses knowledge gaps associated with permafrost degradation across highly dynamic inland and coastal landscapes by acquiring very-high-resolution imagery and terrain elevation information AWI's Polar-5 and Polar-6 research airplanes equipped with the Modular

Aerial Camera System (MACS) with RGB, NIR, and TIR cameras, and various Riegl laser scanners.

Targeted disturbance dynamics include thermokarst lake expansion and drainage, retrogressive thaw slumping, forest and tundra burn scars, ice wedge degradation, thaw subsidence, coastal erosion, vegetation shifts, driftwood accumulations, and thaw-driven vulnerabilities to local infrastructure. We will present results from the ongoing data collection and discuss future directions for open data access and plans for extensive new surveys within the REVISIT campaign in 2027.

AOS Poster 25

The Canadian Arctic-Subarctic Biogeoclimatic Ecosystem Classification System (CASBEC): A Useful Tool for Designing Long-Term Monitoring in Tundra Ecosystems

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The CASBEC system (McLennan et al, 2019) is being used to classify and map tundra ecosystems at a range of scales in the western Canadian Arctic on Victoria Island, Nunavut. The CASBEC system applies vegetation and ecosystem classification approaches developed and widely applied In British Columbia (BC BEC, MacKenzie and Meidinger, 2017). BEC approaches are based on a century of ecosystem science, with deep roots in Europe (Pogrebnyak, 1930, 1955; Braun-Blanquet, 1932; 1951, 1964; Vorobyov, 1953; Sukachev, 1960; Sukachev and Dylis, 1964) and North America (Clements, 1916, 1936; Jenny, 1941; Major, 1951). As a result of its internal structure, CASBEC provides an excellent tool for designing terrestrial ecosystem monitoring programs (McLennan et al, 2018). Developing a CASBEC classification requires the complete enumeration of all vascular and non-vascular species (α diversity), with maps of community distributions quantifying β diversity. CASBEC ecosystem units capture changes in the distributions of tundra ecosystems along landscape hygrotopes, edatopes and snow protection gradients, and thus provide a method for tracking change for a broad range of specific monitoring questions. Finally, CASBEC maps can be used to extrapolate local monitoring results to the wider landscape based on ecological models linked to remote sensing tools.

AOS Poster 26

Navigating Actionable Science in the Arctic: Addressing the Training Gap

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The call by management agencies and funding partners for proposals which create actionable science—science that can be directly applied to achieve specific goals—has been growing over past decades. Adoption of actionable science methods has been slow due to limited opportunities and time to engage in training in these new methods - particularly for mid- and late-career researchers. Here we will discuss an approach to addressing this training gap in the context of Arctic research through the development of a Massive Open Online Course (or MOOC) “Navigating Actionable Science in the Arctic”.

The course, now available through the EdX platform, walks researchers new to actionable science through the lifecycle of a research project from context and inputs to implementation and finally design outcomes, with guidance on how the method differs from traditional research methods. It covers current literature on convergence, co-production of knowledge, impactful science, boundary spanning, and engaged research. Experts in the field Timm and Rudolf provide overviews, context, and discussions in short videos. Capturing the challenges of putting theory to practice, interviews with practitioners are utilized throughout the course. These contributions come from non-academic partners who have firsthand experience with both governmental land and resource management entities and Indigenous organizations at the local and regional scale.

AOS Poster 27

The New GTN-P Data Platform: Global Long-Term Permafrost Observations

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The Global Terrestrial Network for Permafrost (GTN-P, https://www.gtn-p.org) is the primary international program for long-term permafrost monitoring. It coordinates a global network that provides consistent, high-quality data on the state and evolution of permafrost. As part of international climate observing frameworks, GTN-P contributes to monitoring permafrost as an Essential Climate Variable (ECV) through standardized measurements of permafrost temperature (PT) and active layer thickness (ALT). Its database integrates observations from over thirty countries, supporting assessments of environmental change and related impacts.

In January 2026, GTN-P launched a new Data Platform (https://data.gtn-p.org) that improves data accessibility, usability, and quality control. Users can explore and visualize standardized datasets, while streamlined submission workflows and automated validation enhance consistency. The platform is built on a scalable infrastructure with persistent identifiers and a public API, supporting interoperability and long-term data stewardship.

Expanding the spatial and temporal coverage of observations remains a key priority, requiring the integration of additional existing and newly acquired datasets. The new platform provides a timely opportunity to strengthen data contributions, improve representation across regions, and increase the visibility of available data. Sustained operational support will be essential to ensure continuity, enable ongoing development, and maximize the long-term value of permafrost observations.