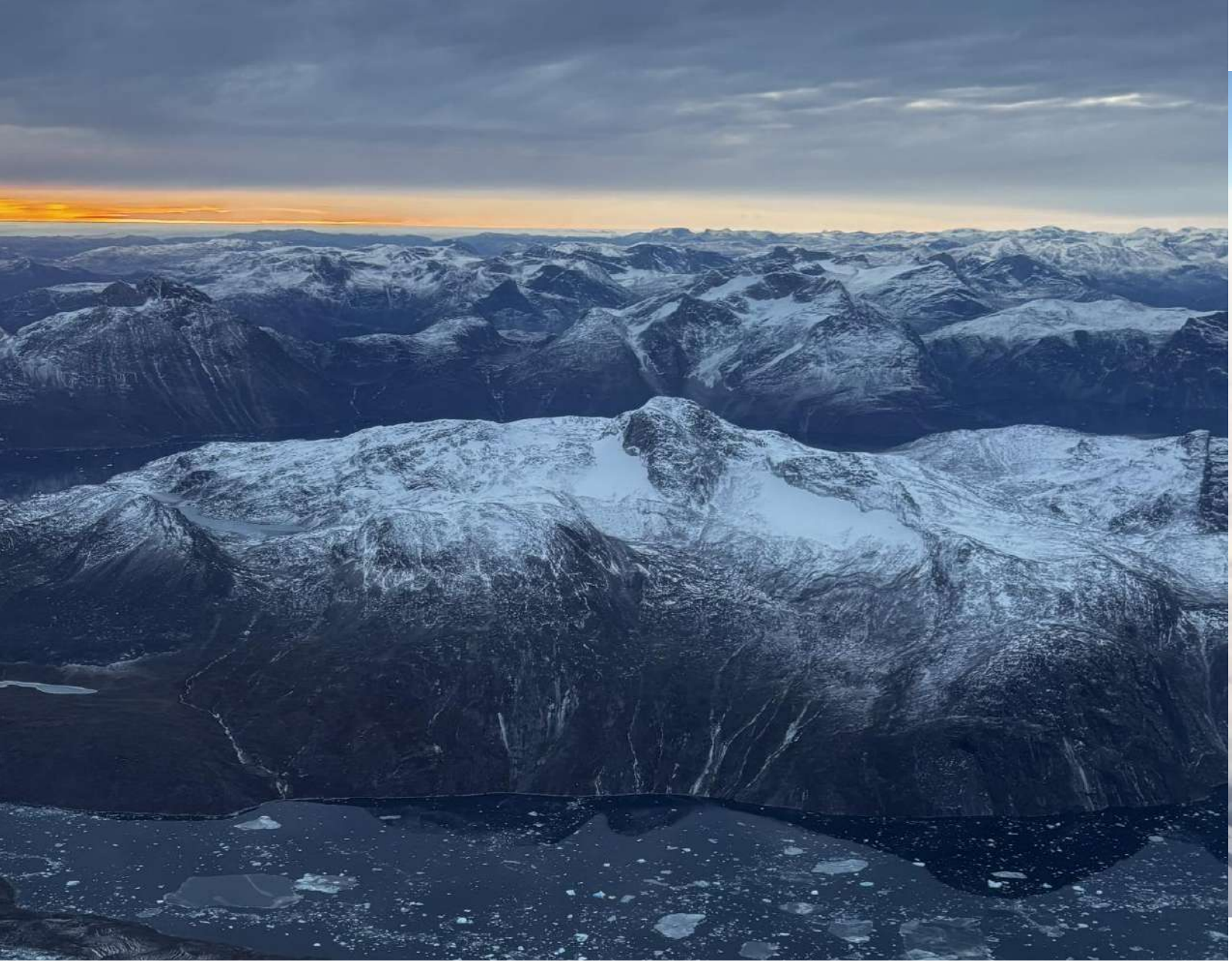

Arctic Observing Summit 2026 Report

Arctic Science Summit Week

Aarhus, Denmark

March 30 – April 1, 2026

SAON
SUSTAINING ARCTIC OBSERVING NETWORKS

ARCTIC OBSERVING SUMMIT
AOS

IASC International Arctic Science Committee

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Vanessa Raymond	University of Alaska Fairbanks
Victoria Qutuuq Buschman	ICC

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John Smelter
Jus Tavcar
Axel Schlindwein
Hannah Mode
Dane Malenfant
Joonas Kolstela
Emily Lescak

https://arcticobservingsummit.org

2026 AOS Program is available at:

Bradley, A., Arctic Observing Summit Organizing Committee, Sustaining Arctic Observing Networks, & International Arctic Science Committee. (2026). Arctic Observing Summit 2026 Program. Arctic Observing Summit (AOS), Aarhus, Denmark. https://doi.org/10.5281/zenodo.19335758

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Cover photos: Chantelle Verhey (front, near Nuuk, Greenland), Alice Bradley (back, Utqiagvik, Alaska)

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Opening plenary

Speakers

Victoria Qutuuq Bushman, Inuit Circumpolar Council, Greenland

Gunn-Britt Retter, Saami Council

Charleen Fisher, University of Alaska Fairbanks

Sascha Schiøtt, Greenland Institute of Natural Resources

Summary

Victoria Qutuuq Bushman and Gunn-Britt Retter started the plenary panel with a skit talking through the "silly questions" often asked of Indigenous individuals in spaces like the Arctic Observing Summit. By addressing the sometimes inappropriate or misguided questions in a lighthearted setting, they set the tone for the session and for the summit.

The session continued with a panel discussion moderated by Victoria, featuring Gunn-Britt, Charleen Fisher, and Sascha Schiøtt. Gunn-Britt talked about how Indigenous Knowledge protects the lands and waters of her home, giving an example of how the community in her fjord adapted to an invasive crab species. Charleen discussed the role of language, and how much information is held in the terminology. She talked about "Indigenizing" as opposed to "de-colonizing" as a means of bringing the strengths of Gwich'in approaches and worldviews into her work and life. Sascha shared her experience working with hunters and fishers as research partners and the depth of knowledge they hold. The conversation circled back to language and how much knowledge can only be conveyed in its full nuance in the local language. The panel considered what makes an effective and welcoming meeting space for the co-production of knowledge and the discussion of Indigenous Knowledge in the context of research and western science: time together, mutual respect, and understanding.

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

Session summary:

This session explored how Arctic observing systems—and the metrics used to evaluate their success—might change if gender, Indigenous self-governance, and intersectional perspectives were treated as foundational rather than additive. Framing presentations by Embla Oddsdottir and Tahnee Prior highlighted existing policy commitments to mainstream gender-based analysis, persistent data gaps, and examples demonstrating how gender-disaggregated and community-informed approaches can reveal risks and outcomes that would otherwise remain invisible. Participants were also invited to reflect on their own roles and responsibilities, emphasizing that individuals engage with environmental data in multiple, overlapping contexts beyond professional identities.

Across breakout discussions and report-backs, participants identified a consistent tension between the comprehensive structure of existing objective-based frameworks, such as the International Arctic Observing Assessment Framework (IAOAF), and their ability to capture lived experience. While objective-based approaches provide important metrics, participants noted that key dimensions of risk, exposure, and societal benefit—particularly those shaped by gender, culture, and the local context—often only emerge in complex, real-world scenarios where multiple objectives interact. Concepts such as "well-being" and "resilience" were recognized as context-dependent and shaped by diverse worldviews, underscoring the need for more flexible and participatory approaches to defining success.

Participants further emphasized that frameworks like the IAOAF are shaped by upstream policy environments, and that gaps in policy—particularly related to gender and Indigenous governance—can propagate into assessment tools and practices. At the same time, effective application of these frameworks depends on inclusive, reflexive, and context-sensitive practices, including the use of concrete examples, diverse perspectives in decision-making, and approaches that allow individuals and communities to see their experiences reflected in both processes and outputs. Participants also noted that engaging with gender and other identity dimensions can be sensitive in some contexts, requiring careful, ethical, and locally appropriate approaches.

Overall, the session highlighted the value of societal benefit metrics while identifying opportunities to strengthen their relevance through more integrated, scenario-based, and participatory approaches. These insights will inform ongoing work through the Women of the Arctic project highlighted in the

session and contribute to broader efforts within AOS and SAON to advance more inclusive and context-aware Arctic observing systems.

Recommendations:

Complement objective-based frameworks with scenario-based approaches to reveal complexity

Who:
Practitioners applying Arctic observing frameworks like the IAOAF, including facilitators and Expert Panel leads within the SAON ROADS process, as well as contributors to related assessment activities.

How:

- Integrate scenario-based methods alongside objective-based assessments; use scenarios (e.g., wildfire exposure, food security, infrastructure disruptions) to examine how multiple objectives interact in practice
- Engage practitioners with experience in participatory scenario planning, co-design, and user-centered approaches within communities of practice on measuring success
- Include structured reflection on key terms (e.g., "well-being," "resilience") to explore how their meaning varies across contexts, identities, and knowledge systems

When:
Immediately actionable within ongoing ROADS Expert Panel activities; additionally, introduce scenario-based approaches into future AOS sessions and consider dedicated learning exchanges or guidance through the ROADS Advisory Panel.

Why:
Participants consistently identified that key dimensions of risk, exposure, and societal benefit—particularly those related to gender, Indigenous knowledge systems, and lived experience—only become visible when multiple objectives interact in real-world contexts. While objective-based frameworks provide important structure, they may not surface these interactions on their own. Scenario-based approaches help reveal how observing systems are actually used, expose gaps that remain hidden in isolated objectives, and support more equitable and context-relevant assessments of success. Participants also noted that commonly used terms such as "well-being" and "resilience" are not universally defined, but are shaped by cultural, social, and gendered contexts. Scenario or use case based approaches are more likely to surface these diverse interpretations.

Recognize and strengthen the relationship between policy frameworks and observing system design

Who:
Policy-makers across scales (international, national, regional, municipal, and community), as well as organizations that develop and apply observing frameworks (e.g., SAON, ROADS Expert Panels), with attention to increasing the visibility of gender, Indigenous lifeways and governance, and their intersections.

How:

- Incorporate gender, Indigenous lifeways and governance, and intersectional dimensions more explicitly within policy documents that inform observing priorities (e.g., national Arctic strategies and related frameworks)
- Conduct broader, multi-scale policy scans that extend beyond national strategies to include regional, municipal, and community-level priorities and governance structures
- Engage in inclusive public input processes to ensure that diverse lived experiences and knowledge systems are reflected in policy development
- Encourage Expert Panels and assessment teams to explicitly examine how policy inputs shape framework design and application, including identifying where key dimensions are absent or underrepresented
- Foster dialogue between policy-makers and observing system practitioners to better align policy priorities, framework design, and lived realities

When:
During the development and revision of policy documents and observing frameworks, and as part of ongoing ROADS Expert Panel activities and assessments.

Why:
Participants highlighted that observing frameworks are shaped by the policy environments from which they are derived. When policy documents do not make gender, Indigenous lifeways, and related dimensions visible, these gaps can propagate into observing frameworks and associated tools, such as the IAOAF, influencing how priorities are defined and how success is measured. Strengthening the visibility of these dimensions within policy—and recognizing their downstream impacts—can help ensure that observing systems are better aligned with place-based contexts and more capable of delivering equitable societal benefits.

Strengthen reflexive and participatory practices in the application of observing frameworks

Who:
Practitioners applying Arctic observing and assessment frameworks, particularly facilitators of ROADS Expert Panels, as well as research teams and organizations (e.g., US AON and others) engaged in evaluating observing system benefits, gaps, and performance.

How:

Integrate reflexive and participatory approaches (e.g., co-design, co-production of knowledge (CPK), community-based participatory research, and other grounded and decolonizing methodologies) into Expert Panel activities and assessment workflows

Engage social scientists and practitioners with expertise in these methods as core contributors to Expert Panels and evaluation teams, alongside technical domain experts

Incorporate structured reflection exercises that examine how key concepts (e.g., “well-being,” “resilience”) are defined, by whom, and with what implications

Apply context-sensitive approaches when engaging with gender and other identity dimensions, recognizing that these topics may be experienced as sensitive and may carry risks depending on cultural, political, or community contexts

Consider the ethical implications of data disaggregation, including privacy, potential misuse, and community concerns about access and application

Develop supporting infrastructure, such as training modules, guidance materials within the ROADS Handbook, and potential early-career fellowship opportunities to build capacity in these approaches

When:
Immediately actionable within ongoing ROADS Expert Panel activities and related assessment efforts; further developed through AOS and SAON capacity-building initiatives and future training programs.

Why:
Participants emphasized that frameworks alone do not ensure inclusive or context-relevant outcomes. Without intentional, reflexive, and participatory practices, key dimensions of lived experience—including those related to gender, Indigenous knowledge systems, and local context—may remain invisible or be filtered through dominant perspectives. Strengthening the use of grounded and inclusive methodologies enables practitioners to surface these dimensions, interpret frameworks more effectively in context, and produce more equitable and actionable assessments of societal benefit.

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
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Lauren Divine, Aleut International Associationldivineberry@gmail.com

Session summary:

This session series explored how the Arctic ROADS process can serve as an implementation-oriented pathway for advancing ICARP IV recommendations and preparing for IPY5-scale collaboration. Through keynote reflections, panel discussions, and interactive workshops, participants considered both the strategic opportunities and practical challenges involved in sustaining inclusive Arctic observing systems over long time horizons. Discussions emphasized that many lessons from IPY 2007–2009 remain highly relevant today, including the importance of long-term coordination, infrastructure continuity, data accessibility, partnership building, and sustained support for community-based observing.

A recurring theme across all sessions was that ROADS is emerging not only as a planning framework, but also as a community of practice capable of linking local, regional, and international observing efforts. Participants emphasized that successful implementation will require stronger support for Indigenous organizations, community leadership, early career engagement, planning grants, and sustained coordination capacity. The sessions highlighted the need for ROADS to remain flexible and accessible while maintaining transparent processes that can support implementation, foster trust, and align observing investments with societal priorities. Participants also stressed that IPY5 presents a major opportunity to embed ROADS principles into future observing initiatives, funding calls, and collaborative structures.

Session 1: Readiness for Collaboration — How ROADS Can Enable IPY-Scale Action

This session examined how ROADS can support implementation-oriented collaboration in the lead-up to IPY5 by drawing lessons from the legacy of IPY 2007–2009 and the recommendations emerging from ICARP IV. Keynote reflections by David Hik traced the historical development of Arctic observing coordination efforts and emphasized that sustaining observing systems requires long-term partnerships, shared infrastructure, and meaningful societal value propositions.

Margaret Rudolf highlighted ICARP IV's emphasis on legitimacy, transparency, equity, and broad participation in observing and data planning processes.

The panel discussion brought together representatives from funding organizations, Indigenous organizations, national IPY committees, and international coordinating bodies. Participants discussed the need for planning grants, coordination mechanisms, and stronger Indigenous capacity within IPY-related activities. Several speakers emphasized that ROADS will only succeed if it visibly supports Indigenous sovereignty, equitable participation, and community-defined priorities. Others noted that ROADS offers value because it provides a transparent process for identifying shared societal benefits and coordinating across scales and sectors. Discussions also recognized that ROADS can appear complex, but that its phased structure helps organize collaborative planning and can become more accessible through facilitation, communication, and implementation-focused support.

Recommendations:

Recognize ROADS within IPY structures and funding programmes

Who: IPY Coordination Office and National IPY Committees in cooperation with SAON Board, Funders and funding coordination bodies

What: Recognize ROADS within IPY structures (e.g. Task Group on IPY Priorities and Visions) and funding program calls (e.g. Belmont Forum, Arctic Science Funders Forum, European Commission)

When: Within 2 years to be effective in the IPY (planning grants identified immediately)

How: Cross-organizational dialogs, including through Beyond Arctic PASSION ROADS workshops and via the Sustaining Arctic Observing Networks (SAON) Board regular meetings

Why: ROADS has been developed by SAON to generate high-quality, transparent and well-partnered observing strategies around topics that require integrated approaches. This recommendation would generate visibility around the ROADS process to serve as an integral part of the preparation and implementation of 5th IPY for well-aligned projects and efforts.

Identify planning grant vehicles

Who: ROADS Advisory Panel and the SAON Board

What: Identify planning grant vehicles (e.g. Polar Knowledge Canada, ArcticNet) that 'fit' ROADS; generate a living resource list for Expert Panels on roadsadvisorypanel.org

When: Summer and fall of 2026

How: Place a request before the SAON Board and ROADS Advisory Panel to compile a list of national vehicles; reach out to Arctic Funders Collaborative

Why: It is recognized that completing the ROADS process requires a level of effort consistent with planning grants. ROADS Expert Panels will be driven forward by planning grants that are well aligned with the executing the ROADS process. Developing a ready resource will enable their advancement.

Make the ROADS process visible and accessible

Who: ROADS Advisory Panel, Expert Panel (EP) facilitators, and emerging EP concepts, Association of Polar Early Career Scientists (APECS)

What: Make the ROADS process visible and accessible to broader audiences and Indigenous-centered convenings

When: Continuously (starting with ArcticNet 2026)

How: Host sessions and facilitate conversations at different venues, continue to develop communications and engagement materials

Why: Broader engagement in the ROADS process will facilitate uptake of its outcomes and result in enhanced opportunities for funding. Increasing the visibility of the ROADS process and sharing learnings from the Expert Panels will support the inclusion of its Guiding Principles across the research community.

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

Chairs:

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Natasha Haycock-Chavez, University of Colorado Boulder, naha6486@colorado.edu
Emily Lescak, IARC, RNACoobs, elescak@alaska.edu
Zoé Brasseur, SIOS, zoe.brasseur@sios-svalbard.org
Lauren Divine, ldivineberry@gmail.com

Session summary:

This highly interactive session focused on what capacities, relationships, and governance approaches are needed for ROADS to genuinely support Indigenous-led and community-based observing. Participants explored visions for community hubs, success metrics, workforce development, data sovereignty, and equitable participation through facilitated world café discussions.

A central insight from the session was that inclusion cannot be treated as a secondary outcome of observing system design, but must instead shape the structure, governance, implementation, and evaluation of the ROADS process itself. Participants emphasized that success metrics should reflect community-defined values and incorporate Indigenous methodologies, stories, narrative feedbacks, and culturally responsive evaluation approaches rather than relying exclusively on quantitative indicators. Discussions also highlighted the importance of translation, interpretation, reciprocal knowledge exchange, long-term funding, coordination support, youth engagement, and Indigenous data sovereignty.

The session further emphasized that ROADS implementation depends upon sustained community capacities, including Indigenous Guardians and Sentinels programs, regional hubs, and workforce development pathways that support long-term participation and leadership. Participants noted that the process must account for existing power dynamics, unequal institutional capacities, and the logistical realities of Arctic communities if it is to foster durable and equitable partnerships.

Recommendations:

Develop training programmes on the ROADS process

Who: APECS and ROADS Advisory Panel
What: Advance dialogue on a training program to support engagement in on the ROADS process and initiate the distributed implementation of its guiding principles across the Arctic research community
When: Fall-Winter 2026
How: Dialogue on scope and potential avenues for implementation between the APECS International Directorate, the ROADS Advisory Panel, and early career individuals currently involved in the ROADS process
Why: Strengthened engagement capacity

Develop success metrics for ROADS

Who: ROADS Advisory Panel
What: Develop evaluation metrics on the process of ROADS EP, focused on equity and inclusion. This would include focusing on different perspectives, values, and governance of the EPs. It should also support broadening the definition of success and pushing evaluation forward by utilizing Indigenous methodologies, stories, and narrative feedbacks, as well as capturing current use of existing SAVs data.
When: Fall-Winter 2026
How: Dialogue within the AP around evaluation. Bringing in evaluation expertise to learn from, including training on Indigenous and culturally-responsive evaluation. Iterate on how to give constructive and useful feedback to the EPs.
Why: Support collaboration and partnership between scientists and Arctic Indigenous communities
Additional details: Once success metrics have been developed for the ROADS process by the AP, the SAON Board should prioritize supporting collaboration and partnership between scientists and Arctic Indigenous communities.

ROADS Handbook recognizes and advocates for workforce development and community-led capacities (e.g. hubs, Indigenous Guardians/ Sentinels programs, youth and early career development opportunities) as foundational to effective ROADS process engagement and SAV Implementation

Who: Advisory Panel (documentation team), ROADS Expert Panels, funders

What: Recognize the effectiveness and importance of workforce development, youth engagement, and investment in multi-purpose community hubs as implementation vehicles for Shared Arctic Variables. Community hub and/or Indigenous Guardians/Sentinels models could also support engagement and fulfilment of the ROADS process with strong community leadership.
When: Summer 2026
How: Complete writing sessions through summer 2026 with these concepts fully included in ways that increase visibility of existing examples; make community models more accessible to larger audiences
Why: To realize the Guiding Principles of the ROADS process, strong mechanisms for community-led engagement and implementation need to be made explicit in the Handbook. The ROADS Handbook

should focus on the Expert Panel Implementation Strategies that support multipurpose hubs as one vehicle for effective advocacy.
Additional details: Conceptual and language translation of materials was discussed at length in various groups. Both of these types of translation activities need to be supported within each step of the ROADS process for effective engagement and implementation.

Center community values and needs throughout all stages of the ROADS process

Who: ROADS Advisory Panel (and documentation team), ROADS Expert Panels (especially facilitators), researchers using the ROADS process
What: Ensure that Indigenous and local community values, priorities, and definitions of success are centered throughout all stages of the ROADS process, from planning and governance to implementation and evaluation. Address the question: How will (and does) the ROADS process support meeting Arctic community needs? Prioritize focus on implementation and supporting Community Hubs in regard to infrastructure and capacity.
When: Summer thru Winter 2026
How: Directly engage in existing Community Hubs, Indigenous organizations, and local leadership structures within the AP and EPs to co-develop a process that supports them. Include Indigenous evaluation approaches and culturally responsive facilitation. Address power dynamics, including who identifies the info gaps, evaluates societal impacts, develops data sharing protocols and whether data sovereignty is implemented, and is funded to participate and whether they are well-resourced. Consider where meetings are held and who is most comfortable in those settings, and whether the meetings can happen within communities.
Why: To ensure the ROADS process is responsive to community-defined priorities and support equitable and long-term partnerships. Arctic Indigenous communities are part of the Arctic research community, but often underfunded and without capacity to fully participate nor take advantage of the research happening on their lands.
Additional details: Provide translation and interpretation support within AP, EP, and related meetings (such as at AOS). Providing networking opportunities to relevant scientific expertise as well as to funders. Not everything needs to be pan-Arctic to have broadly shared benefit.

ROADS: Fostering Present and Future Expert Panels

Chairs:

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Lauren Divine, ldivineberry@gmail.com

Session Summary:

This session brought together current and emerging ROADS Expert Panels to reflect on lessons learned and explore future opportunities for engagement. Existing panels on salmon, harmful algal blooms, wildfire, and sea ice shared experiences related to trust-building, community engagement, funding, facilitation, and implementation. Participants repeatedly emphasized that successful Expert Panels require substantial relationship-building and flexible facilitation approaches that adapt to community contexts and priorities rather than imposing rigid structures.

Discussions revealed that many Expert Panels operate iteratively across ROADS phases rather than progressing linearly, and that facilitators often play critical “translation” roles between community priorities, scientific frameworks, and implementation requirements. Participants stressed the importance of grounding observing priorities in clearly articulated societal needs and benefits, particularly where observations support adaptation, food security, safety, environmental stewardship, and operational decision-making. The session also highlighted the importance of maintaining broad participation while preventing process fatigue and overburdening community contributors.

Interactive breakout discussions generated strong interest in future ROADS Expert Panels related to marine debris, terrain trafficability, marine mammals, fjords, coastal erosion, and regional salmon systems. Participants also identified opportunities to better integrate ROADS with Arctic Data Committee and Committee on Networks activities, including Polar Data Hackathons and observing asset inventories. Across discussions, participants emphasized that ROADS is increasingly functioning as both a practical planning framework and a broader collaborative practice for connecting communities, researchers, operational agencies, and funders around shared Arctic observing challenges.

Recommendations:

Engage in Polar Data Hackathons

Who: Polar Data Forum, ROADS AP and EP leads (starting with sea ice) via their Community of Practice dialogues
What: Engage the ROADS community in the Polar Data Hackathon process. Encourage the participation of EP members as concrete options emerge. Share sea ice EP experiences post-Hackathon with the EP Community of Practice.
When: Sea ice EP already planning (other groups based on readiness as soon as data conversation is engaged)
How: Start a dialog and planning process, connecting EP leads with PDH organisers.
Why: Unlock the data community's capabilities for use in the ROADS process. Include the observing assets (POAwg).

Create Greater Cross-Visibility of Arctic Data Committee and CON tools and capacities within the ROADS process

Who: ADC & CON, Polar Data Forum, ROADS AP and documentation task team
What: Create visibility within the ROADS process for Arctic Data Committee (ADC) and Committee of Networks (CON) tools and capacities like the Polar Data Hackathons (PDH) and Polar Observing Asset Working Group (POAwg)
When: Starting summer 2026 the ROADS writing team can create more “sidebar” content about the PDF, POAwg, POLDER Working Group (Polar Data Stewardship and Federated Search, and Data Planning Toolkit (ADC/ELOKA)
How: Dialog between writing team and relevant groups
Why: Unlock the data community's capabilities for use in the ROADS process. Include the observing assets (POAwg). Also create more visibility of ROADS within these activities.

Facilitate the initiation of an early career-led marine debris Expert Panel

Who: Arctic Council Working Groups, ROADS Advisory Panel
What: Support a facilitation team in:

- Preparing an engagement session at the Arctic Youth Conference
- Gauging interest and recruiting Expert Panel members led by Indigenous youth and early career professionals
- Support a scoping process, through funding a team of facilitators, for a pan-Arctic EP on marine debris

When: Now, leading up to the Arctic Youth Conference 2027
How: Host initial in-person conversations at AYC 2027. Explore funding opportunities to support EP work.
Why: Coordinated observations on marine debris are needed to inform policy development across governance levels.

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

Convenors:

Chris Waigl and Margaret Rudolf (UAF/IARC)
Contact person: Chris Waigl - cwaigl@alaska.edu

Session summary:

The session was designed as a space for practitioners engaged in leading Expert Panels (EPs) under SAON/ROADS to convene a conversation with the aim to uncover key prerequisites, requirements and constraints of work that takes place under SAON/ROADS or comparable paradigms, engaging place-relevant co-production of knowledge and elevating Indigenous voices in Arctic observing. It was organized as a "fishbowl" style, consisting of three circles:

- Inner circle: Margaret Rudolf (facilitator), Jamie O'Connor (salmon EP), Lauren Divine (Harmful Algal Blooms (HABs) EP Alaska), Talia Wells (sea ice EP), and Chris Waigl (wildfire EP North America)
- Middle circle: ~10 participants also associated with active EPs, SAON/ROADS, or co-production in Arctic observing
- Outer circle: ~15 additional participants interested in learning more about the practical side of EP work

Including Tav Ammu (HABs EP), Harmony Wayner (formerly salmon EP), Katriina Veijola (wildfire EP Europe) and Alex Meyer (Permafrost EP) seated in the middle circle, all currently active EPs were represented, as were the ROADS Advisory Board, and both NSF RNA CoObs and Arctic Passion. The conversation was guided by four questions, designed to focus on reflection and narrative accounts of the EP work:

1. What do you hope to achieve in this work?
2. What elements do you consider most important for being successful in this work?
3. What frameworks or protocols are central to this work for you?
4. Do you have a story or example for how something an EP participant contributed gave you a key insight for how the ROADS protocol applies to your thematic area?

A point of consensus was the need to embrace the intentional, slow nature of the EP process, to start with building relationships and trust, and to co-produce the evaluation criteria, role distribution, and even potentially the societal benefits framework an EP chooses to use. Both the ROADS four-phase structure and the concept of Shared Arctic Variables were cited as playing a dual role, lending both structural support to the process and generating points of friction. On one hand, ROADS phases offer guiding principles and SAVs connect the panel's work outcomes to scientific observables and Arctic observing systems as well as pan-Arctic interests. On the other hand, Indigenous experts and other non-academic panelists frequently perceive little added value in the work required to maintain and align with this infrastructure, but instead prioritize action, policy outcomes, and workforce and educational

development opportunities. The updated ROADS Practitioner's Handbook, Workbook and Glossary was welcomed by EP leads as helpful to their role as translators between the diverse aims of contributors.

EP leads value spaces for shared experience and strategizing while recognizing that different EP's political environments, engagement structures, funding contexts, and leaders' positionality mean that each EP follows its own path toward equitable participation. Another source of satisfaction can be discovering that sustained long-term work pays off unexpectedly when it meets the needs at hand.

Who	What	When	How	Why
EP leads	Embrace translator & boundary spanner role	Throughout the process	Get help / training when necessary. Lean on existing boundary spanners and potential partners	EP leads will need to take on bureaucratic parts of work. and lean on a chain of boundary spanners throughout the expert space. Leverage opportunities to add value for panelists
EP leads	Embrace work cycles and work processes that fit the specific EP's context	Starting after the earliest exploratory stage	Align work cycles with cycles of subsistence activities; opportunistic convening	Related to the boundary spanner role, this removes friction and obstacles to consultation and engagement and fosters trust
EP leads, ROADS advisory board, projects that support EPs (such as CoObs, Arctic Passion)	Seek opportunities for exchange of experience and strategies between EPs	All active and concluded EPs viz. follow-up projects	EPs define their own organizational structure co-produce select parts of the process	Different EPs work in thematic environments with different levels of political urgency and pitfalls, existing engagement with research or level of unmet observing needs.
IASC, ROADS advisory board	help open up long-term, independent funding streams	As current pilot projects (like RNA CoObs and ArcticPASSION) begin to transition toward long-	Advocacy work and networking with potential funders	The funding opportunities for EPs remain scarce, funding needs to be ensured over multiple years, and EPs frequently require multiple attempts or lean on multiple projects. Funding should be a buffer against political

		term maintenance		vagaries inherent in EP themes
ROADS advisory board, projects that support EPs (such as CoObs, Arctic Passion)	Develop co-benefits between ROADS and interests of participant groups	As projects move towards implementation and tangible products	ROADS could play the matchmaker role between scientists / communities / observing agencies	Think about the future of ROADS once lessons from EPs coalesce and networks start strengthening. Transformative role
ROADS advisory board and EP leads	Continue integrating EP feedback into ROADs documentation and process	Continually	Produce ever more praxis oriented documentation, spaces for exchange, flexibility, and feedback	EPs will diverge from the set process when it makes sense, and will make decisions about which parts to co-produce. The lessons should be captured as they provide insights and future guidance.

Relevant resources:

ROADS Practitioner's Handbook, Workbook and Glossary
https://zenodo.org/records/19186391?preview_file=ROADS+Handbook+Part+I.pdf

Our thanks to the notetakers: Axel Schlindwein (official), Emily Lescak & Tricia Hutton (unofficial)

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/Western Norway Research Institute
alexandra.meyer@univie.ac.at

Background:

The Shared Arctic Variables (SAVs) emerged from the Arctic Observing Summit 2020 and the Sustaining Arctic Observing Networks (SAON)'s initiative Arctic Roadmap for Observing and Data Systems (ROADS). The SAVs are an attempt at defining "sets of observables that can help to solve problems on a local or regional scale in the Arctic" (https://arcticpassion.eu/blog/SharedArcticVariables). Similar to the WMO's Essential Variables (EVs) used in global monitoring systems, SAVs are intended to coordinate observations across phenomena of interest to multiple sectors. Yet, the Shared Arctic Variables should be shared, hence be co-designed in a collaborative sense: they aim to facilitate the exchange of knowledge, identify gaps and priorities from multiple perspectives, and ultimately respond to the needs of the communities they are meant to serve. Work on the permafrost SAV was further advanced through the Arctic CoObs RNA (US) and the Arctic Passion project (EU), in which the Svalbard Integrated Arctic Earth Observing System (SIOS) took a leading role by convening a permafrost SAV expert panel. The two permafrost SAV sessions at the AOS 2026 were convened by members of the permafrost SAV expert panel. Their aim was to share the group's ongoing work with the broader permafrost and Arctic community, and to discuss how to move the process forward.

Session summary:

The session was organized in two parts: during the morning, invited speakers delivered short presentations, sharing their work and offering input on the permafrost SAV process. The afternoon session took a more workshop-oriented format, focusing on collaborative discussions about how to advance the development of the permafrost SAV.

Presentations:

Title	Speaker	Summary

Permafrost Shared Arctic Variables	**Zoé Brasseur** (SIOS) **Alexandra Meyer** (University of Vienna/Western Norway Research Institute)	Permafrost Shared Arctic Variables (SAVs) are co-designed, community-driven variables that complement essential permafrost climate variables (e.g., permafrost temperature, active layer thickness, rock glacier velocity). They emphasize transdisciplinary exchange between communities and scientists.
Pan-Arctic Observing System of Systems and the Arctic PASSION Project	**Michael Karcher** (Alfred Wegener Institute)	Highlighted the need for local and regional perspectives on key variables, the development of high-resolution observations to monitor changes in the pan-Arctic, and to share tools and give something back to the communities. Future work in the Beyond Arctic PASSION project will consider marine and coastal erosion issues, including permafrost.
Wildfire Shared Arctic Variables - crowdsourcing soil moisture	**Mikko Strahlendorff**, (Finnish Meteorological Institute)	Initiative using co-created variables like terrain moisture and trafficability to identify wildfire ignition risks. Project 'Water in your boots' combines citizen science and real-world impact by engaging hikers in Finnish national parks to provide feedback on terrain moisture.
Permafrost Management Through City Planning and Design: Linking Observations to Snow, Meltwater, and Infrastructure Practices in Utqiaġvik, Alaska	**Matthew Jull (**University of Virginia)	Destabilizing ground conditions challenge Arctic infrastructure, which in turn can accelerate permafrost thaw. Design-oriented planning is needed to produce actionable data for communities, integrating social aspects into infrastructure and urban design.
Ideas and visions for permafrost community work in the framework of the 5th IPY	**David Hik (**University of Alberta)	Building on past successes (e.g., 343 new boreholes from previous IPYs), future efforts should focus on expanding monitoring systems, investing in the next generation of researchers, and strengthening partnerships with Indigenous and Arctic communities.
The ISOSCAN experience	**Kristof Tomej and Eva Duedahl** (University of Southern Denmark)	ISOSCAN is a citizen science project where participants report observations and collect digital and physical objects (e.g., snow samples). It engages both tourists and locals and aims at fostering a sense of community and involvement among all participants.

Early Career Researchers and Youth involvement in Shared Arctic Variables work	**Sarah Strand** (APECS)	Several existing platforms for connecting with youth: Youth Together for Arctic Futures (WWF Global Arctic Program), Polar Early Career World Summit, Permafrost Young Researchers Network (PYRN), and Arctic Youth Conference 2027.
Permafrost internships in communities as part of SAV Permafrost	**Julie Malenfant-Lepage** (Norwegian Univ. of Science and Technology/UArctic)	PermaIntern and SEDNA offer internships open to students and professionals, focusing on skill development and networking across the Arctic permafrost community.
Indigenous involvement in Arctic observations	**Norma Shorty** (University of Alaska Fairbanks)	Indigenous knowledge is distinct from citizen science. There is often a lack of Indigenous voices although Indigenous peoples are right holders. Co-production of knowledge is crucial, as permafrost holds cultural, governance, and intergenerational significance. Indigenous peoples and Indigenous scholars must be included as equal partners.
Experiences from the ELOKA network	**Natasha Haycock-Chavez** (ELOKA-Exchange for Local Observations and Knowledge of the Arctic)	ELOKA's Yup'ik Atlas exemplifies cross-collaboration in Arctic observing, which is an act of governance. Indigenous peoples hold jurisdiction over land, and co-production of knowledge should be seen as governance practice, not just a method.
Permafrost change and cultural heritage in Svalbard	**Eystein Markusson** (Svalbard Museum)	Permafrost thaw threatens Svalbard's cultural heritage, risking the loss of historical structures. Prioritization is needed to preserve selected heritage sites.
Permafrost change and human health	**Ulla Timlin** (University of Oulu)	Permafrost thaw impacts physical, mental, social, and spiritual health. The One Health approach helps understand these effects, using participatory methods to support adaptation, mitigation, and empowerment through knowledge and education.

Recommendations to further develop Permafrost SAVs

Concise Version of Recommendations

- Centre Indigenous and local partnership: prioritise co-development, co-management, community-centred approaches; identify effective, community-relevant ways to share knowledge and results.
- Strengthen interdisciplinary collaboration: expand the permafrost expert panel to include architects, engineers, hydrologists, microbiologists, atmospheric scientists, etc.

- Broaden geographic focus: extend studies beyond the current pilot sites of Svalbard and ISR, and prioritise locations based on community needs.
- Engage communities and future generations: consider citizen science initiatives, organize events for Arctic Youth and ECR
- Expand monitoring and research effort towards IPY.

More details:

Topics and knowledge gaps to consider for the permafrost SAV

- Potential connection between permafrost and air or water pollution (e.g., water contamination in Longyearbyen; air pollution measurements in Greenland)? Permafrost contamination from oil industries could be investigated as well.
- Rusting rivers phenomenon, where thawing permafrost in the Arctic is causing hundreds of Alaskan, Yukon, and Northwest Territories rivers to turn bright orange and acidic.
- Yedoma permafrost landscape changes.
- Permafrost risk perception: the direct connection between permafrost thaw and natural hazards remains uncertain in some locations such as Alaska and requires careful investigating. This can sometimes lead to unnecessary public fear, which could be addressed through education and knowledge-sharing initiatives (e.g., citizen science, workshops) to help clarify risks. Note that permafrost is increasingly recognized as a national security concern. For example, it is now considered an operational domain by the U.S. Department of Defence.

Perspectives and disciplines to include in the permafrost SAV

- Indigenous knowledge.
- Marine and atmosphere scientists, pollution experts.
- Hydrologists who study how permafrost changes impact pollutant transport, water flows, etc.
- Microbiologists who study pathogens and microbes in permafrost.
- Mitigation and permafrost engineering.

Potential pilot sites for the permafrost SAV

- Overall considerations: It is important to consider sites where community interest in permafrost-related issues is strong, places where the community is going to be most interested by the results. Selected sites should also be representative of the different types of permafrost. Finally, including more sites would be better for representativeness and improving modelling.
- Utqiagvik: the community has been working with scientists for decades. There could be a lot of interest related to the permafrost SAV. Example: city cemetery needs to be relocated.
- Inuvik and Yellow Knife in Canada
- Siberia and areas with permafrost in Russia are clearly missing yet crucial to understand permafrost changes.
- Qaanaaq in Greenland could be of interest, although the type of permafrost present is unclear. However, settlements built on sediments but could still be impacted by permafrost thaw.
- Sisimiut in Greenland where a lot of engineering studies are conducted.
- Point Lay in Alaska
- Broaden to include earthquakes-prone regions? Iceland?

Outreach and connection with the broader community

- Asian Conference on Permafrost (ACOP) in June-July 2026
- Earthquakes Conferences in Iceland 2027 ArcticNet's Annual Scientific Meeting 2026 in Halifax
- EU Arctic Forum, Indigenous Peoples' Dialogue and Arctic Youth Dialogue 2026
- Arctic Circle Assembly
- EU Polar Cluster events

Permafrost SAV – way forward

As we move forward with the Permafrost Shared Arctic Variables, it is essential to recognize that different purposes will require different types of data and observations, and to decide whether we want to prioritize certain areas or keep a broader perspective. The panel should leverage existing data and observing systems, aiming for a dynamic approach rather than a static set of variables. The goal is actionable research, with SAVs serving as tangible outcomes that are useful for local and Indigenous communities.

In addition, it is important to keep in mind that researchers also have a responsibility to connect permafrost communities, share expertise, and address educational needs for both students and professionals. Making data accessible and relevant to local and Indigenous communities should be a priority. Finally, we must consider how to compensate community members for their time and input, acknowledging that research is not their full-time occupation.

Legacy and connection to the 5th IPY

Permafrost SAV initiative could evolve into a forum, network, or platform that facilitates cross-community learning, allowing experts to exchange experiences and best practices. It could also serve as a bridge for science-society collaboration, fostering actionable research. Given the Arctic's diversity, such a forum would be valuable for insights and approaches. A potential goal for the IPY could be to establish a functioning ecosystem by the 5th IPY. Additionally, it is crucial to challenge the traditional notion of 'pure' science (i.e., natural sciences) by integrating social sciences and diverse knowledge system, including Indigenous knowledge.

Relevant resources:

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

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

Improving Arctic Observations: Wildfire Shared Arctic Variable & Terrain Trafficability

Chairs:

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

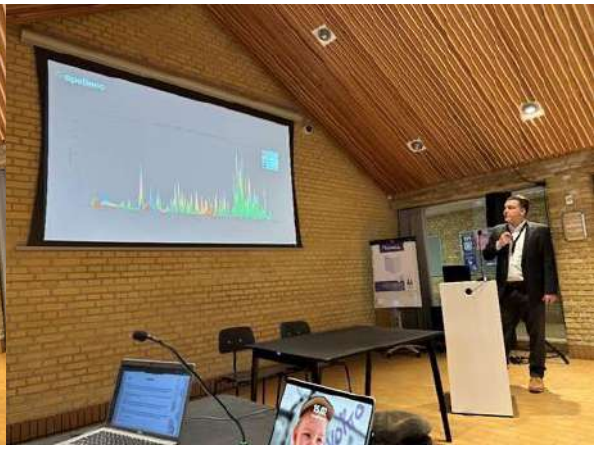
Session summary:

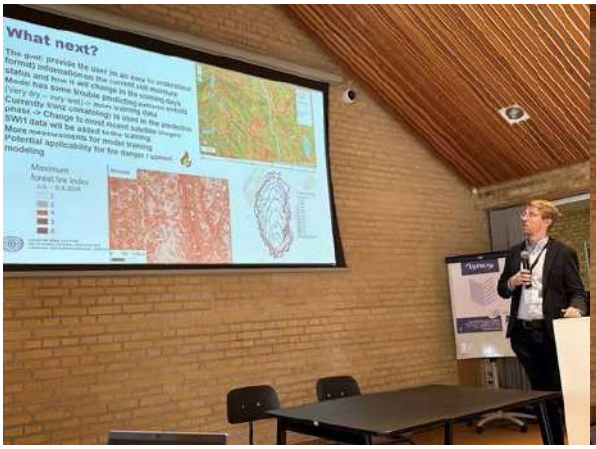
This Wildfire session was called: “Improving Arctic Observations: Wildfire SAV & Terrain trafficability”. In the session, we highlighted efforts to implement the Wildfire Shared Arctic Variable and demonstrate our mobile tool for in-situ observations. Machine Learning is used to support smart routing in wet and wildfire preparedness in dry conditions.
Anni Kröger from the Finnish Meteorological Institute welcomed everybody to the session and showed the agenda and goals. The goals of the session were:

- 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.

First, Mikko Strahlendorff from the Finnish Meteorological Institute told about our Wildfire SAV journey and machine learning weaving together satellite and in-situ observations to produce end-user services and apps tackling local challenges. He presented IBA project, Arctic PASSION and CryoSCOPE advances.
Then, Miska Kauppinen from Spatineo, told more about Water in your boots mobile tool for in situ observations and results from the campaign last summer.
Then, Joonas Kolstela from FMI, told about machine learning for terrain trafficability from EO data: combining user observations with meteorological and satellite data through ML to forecast soil wetness conditions.
After that, Mikko Strahlendorff talked about a forward-looking vision of end user service delivering wildfire risk and terrain trafficability information and sharing ideas from our Indigenous experts from IBA Olos final seminar.
Then we had open discussion where we had some ready prepared questions to kickstart discussions. Those were about feedback on technical solutions and what mobile tool could display? Who could support implementation? Next steps for wildfire SAV?
There were lots of discussion and questions between the presentations as well as at the end. For example, if observations have been made e.g. on tundra side and not just in forests, about GPS accuracy being so poor, if one can change made observations afterwards after learning. There were plenty of questions related to XGBOOST, using of satellite data and temperature data. Trafficability was seen as

could be good for Indigenous but also maybe for military applications. Validation could be used, maybe with Canadian forest fire indexes or accumulated moisture during the season.





During the Closing Plenary, Mikko Strahlendorff presented the recommendation from our Wildfire session as described below.

Recommendations:

Arrange sharing sessions to join efforts for more impactful results, aka gather more observations, motivate more observers!

Who: All SAV and research teams doing observations crowdsourcing
How: Use respective project funding to meet or webinar
When: Within next year
Why: More engagement from local observers and more observations

Relevant resources:

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

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 (hwayner@alaskaconservation.org);
Tav Ammu, Alaska Sea Grant (tammu@alaska.edu)

Session Summary

The Bristol Bay Salmon Expert Panel (EP) shared initial findings from a four-phase collaborative process focused on Chinook salmon observing in the Bristol Bay watershed. The Sustained Arctic Observing Networks (SAON) Roadmap for Observing and Data Systems (ROADS) process, an initiative under the Arctic Council and International Arctic Science Committee, convened the panel. The International Arctic Research Center facilitated the work, with support from the Sasakawa Peace Foundation and the National Science Foundation.

The EP drew 14 members from across the region's fisheries landscape: a commercial fishermen's coalition, an Alaska Department of Fish and Game (ADF&G) biologist, federal fisheries agencies, non-profit conservation organizations, fisheries consultants, and university affiliates including Tamamta Fellows and Alaska Sea Grant.

Harmony Wayner (Alaska Conservation Foundation) opened the session by grounding participants in regional context: the vast scale of western Alaska, the significant cost and time required to reach the area's 31 tribes, and a year-round traditional-use harvesting calendar that ties community well-being to the yearly cycle of mixed-stock, mixed-species salmon runs.

The EP organized its preliminary recommendations by user group and domain, following a four-phase process that moved from ideation through a Food Sovereignty Working Group, to listening through an Indigenous Liaison team, to panel formation, and into the current report finalization phase.

The Donkersloot et al. (2020) well-being framework anchored the session and the panel's recommendations. The framework organizes community outcomes across eight domains: economy and livelihood, environment, health, safety, culture and identity, social relationships, education and knowledge, voice and agency, and governance. Centering recommendations in this framework distinguishes the EP's work from monitoring efforts built primarily around biological or economic outputs.

Tav Ammu (Alaska Sea Grant) presented the ecological context. Chinook abundance and body size are declining across the Yukon, Kuskokwim, and Bristol Bay systems, even as regional sockeye runs trend upward. Bristol Bay's Chinook monitoring focuses on the Nushagak River drainage. Managers discontinued sport fish logbooks, leaving a gap in catch accounting. Shrinking Chinook are increasingly difficult to distinguish from sockeye on sonar. Counting towers offer limited watershed visibility, and

ocean-phase dynamics remain poorly understood. Managers currently rely heavily on post-season analysis and pre-season projections built on incomplete in-season data.

Jamie O'Connor (Intertidal Consulting for the International Arctic Research Center) presented the EP's preliminary recommendations, expanded upon below, and moderated the discussion.

Four tensions recurred through audience discussion. First, the sport fish lobby exerts disproportionate influence on management frameworks, overshadowing traditional-use and local commercial interests. Second, an audience member raised bycatch from the Bering Sea pollock fishery as a likely contributor to Chinook declines, a gap the panel acknowledged. Third, the physical distance between UAF research infrastructure and Bristol Bay communities limits collaboration. Fourth, flat state budgets create political volatility in ADF&G funding that undermines monitoring continuity.

Participants also discussed how to get ahead of potential salmon range shifts northward, emphasizing the need to establish local priority access before agencies create new permit districts. The session closed with open discussion on adapting the ROADS expert panel model for other regions and identifying partnership pathways from participants' current work.

Session Recommendations

Recommendation 1: Fund sustained, multi-district Chinook observing in Bristol Bay

Who: Federal agencies (NOAA Fisheries, NSF, U.S. Fish and Wildlife Service); State of Alaska (ADF&G); private and public funders

How: Extend Chinook enumeration beyond the Nushagak River drainage through multi-year funding commitments; restore discontinued sport fish logbooks and develop skipper science programs as low-cost catch accounting supplements; invest in sonar technology capable of distinguishing Chinook from sockeye at reduced body sizes; fund sonar-independent abundance assessment including weirs and mark-recapture studies through the Bristol Bay Science and Research Institute; expand AI and drone pilot programs to improve enumeration accuracy.

When: Now; treat restoration of lost capacity as a higher funding priority than expansion into novel systems.

Why: Chinook monitoring covers only one drainage in a watershed with 31 tribal communities and significant variation in run timing and tributary use. These data gaps impair management decisions and fall hardest on traditional users and place-based commercial harvesters who have limited ability to substitute other protein sources or adapt to in-season closures.

Recommendation 2: Embed social science observing capacity alongside biological monitoring

Who: Federal agencies and private funders; university research programs; ADF&G

How: Fund sustained social science observing that tracks household food security, harvest effort, sharing networks, and substitution strategies across seasons and years; build observing systems that explicitly connect biological indicators such as run timing, size composition, and tributary availability to

traditional-use access and household-level outcomes; measure observing investments against well-being outcomes, not only scientific outputs.

When: Now; treat social science observing as core infrastructure, not a supplement to biological programs.

Why: Chinook decline hits communities across multiple well-being domains at once. Inaccurate data has proven to create direct negative impacts on community members' food security and access. Pursuing accurate biological data hand in hand with social science returns a far more holistic view of the "value" of the fishery. Without social science data, managers cannot assess or respond to cumulative impacts on food security, cultural continuity, or economic resilience.

Recommendation 3: Engage Indigenous knowledge holders as co-designers, with funded participation and clear data governance

Who: Funders; federal and state agencies; research institutions

How: Budget participation by Indigenous and rural experts as a standard line item in all observing projects; establish data governance agreements before data collection begins, with protocols covering ownership, access, use, and return of findings; return results to communities in accessible, culturally appropriate forms; engage knowledge holders as co-designers rather than informants or validators.

When: Now; data governance agreements must precede data collection, and co-production will only work moving at the speed of trust.

Why: Indigenous communities hold multi-generational observational knowledge of Chinook behavior, run timing, and habitat use that existing monitoring infrastructure does not capture. Without governance agreements and funded participation, engagement requests place an unfunded burden on communities that are already absorbing the sharpest impacts of Chinook decline. Opportunities for longer-term, deeper research and less seasonality are created when Indigenous knowledge holders are key leaders and contributors of the program.

Recommendation 4: Invest in coordination, workforce development, and local monitoring capacity as core observing infrastructure

Who: Federal and state agencies; Alaska Sea Grant; private funders; tribal governments and Alaska Native Claims Settlement Act (ANCSA) corporations

How: Support multi-year internships, apprenticeships, and local monitoring roles with mentorship built in as an explicit program goal; develop the Arctic Data Center's Salmon Knowledge and Information Portal as shared community infrastructure; fund coordination and facilitation roles as essential program costs rather than overhead; support the Bristol Bay Regional Career and Technical Education program and the Bristol Bay Commercial Fishing Training Apprenticeship program as entry points into fisheries science and stewardship careers.

When: 1 to 3 years; workforce pipelines require sustained investment to produce continuity.

Why: Local monitoring expertise has eroded significantly. Fewer than half of commercial fishing permits in Bristol Bay are held locally. Regional unemployment runs 6 to 10%. Monitoring programs that bypass

local capacity generate data without community ownership and collapse when external funding cycles end.

Recommendation 5: Build toward a Bristol Bay Salmon Coalition and/or Commission as a shared governance structure

Who: Tribal governments; ANCSA corporations; state and federal agencies; NGOs; commercial fishing, harvesting, and processing industry

How: Fund facilitation and legal costs to develop a shared governance structure; return data generated by observing systems to communities in formats they can use for local decision-making and advocacy; make transparent how data limitations shape management decisions.

When: 3 to 5 years.

Why: Bristol Bay lacks the coordinating body that other major Alaska salmon regions use to integrate community, scientific, and management perspectives. Without a shared table, community concerns reach managers through fragmented channels and carry unequal weight. Without a coordinated and collective representative body, local opinions and priorities are easily brushed aside by regulatory bodies. A Coalition and/or Commission adds weight and strength to community members reliant on the outcomes of the regulatory system.

Recommendation 6: Invest in international high seas and EEZ salmon research to close the ocean-phase data gap

Who: Federal agencies (NOAA Fisheries, NSF, North Pacific Anadromous Fish Commission member nations); international research partners; U.S. congressional delegation

How: Expand U.S. participation in coordinated high seas salmon research through the North Pacific Anadromous Fish Commission, including trawl surveys, tagging programs, and oceanographic monitoring that tracks Chinook distribution, condition, and survival during the marine phase; integrate Bristol Bay-origin stock identification into international survey designs so ocean-phase data informs watershed-scale management; advocate for restoration of U.S. funding commitments to the International Year of the Salmon and successor programs; engage NPFMC processes to ensure bycatch accounting in the Bering Sea pollock fishery reflects current Chinook abundance and size trends; negotiate data-sharing agreements between federal research agencies and Bristol Bay communities so ocean-phase findings reach communities alongside in-river monitoring data.

When: 1 to 5 years; NPAC engagement and NPFMC advocacy can advance in the near term, while expanded survey design and community data-sharing infrastructure require longer investment horizons.

Why: Bristol Bay Chinook are declining in both abundance and body size, and in-river conditions and harvesting patterns alone do not explain those trends. Ocean-phase survival, prey availability, thermal conditions, and bycatch mortality all likely contribute, but existing observing infrastructure offers little visibility into what happens to Bristol Bay-origin fish after they leave freshwater. International high seas research programs are the most scalable mechanism for generating that data. Without U.S. investment and engagement, the ocean-phase gap will persist regardless of improvements to in-river monitoring,

and managers, communities, and researchers will remain unable to distinguish climate-driven change from other mortality sources.

Relevant Resources

Donkersloot, R., et al. (2020). Assessing the sustainability and equity of Alaska salmon fisheries through a well-being framework. *Ecology and Society* 25(2). https://doi.org/10.5751/ES-11549-250218

Donkersloot, R., Wayner, H., Ringer, D., Salmon, A., Salmon, J., Carothers, C., Black, J., and Igiugig Village Council. (2025). Immeasurable sovereignty: Indigenous well-being, fishery science, and sustainable governance. *Ecology and Society* 30(4).

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

Shoen, E., et al. (2023). Divergent responses of western Alaska salmon to a changing climate. *Arctic Report Card 2023.* NOAA.

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

Main Chairs:

Claudine Hauri (University of Alaska Fairbanks, chauri@alaska.edu)
Emily Lescak (University of Alaska Fairbanks International Arctic Research Center, RNACoobs, elescak@alaska.edu)
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Session summary:

This full-day workshop at AOS/ASSW 2026 in Aarhus brought together 50–70 participants across three sessions to advance co-production of knowledge (CPK) as a rigorous and practical approach to Arctic research. The morning session, held in the Indigenous Pavilion, was dedicated to relationship-building through paired conversations, small group discussion, and a whole-group sharing circle — establishing from the outset that there is no single starting point for this work. The afternoon introduced the concept of multiple entry points, anchored by a Mentimeter survey showing participants spanned the full spectrum from curious to lived experience, and moved into breakout groups and plenary synthesis around persistent barriers: relationship-building that funding structures rarely support, early-career access constraints, institutional metrics misaligned with co-production, power dynamics around funding and decision-making, and the need to move community engagement to the beginning of the research process rather than the end. The final session examined case studies across marine, atmosphere, cryosphere, and terrestrial disciplines, and turned to structural reform — identifying funding eligibility rules, ethics review processes, authorship norms, and promotion criteria as key leverage points — before closing with discussion of a Community of Practice built around shared case studies, mentorship, and a proposal development incubator.

Participant reflections were strongly positive. The format, moving from pairs to small groups to the full group across a full day, was described as energizing rather than exhausting, and the time spent on relationship-building before discussing science was seen as both rare and intentional. Case studies were particularly valued for demonstrating concretely that science and Indigenous Knowledge can work together. One substantive critique: the workshop felt North America-heavy in both participants and framing — a gap that should be addressed in future editions by more deliberately including Greenlandic,

Fennoscandinavian, Siberian, and other Arctic Indigenous contexts. There is a clear and strong appetite for more: participants called for multiple sessions at the next ASSW, with professional facilitation.

Recommendations:

1. Researchers: Self-educate before engaging in co-production

Who: All Arctic researchers
How: Research and self-learn Indigenous-authored journal articles on co-production of knowledge and ethical engagement; follow Indigenous research protocols and ethics specific to the communities you intend to partner with before initiating any collaboration.
When: Before starting co-production work; ongoing as a professional practice.
Why: Respectful and effective co-production requires foundational knowledge that is not typically part of standard scientific training. Arriving informed reduces burden on communities and signals genuine commitment

2. IASC: Support formal training in Indigenous and decolonial methodologies

Who: IASC (as the organizing body for Arctic science)
How: Develop or support training programs covering Indigenous methodologies, decolonial methodologies, CARE data governance principles, Free Prior and Informed Consent (FPIC), and cultural competency. Co-production requires mixed methodologies; training should be integrated into existing Arctic science programs and career development pathways.
When: Next program cycle; incorporate into ASSW and other IASC events as a recurring offering.
Why: There is a recognized training gap. Interest in co-production is high but formal guidance is limited. Institutions currently reward publications over community engagement, and this needs to change structurally.
Additional details: Multiple participants called for professional facilitation and multiple sessions at the next ASSW, not just one. This recommendation directly responds to that appetite.

3. Funders: Co-create funding solicitations with intended Indigenous beneficiaries

Who: Funding agencies
How: Before issuing funding solicitations intended to benefit Indigenous communities or advance co-production, engage those communities in designing the solicitation, including research priorities, eligibility requirements, and reporting expectations.
When: At the solicitation design stage, before release.
Why: Research questions currently stem largely from researcher curiosity rather than community needs. Reversing this requires structural change at the funding level, not just individual researcher goodwill.

4. Researchers and institutions: Rebalance expectations placed on communities

Who: Individual researchers; institutions and universities
How: Follow an ethical and equitable model for community engagement that minimizes burden on Indigenous Peoples' and their communities, organizations, and governments. Write community compensation (including observer and knowledge holder stipends, honoraria, paid positions) into grants from the start at rates that are meaningful. Do not ask communities to contribute their time and knowledge without compensation or for minimal compensation.
When: Immediately; built into grant design from the proposal stage with direct guidance from Indigenous proposal partners.
Why: Communities are overburdened by research demands. Power dynamics around who controls funding perpetuate extractive relationships even when researchers have good intentions. Early-career researchers in particular lack the funds and institutional support to do co-production equitably

5. IASC and funders: Set aside dedicated funding for relationship-building and pre-proposal work

Who: IASC and major Arctic research funders
How: Reserve a defined percentage of Arctic research funding for planning grants, preproposal development, and capacity-building activities specifically focused on relationship building with Indigenous communities. These grants should not require a research deliverable — relationship-building is the deliverable.
When: Next IASC funding cycle; advocate for inclusion in current program reviews.
Why: Genuine co-production requires time to build trust that cannot be compressed into a standard project timeline. Without dedicated funding for this stage, co-production remains aspirational for most researchers, especially early-career scientists who lack the flexibility of senior researchers.

6. Researchers and institutions: Make yourselves more accessible and prepared

Who: Individual researchers and academic institutions
How: Reduce barriers to engagement — logistical, linguistic, and cultural. Approach communities with humility and grace, acknowledging that everyone is at a different point on this journey.
When: Ongoing; institutional policy changes in the near term.
Why: Communities want to work with early-career researchers to build long-term relationships and shape their development. But institutions currently make this difficult through incentive structures that reward outputs over relationships. The idea of "outreach" must be reframed: community engagement should happen at the beginning of the research process, not at the end.

Relevant resources:

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

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

Chairs:

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Gunn-Britt Retter, Saami Council, gbr@saamicouncil.net
Harry Johansen, film director
Evie Morin, Research Institute for Sustainability, evie.morin@rifs-potsdam.de

Session summary:

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 explored how recent multilateral Arctic biodiversity action-oriented documents by the Arctic Council and its intergovernmental and interparliamentary observers consider Indigenous knowledge. Then, we explored 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. Woven throughout the discussion was a generative exchange among Indigenous participants from across the Arctic, sharing their communities' knowledges and approaches to adapting to environmental change, particularly shifting fisheries resources such as pink salmon and Kamchatka crabs. We concluded with recommendations for strengthening equitable partnerships and ensuring Saami leadership in Arctic decision-making and observation.

Recommendations:

Support two-way capacity building and knowledge exchange between Indigenous Knowledges

Who: Research institutions/funding bodies, researchers
How: From Holmberg et al. (2023):

- Provide direct funding to Indigenous researchers and Indigenous-led organizations (p.12)
- Support Indigenous-led assessments of the structural requirements for Indigenous-led research, to better understand barriers and policy needs, and to frame recommendations for actions to address them (p.12)
- Ensure opportunities for Indigenous Peoples to review funding proposals (p.12)
- Establish Indigenous-specific calls for funding proposals (p.16).

When: Establish structures now and ongoing, with IPY as a near-term priority
Why: The inclusion of Indigenous Knowledges in Arctic research is increasingly recognized in dominant academia, particularly for their contributions to understanding environmental baselines, changes, and

sustainable practices. However, this inclusion is too often driven by utility to dominant academic objectives. While more resources are directed to co-productive work, having at least one partner representing dominant academic perspectives is often assumed. This assumption shapes project processes and outputs, and limits support for exchanges led entirely by Indigenous Knowledge Holders themselves.

Indigenous Knowledges are not homogenous. Supporting exchanges designed, led, and evaluated by Indigenous Peoples across different Knowledge systems opens space for work that dominant academic partners may not be positioned to initiate, value, or assess. This kind of exchange strengthens the protection and actualization of Indigenous Knowledges on their own terms, supports self-determination, and produces a more comprehensive and locally grounded knowledge base for addressing the changes and challenges in the Arctic.

Recognize and redress power asymmetries across Knowledge Systems

Who: Research institutions/funding bodies, researchers
How:

- Practice individual and institutional reflexivity to surface and address biases and power asymmetries (Holmberg et al., 2025).
- Restructure funding and decision-making through permanent, remunerated leadership roles for Indigenous rightsholders, revised eligibility criteria that recognize expertise beyond formal academic credentials, accessible calls, and support across the full project cycle (Holmberg et al., 2023).
- Review application requirements to ensure that potential applicants with limited resources are not excluded (Holmberg et al., 2023).
- Allow for non-traditional research outputs defined and designed by Indigenous Peoples (Holmberg et al., 2023).

When: A practice starting now, with priority ahead of IPY
Why: Respectful partnership across knowledge systems requires examining where inequity persists in practice. One revealing example is how knowledges are positioned relative to one another: Indigenous Knowledges are frequently framed as culturally contextualized, emphasizing their grounding in tradition and worldview, while dominant academic knowledges, without such examination, are treated as value-neutral, obscuring the fact that dominant academic knowledges are also shaped by epistemologies. In practice, this assumed neutrality and universality means Indigenous Knowledges must justify their inclusion through utility to a broader project, while dominant knowledge requires no such justification. The practice of reflexivity, critically reflecting on positions, biases, and assumptions and how these factors influence situations and contexts, at both individual and institutional levels can help surface inequities that may otherwise go unexamined, creating conditions for more equitable exchange (Holmberg et al., 2025).

Similar asymmetry extends to how experts are recognized. Dominant academia validates expertise primarily through formal academic credentials, excluding many Indigenous Knowledge Holders who are recognized as experts within their own systems in other ways. Genuine respect requires Rightsholders have access to stable, funded positions and leadership roles, such as principal investigators, project leads, and participants in developing funding calls and evaluation. This structural shift can help minimize harm, reduce extractive dynamics, and support Indigenous self-determination.

Uphold Indigenous rights in practice, beyond project bounds

Who: Research institutions/funding bodies, researchers
How:

- Distinguish Indigenous from local knowledges. Use UNDRIP as a broad Framework for upholding Indigenous rights and listen to Indigenous leaders (e.g., Arctic Council Permanent Participants) for interpretation at a finer scale (Inuit Circumpolar Council, 2020; Saami Council, 2024).
- Guided by Indigenous experts, develop training in academic institutions and funding bodies to better understand the distinct rights of Indigenous Peoples (Holmberg et al., 2023)
- Promote the full inclusion of Indigenous Peoples in all aspects of Arctic research, decision-making, and capacity building not based on benevolence or paternalistic attitudes, but on a clear understanding of the rights of Indigenous Peoples (Dorough, Degai, and Williams, 2023 in Holmberg et al., 2023).

When: A practice starting now, with priority ahead of IPY
Why: Increasingly, researchers in dominant academia recognize the need to uphold Indigenous Rights, but are uncertain how. An indicator of this gap is the frequent conflation of Indigenous and local knowledges, a false equivalency that highlights a fundamental misunderstanding of what Indigenous Rights actually entail. The Inuit Circumpolar Council and the Saami Council, both Permanent Participants of the Arctic Council, have been clear that this conflation undermines the unique status, rights, and roles of Indigenous Peoples (Inuit Circumpolar Council, 2020; Saami Council, 2024).

The term "Indigenous Peoples" carries distinct legal recognition, grounded in multigenerational relationships to place and in self-governing structures that predate and exist independently of contemporary states. Maintaining this distinction in language is a starting point that should be reflected in how Indigenous Peoples are included in all aspects of Arctic research and observing systems beyond the boundaries of individual projects: as self-determining peoples with distinct rights.

Relevant resources:

1. Inuit Circumpolar Council. (2020). Policy Paper on the Matter of “Local Communities.” https://www.inuitcircumpolar.com/project/policy-paper-on-the-matter-of-local-communities/
2. Doering, N.N., Dudeck, S., Elverum, S., Fisher, C., Henriksen, J.E., Herrmann, T.M., Kramvig, B., Laptander, R., Milton, J., Omma, E.M. Saxinger, G., Scheepstra, A. J. M. & Wilson, K. (2022). Improving the relationships between Indigenous rights holders and researchers in the Arctic: An invitation for change in funding and collaboration. *Environmental Research Letters*, *17*(6), 065014.
3. Herrmann, T.M., Brunner Alfani, F., Chahine, A., Doering, N., Dudeck, S., Elster, J., Fjellheim, E., Henriksen, J.E., Hermansen, N., Holmberg, A., Kramvig, B., Keskitalo, A.M.N., Omma, E.M., Saxinger, G., Scheepstra, A. J. M., van der Schot, J. (2023). Comprehensive Policy-Brief to the EU Commission: Roadmap to Decolonial Arctic Research. University of Oulu, Helmholtz-Centre for Environmental Research-UFZ, The Indigenous Voices (IVO) research group – Álgoálbmogiijienat, Arctic University of Norway UiT, Saami Council. Áltá – Kárášjohka – Leipzig – Oulu. https://doi.org/10.25365/phaidra.400
4. Holmberg, A., Morin, E., Chahine, A. S., Doering, N. N., Dudeck, S., Fisher, C., Hermansen, N., Herrmann, T. M., Ikaarvik, Kramvig, B., Omma, E. M., Riedel, A., Saxinger, G., Scheepstra, A. J. M., van der Schot, J. (2023). Towards Arctic Research Upholding Indigenous Peoples’ Rights: Recommendations for ICARP IV, the International Conference on Arctic Research Planning. Saami Council, Research Institute for Sustainability – Helmholtz Centre Potsdam, Ecologic Institute. Kárášjohka – Potsdam – Berlin. https://doi.org/10.25365/phaidra.459

5. Saami Council. (2024). Policy Paper on Indigenous Peoples and «Local Communities». https://www.saamicouncil.net/documentarchive/policy-paper-on-indigenous-peoples-and-local-communities
6. Holmberg, A., Ikaarvik, and Morin, E. (2025). Ethical Collaborations in Arctic Research: Guidance for Researchers and Indigenous Communities. Saami Council, Ikaarvik, and Research Institute for Sustainability – Helmholtz Centre Potsdam. Kárášjohka – Mittimatalik – Potsdam. https://doi.org/10.48481/rifs.2025.029
7. 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

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

Chairs:

Natasha Haycock-Chavez (ELOKA, natasha.haycock-chavez@colorad.edu),
Victoria Qutuuq Buschmann (Inuit Circumpolar Council Greenland),
Rowenna Gryba (ICC Canada),
Candice Sudlovenick (SIKU),
Donna Hauser (Arctic Alaska Observatory and Knowledge Hub)

Session summary:

"Strengthening Arctic Observing Through Indigenous-Led and Community-Based Monitoring Initiatives," was co-convened by Natasha Haycock Chavez (Exchange for Local Observations and Knowledge of the Arctic), Victoria Qutuuq Buschmann (Inuit Circumpolar Council Greenland), Rowenna Gryba (ICC Canada), Candice Sudlovenick (SIKU), and Donna Hauser (Arctic Alaska Observatory and Knowledge Hub). The first hour was dedicated to sharing examples of Indigenous-led programs from across the Arctic grounded in principles of Indigenous data sovereignty. With over 50 attendees filling the room, the second half shifted to small group discussions organized around three themes: barriers and enablers, Indigenous data sovereignty, and data use and decision-making. Each group spent 30 minutes in discussion before sharing a key takeaway with the room.

After the small group discussions, each group shared the following takeaways:

- Barriers and enablers group: highlighted the value of individuals who can make things better—creative, flexible navigators who find ways forward.

- Indigenous data sovereignty group: noted that while the theory of Indigenous data sovereignty is relatively straightforward to understand, putting it into practice is far more complex.
- Data for decision making group: explored the diverse ways of sharing observations and knowledge, and how these directly shape how information is ultimately used.

Overall, the session successfully built on a similar conversation ELOKA co-convened at AOS two years ago in Edinburgh, continuing to advance how we support Indigenous-led observing across the Arctic and foster coordination among groups doing parallel work.

Recommendations:

These recommendations from AOS 2026 echo recommendations coming from AOS 2024, and we also recognize the current limitations due to the funding and political tone set by the administration.

Data Management Frameworks should be redesigned to fit Indigenous practices rather than forcing Indigenous data into existing Western structures

Who: Funders, government entities, Universities and large scale data and research organizations who help set the tone for data management
How: Cross-collaboration between community-based/led organizations and these larger entities to help shift the data management frameworks to be more inclusive and flexible to Indigenous data practices
When: This should be a continued effort with a goal of getting funding for this for the next IPY.
Why: This will help move the needle forward for Indigenous data sovereignty and for data to action. Indigenous data often loses the important richness and cultural context when Indigenous knowledge holders are forced to make it comply with existing western frameworks. Developing frameworks based on Indigenous practices will support greater Indigenous data sovereignty, as well as greater opportunities for informing decision-making.
Additional details:*(if needed)*

Co-production should be embedded at the proposal and funding-call level so that Indigenous voices shape research priorities from the outset, and community members are recognized as mandatory contributors whose knowledge holds equal standing to academic institutional science

Who: Funders and researchers
How: More collaboration starting before the proposal, as well as funding calls that allow for relationship building time.
When: Now!
Why: Co-production or collaboration with Indigenous rightsholders is often still being added as an afterthought, and therefore is still not mutually beneficial nor fully reflects community priorities.
Additional details:(if needed)

Honorariums for Knowledge holders, long-term funding planning that doesn't expire mid-relationship, and dedicated community liaisons for ongoing engagement were also highlighted as essential

Who: Funding entities
How: More funding for honorariums and community liaisons
When: Now!
Why: Funding for Knowledge holders and community liaisons is necessary for the longevity and sustainability of community-led observing.
Additional details:(if needed)

Centering Indigenous Observations in Arctic Marine Wildlife Management and Conservation

Chairs:

Roberta Tuurraq Glenn (University of Alaska Fairbanks - UAF), rjglenn@alaska.edu

Donna Hauser (University of Alaska Fairbanks)

Session summary:

Our AOS session brought together 25 colleagues, principal investigators, knowledge exchange facilitators, boundary spanners and early career researchers to explore the value and essential role of local observations and Indigenous Knowledge (IK) to support marine wildlife conservation and management in the Arctic. Goals for this session included:

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

We opened up the session with a survey of existing community-based monitoring projects and networks to review geographic scope, observing parameters and topical themes of projects catalogued in the Atlas of Community-based Monitoring in a Changing Arctic (see here, presented by Natasha Haycock-Chavez (ELOKA)). Session participants were asked to provide information for any resources or observing projects not captured in this initial overview of existing projects. Panelists Donna Hauser (Alaska Arctic Observatory & Knowledge Hub), Claudine Hauri (UAF International Arctic Research Center), and Victoria Buschman (ICC-Greenland) then presented use case examples from their projects on how local observations and Indigenous Knowledge of marine resources have been mobilized, including specific barriers and enablers that were encountered along the way. Questions for the panelists included:

- How do Indigenous observations contribute to marine science, conservation or wildlife management in your example?
- What were barriers to the inclusion of Indigenous observations (and how were they overcome?)
- What enabled you to be successful?
- What are next steps to mobilize Indigenous observations with your intended audience (decision-makers, scientists, co-management, local or Tribal organization)?

Barriers and Enablers for Mobilizing Observations

Session participants split into two breakout groups to share relevant barriers and enablers to mobilize local observations and Indigenous Knowledge in their work.

Persistent challenges shared by session participants included lack of sustained funding and capacity both within academic and governance institutions and among Indigenous Knowledge holders to participate and engage in this work. At a deeper level there is a disconnect and sometimes competing goals that circumvent support of IK integration into decision making.

Spaces for building relationships and bridging knowledge systems were identified as important enablers alongside building off of and through existing observing networks. The importance of developing guidance on how and where to engage with IK observations was mentioned.

Recommendations:

Several existing and long-term Arctic observing networks represent timely, underutilized and valuable datasets housing a wealth of information and particularly, environmental observations, that can be directly applied to a broad range of applications. These applications include marine mammal co-management, enhancing large scale ocean and climate model outputs to be more responsive to coastal community priorities, and understanding the implications of Arctic environmental change as they relate to the Arctic marine food web.

Indigenous-led observations capture local scale and timely environmental conditions linked to wildlife health, ecology, and harvesting that are otherwise unavailable to resource managers and decision makers. Indigenous-led observations are essential to understanding and responding to climate-induced changes. Local observations are an underutilized resource that have the potential to meet immediate needs and fill critical data gaps today.

- Identify opportunities to address key barriers (most commonly reported) to mobilizing Indigenous observations in marine conservation and wildlife management.
- Compile a comprehensive catalogue of existing Arctic Indigenous observing programs, with a particular focus on Arctic marine fish and wildlife ecology.
- Fund research activities that involve mobilization of existing observing projects, databases and other long-term records that are otherwise not being utilized to their fullest potential.

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)
David Allen (UCAR/CPAESS, allend@ucar.edu)

Session summary:

Observing inventories can help identify gaps, build connections, optimize resources, and clarify future directions for Arctic observing. This hybrid session explored strategies for discovery and integration through coordinated efforts. An introductory presentation touched on definitions for inventories, observing assets, and asset types. Subsequent discussions were focused on three questions:

- 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.)?
- While respecting Indigenous data sovereignty, 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?

Use cases for inventories were explored in detail based on a preliminary assessment by the SAON Committee on Observations and Networks, with new "snowflake" diagrams generated by participants, for example highlighting a need across multiple scenarios for inventories that are >80% complete covering present efforts across the pan-Arctic (for more: Bradley et al, 2026). Participants emphasized that best practices should be adopted for: standardized access and interoperability; cross-linking funders, projects, campaigns, PIs, sites, and data; and open sharing – perhaps best tied to permitting and overall to enable gap analysis. The group identified that making future progress hinges on: sustained funding; improved coordination; and incentivizing the building and sharing of inventories as a regular, ongoing practice. The use cases, solutions, and next steps discussed in this session need to be carried forward in planning for the next IPY.

Recommendations:

Encourage the creation and interoperable sharing of polar observing inventories — for assets such as sites, stations, platforms, projects, cruises, and more — to better meet a range of user needs and observing goals.

Who: Funders, networks, research infrastructures, and coordination efforts such as SAON, IASC, IARPC, and IPY
How: Formal recommendations, guides for implementation, potential mandates or other incentives
When: Pre-IPY (2026-2028)
Why: To promote open information sharing for visibility, efficiency, collaboration, planning, and assessment.
Additional details:*(if needed)*

Promote the use of established solutions — such as core fields, metadata standards, and controlled vocabularies — to improve the discovery and interoperability of polar observing inventories.

Who: SAON's Arctic Data Committee and Committee on Networks, through collaboration with the Polar Observing Assets Working Group
How: POAwg's identified core fields and metadata standards should be published as a white paper. SAON committees should use their networks and platform to encourage use of those standards, along with sessions at AOS, ASSW, etc.
When: Support ongoing discussions (e.g., IARPC, ASSW, AOS, US AON, POAwg), publish standards and whitepapers (2028), continue sharing AOS whitepapers (https://doi.org/10.5281/zenodo.18807101, https://doi.org/10.5281/zenodo.18806845), and consider advancing future publications.
Why: Small efforts putting together inventories for particular purposes can contribute to larger inventories if they are done with interoperability and discovery in mind from the beginning.
Additional details:*(if needed)*

Sustainably fund and maintain inventories of polar observing assets to enable gap assessment, optimize limited resources, avoid duplicated effort, facilitate collaboration, and engage local communities.

Who: Funders, national institutions (e.g., AWI), agencies, logistics providers
How: Initial funding is necessary to assure progress.
When: ~2030
Why: Beyond the initial creation of inventories or the interoperability structures to facilitate them, to have sustainable longer-term hosts and homes for publicly available inventories. The visibility provided by inventories will also facilitate greater utilization of existing resources. These inventories are consistently needed to support bigger efforts (e.g., ARoRA, IPY, AOS, FARO, federal reports), but without a steady home, we have to recreate this effort every 3-10 years.

Develop inventory infrastructure and interoperability through proposal-scale work

Who: Experts in data and metadata systems across multiple countries/funding systems
How: Do the legwork to develop cyberinfrastructure, crosswalks, guidance, etc., to make it possible for groups to contribute inventory efforts and information in the future.
When: 2026 - 2029 (ahead of IPY)
Why: Time and funding investment are necessary to develop the open-source systems that can support community-scale inventory sharing. Build on the volunteer work done by POAwg.
Additional details: An important part of the design is to think about the transition from build phase to the maintenance phase – who takes over to keep information up to date? Keep in mind potential uses

for the inventories and required specifications in order to make the information captured in the inventory system relevant and useful.

Broad adoption of contributing to inventories as a "good science" practice

Who: Everyone developing Arctic observing capacity (agencies, networks, research groups, etc)
How: Establish a community norm of sharing observing capacity through inventories. There has been great progress towards data sharing becoming standard practice: similar cultural shifts would be needed towards observing capacity sharing.
When: 2030 and beyond
Why: Make it possible to more efficiently use observing capacity, better communicate across different aspects of the observing community, and to document the work being done towards Arctic observations and monitoring.
Additional details: Mechanisms for citing observational assets and resources would be valuable for incentivizing contributions.

Relevant resources:

Short Statement and White Paper:

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

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

Related Efforts:

- Sustaining Arctic Observing Networks (SAON), https://arcticobserving.org/
- SAON Polar Observing Assets Working Group (POAwg), https://www.polarobservingassets.org/
- US Arctic Observing Network (US AON), https://usaon.org/

Data Systems

Chairs:

Vanessa Raymond, Alaska Center for Energy & Power, vlraymond@alaska.edu
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DAY	TIME	TOPIC
31 March	8:00-9:30am	Actionable data towards IPY
1 April	11:00-12:30pm	Data Systems: Data as protection

Session summary:

1. Data looking forward to IPY

As we are now 6 years away from the next International Polar Year the AOS Data Working Group wanted to bring IPY Planning to the front of discussions. This 1.5 hour session had presentations from the Arctic Data Committee (ADC), Norwegian Meteorological Institute (MET), and Canadian Polar Data Consortium (CPDC). Presentations focused on current data tasks and initiatives and ongoing work at MET and within Canada through the CPDC. The session addressed both data specialists and "non-data" consumers, emphasizing the evolution of polar data management toward a unified Arctic Data Space. Central to the discussion was the concept of a Data Commons, inspired by UN and CODATA frameworks, which advocates for a paradigm shift toward coordinated international funding and policy efforts. Participants explored the entire data value chain from initial observation and quality control to publication and societal impact. Highlighting national projects like the Canadian Polar Data Consortium as models for future implementation.

A large portion of the session was reserved for attendee discussion and engagement. Participants brought thoughtful questions and suggestions such as the need for better data management training in all aspects (braided into academic courses, workshops provided by data experts, mini credential courses, etc), the need for better task and initiative mobilization (to ensure non-data people are aware of the data projects/initiatives underway).

Who: International/National Funding Bodies participating in IPY5 & internal process of IPY

What: Support Data Training (pyramid scheme training), long-term data management initiatives (data standardization, knowledge transfer of existing programs)
When: BEFORE ramp-up of IPY5 (2-4 years)
How: Coordination through the existing bodies we have BUT also include broader groups
Why: To increase impact of data and improve upon things from last IPY

Recommendations:

1. The Transition to an Integrated Arctic Data Space. A primary focus is the evolution of polar data management toward a unified Arctic Data Space addressing technical, semantic and legal interoperability
2. Coordinated policy and sustained funding for an Arctic data commons

2. Data protections

The Data Protections session, held on April 1, 2026, featured a panel titled "Data as Protection," which brought together Indigenous scholars and technologists to discuss the intersection of AI, governance, and community sovereignty. Led by Vanessa Raymond, the session challenged the perceived neutrality of technology, centering Indigenous knowledge systems and governance frameworks from Iñupiaq, Ahtna, Métis, and Cayuga perspectives. Bringing together Indigenous scholars and technologists working at the intersection of AI, data governance, and community sovereignty. Grounded in lived experience, we explored how Indigenous knowledge systems challenge dominant approaches to technology and ask who decides, who benefits, and what responsibilities come with building these systems. Panelists, including Jeff Doctor and Jeff Ward (Animikii), Dane Melenfant (McGill Univeristy), and Cana Uluak Itchuaqiyaq (Center for Sustainable Engagement in the Arctic) explored critical questions regarding reciprocity, accountability, and consent in the era of machine learning. The session concluded with interactive reflections on participants' individual responsibilities and relationships to data, utilizing tools like word clouds and brainstorming rounds to define what data means within a community context.

The session had the opportunity to then host a 30 minutes worth of breakout groups tailored to attendees panel interest. Each panelist provided a breakout group prompt to help guide discussions. The prompts were: How have you found current software unable to meet Indigenous data sovereignty requirements? / How have you/could you get Indigenous communities involved in not only generating data but using it for community decision making in hands-on, practical ways? / If Indigenous knowledge can shape ethics and frameworks, why can’t it shape algorithms?

Who: Everyone who works with Indigenous Peoples and their Data
What: 1) Utilize Indigenous data sovereignty principles and protections when conducting research
2) Ensuring ethical transformation between data to information for decision making
When: Always
How: Apply and invest in Indigenous Data systems and technologies
Why: Bringing CARE and responsibility to data collection, storage, processing, and use; empowerment of Indigenous People and ethical partnership

Recommendations:

1. Centering Indigenous Governance in Technological Systems: This session focuses on challenging the idea that technology is neutral by centering Indigenous knowledge systems and governance frameworks. A recommendation would be for researchers and technologists to move toward relational approaches to knowledge, ensuring that AI and data systems are built with an understanding of who decides, who benefits, and who is made invisible.

2. Operationalizing Reciprocity and Consent: The session emphasized the ethical responsibilities of working with Indigenous communities, specifically regarding reciprocity and accountability. A practical focus would be implementing mechanisms for meaningful consent and data protection, potentially utilizing tools like "Local Contexts" legal agreements or specific data standards for Indigenous data sovereignty.

Technology

Chairs:

Maribeth Murray (University of Calgary),
Craig Tweedie (University of Texas at El Paso),
Øystein Godøy (Norwegian Meteorological Institute),

Session Overview

This Technology Session brought together international researchers, agency representatives, industry partners, and early career researchers to assess the state of technology for Arctic Observing. Sessions covered three thematic areas: (1) AI and Machine Learning, (2) Drones and Remote Sensing, and (3) Other Technologies and Innovations and Associated Challenges. The session used short presentations, open discussion, and flash talks to showcase successes, limitations, and challenges. There were 48 participants in these sessions, coming from 11 countries, 15 universities, 10 government agencies and three not-for-profit research organizations.

To prepare this synthesis the session chairs utilized Claude Sonnet 4.6 via the Claude desktop applications V1.66080.0 (f65729) for Mac on April 6, 2026. Sonnet is the default LLM for Claude and was employed to compile this summary from a combination of zoom recordings and the written notes of three rapporteurs. The AI-generated summaries were edited for accuracy, clarity, and the inclusion of post-session reflections by Session Chairs and attendees.

Session goals

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

Session Schedule

Day	*Time*	*Room*	*Topic*
Tuesday	8:00–9:30	Mogens Zieler Stuen	Introduction and Geneal Discussion
Tuesday	10:00–12:00	Mogens Zieler Stuen	AI and Machine Learning
Tuesday	13:30–15:30	Mogens Zieler Stuen	Drones and Remote Sensing

Key Themes

1. Artificial Intelligence (AI) and Machine Learning (ML)

There was consensus among the session participants that Arctic Research has generally fallen behind progress made other regions of the world with respect to the use of AI and ML applications. While use is expanding rapidly, there are still significant issues with respect to data readiness, training, application of best practices and readiness, ethics, and infrastructure

support. To assess the current state of AI/LLM application participants showcased examples as summarized below.

Applications Showcased

- Ocean Networks Canada (ONC): ML-assisted quality control for hydrophone and camera data streams, training systems to detect anomalies autonomously.
- Alfred Wegner Institute (AWI): Remote sensing AI for landscape disturbance (thaw slumps) across Siberia, NW Canada, and Alaska; permafrost carbon foundation models.
- Arctic Passion Project (AP): Combining AI tools with remote sensing to build optimal sea ice variable time series.
- Finnish Meteorological Institute (FMI) SmartMet Server: Open-source platform ingesting multi-source data, enabling AI-ready standardized outputs.
- UK Competitions such as Kaggle, and Artificial Intelligence for Stable Isotope Tracers (AISIT): Crowdsourced AI solutions for data rescue and stable isotope freshwater tracking in the Arctic (43 data points; aisit.co.uk).
- Canada Biogenome Project and Genomics to Support Arctic Conservation and Biodiversity: Developing in-house LLMs to maintain data sovereignty while enabling computational linguistics across scientific literature.
- Digital Twin of Research Vessel (UK-BAS): Integrating navigation and science data to support carbon-efficient routing decisions.
- Built Environment Mapping: European Commission Joint Research Centre - AI for population models and hazard exposure from Sentinel imagery.
- Tiny/Micro ML: Embedding AI into low-power chips for real-time anomaly detection on autonomous platforms.
- AI for Journal and Literature Management: Automating copy editing and database maintenance (e.g., Arctic journal).

Challenges and Concerns

- Significant human effort is still required to prepare data for AI/ML. This is often underappreciated by funders, consulting partners, and some research disciplines.
- Spatiotemporal scaling remains problematic; iterations are needed before models generalize.
- Brain drain is a real risk as skilled AI/ML postdocs and students are increasingly moving to the private sector.
- AI is often used as a “black box” — transparency is critical; hallucinated citations and synthetic data risks are real.
- The climate footprint of AI is difficult to estimate; communities are increasingly pushing back on data centre energy and water use, particularly in places where water is already an overused resource.
- Crossing disciplinary boundaries (domain vs. technical expertise) remains a structural challenge.
- High Performance Computing (HPC) access and dedicated computing time is insufficient for many research teams.

- There is evidence of mixed messaging and stigma around AI use that has delayed broader adoption, especially among more senior researchers and some community groups.

2. Drones and Remote Sensing

Drone technology is maturing rapidly, with multiple operational programs in the Arctic. Key barriers remain around weather, regulation, data standards, capacities for test-bedding, and long-term O&M.

Innovations and Programs Showcased

- Tromso Arctic Simulation Centre (TASIC): Autonomous drone dock-and-recharge system for year-round profiling (3 profiles/day); integration with satellite data; startup 2027, operations 2028.
- University of North Dakota and the Cold Regions Research and Engineering Lab (CRREL), New Hampshire: Conducting Light Detection and Ranging (LiDAR)-based point cloud analytics along the Dalton Highway in Alaska to identify permafrost road damage; Kubernetes-orchestrated cloud workflow for large datasets.
- Starlink-enabled commercial services: Remote drone and buoy servicing in Alaska (Shaun Gleeson), enabling new data-as-a-service models.
- Digital twins: VLX3 drone-based LiDAR for permafrost digital twinning, integrated with National Science Foundation supported Arctic Data Center archiving in the US.
- Water-based drones: Under development at the Swedish Marinaburg testbed; permitting remains a critical barrier.
- Multi-domain systems: Norway is developing drone-airplane-satellite integration networks.
- Low-tech innovations for monitoring and observation: Expendable weather balloons for storm modeling (Japan); cameras on seafloor for biodiversity (Canada and others); power line heat monitoring for climate data (Norway).

Persistent Challenges

- Icing: Begins 15–20 minutes into drone flights; solutions being explored include thermal management, anti-icing coatings, and docking systems for short efficient flights.
- Satellite connectivity gaps: Significant coverage limitations north of 84°N.
- Permitting: Marine/surface drones face unresolved permitting regimes; products sold without permit-readiness.
- Data archiving: Drone datasets often sit on local servers and are not openly accessible; capacities for documenting and archiving the exponentially growing mass of drone imagery and other products is not being met by current data management practice.
- Sampling contamination: Drone disturbance of aerosol fields requires standardized protocols.
- Long-term Operations and Maintenance (O&M): Maintenance of remote sensing infrastructure requires local workforce development and dedicated funding.

- Airspace management: Restricted zones complicate polar operations, though Arctic airspace is comparatively less restrictive than continental Europe.

3. Cross-Cutting Technology Themes

Open Source and Data Sharing

- Strong community consensus to prioritize open-source tools and data standards over proprietary systems.
- Open-source platforms (e.g. FMI SmartMet, SAON/IASC Arctic Data Committee) cited as models for interoperability.
- Proprietary industry relationships and reliance create sustainability challenges when project funding ends.
- Emphasis on publishing data in open formats (e.g., Network Common Data Form – NetCDF) for permafrost) before converting to proprietary formats.

Citizen Science and Community-Led Monitoring

- Mobile/Cell phone observing apps are gaining traction but require sustained maintenance which is challenging in the context of term-limited projects.
- Community-based sensing (e.g., Japanese balloon sondes, private depth sounders for bathymetry in Tuktoyaktuk) are cost-effective observing strategies.
- Local workforce development and local engagement is critical for sustained observing and for establishing locally relevant observing priorities.
- Researcher 'parachute science' (i.e. short duration visits with limited intellectual and other investment in communities) concerns were raised: community members note that field visits are becoming shorter as technology improves and/or becomes more reliable and remotely accessible.

Near-Real-Time Data Transmission

- Demand is high for actionable, near-real-time data for community safety, logistics, and a range of science needs.
- Starlink and new communication protocols (e.g., local area networks for autonomous platforms) are expanding capability rapidly.
- Atmospheric measurements over the central Arctic Ocean remain a major gap with no coordinating sounding network. This represents a priority area for innovation.

AI Ethics and Carbon Accountability

- There is growing concern about the unmeasured carbon footprint of AI systems; there are some European mandates for carbon reporting.
- UK Research Councils are committed to net zero but lack tools to accurately estimate AI-related emissions.
- LUMI (Finland) cited as example of near-zero-emission HPC infrastructure.
- Social and environmental license issues: growing community rejection of data centres due to energy and water demands.

Recommendations

AI and Machine Learning

1. Develop and promote AI data-readiness standards: Adopt best practices for data formatting, spatial scaling, and quality control prior to AI application. Reference existing tools (ADC, FMI SmartMet, FAIR+ approaches, etc.).
2. Establish cautionary principles and guardrails for use of AI in Arctic science: Address hallucinated citations, data leakage, independent benchmarks, and the ethics of training using data from original research.
3. Develop carbon accounting frameworks for AI use: Provide comparable metrics to enable researchers and funders to assess whether AI use is justified relative to energy and water costs.
4. Use AI to address critical observing gaps: Prioritize AI-assisted data assimilation for addressing regional/disciplinary gaps (e.g. the lower atmosphere over the central Arctic Ocean, microwave satellite data), gap-filling climate records, and optimization of sampling logistics.
5. Invest in autonomous and AI-enabled systems: Prioritize systems that can operate in darkness, winter, and without continuous human oversight (e.g., drone sleeping modes, seasonal activation).
6. Support next-generation researchers: Embed AI literacy early in academic training; develop ECR retention strategies to address brain drain to the private sector.
7. Develop methods for AI-assisted observing system design: Use AI to identify observation gaps and design efficient, multi-scale monitoring networks.
8. SAON should develop guidelines for responsible use of AI in Arctic observing, including reproducibility standards, citation of AI-generated content, and synthetic data documentation.
9. Remain engaged with the global AI community: Leverage competitions, hackathons (e.g., Kaggle, Polar Data Forum), and international collaborations.

Drones and Remote Sensing

10. Establish standards for drone-based data collection and calibration: Develop protocols for flight planning, sensor calibration, acceptable uncertainty, data formats, and archiving — with input from WMO (PCAPS working group) and modelers.
11. Recognize drones as a unifying technology: Treat drone-based observing as a multidisciplinary approach capable of bridging atmospheric, ecological, cryospheric, and oceanographic communities among others.
12. Develop a drone data working group and/or standard: Work within existing bodies (WMO, ADC, GCW) to produce community data standards (e.g., NetCDF for drone-derived vertical profiles).
13. Advocate for improved permitting frameworks and build best practices for drone use near communities and wildlife: Engage regulatory bodies on surface drone permitting, Indigenous airspace rights, wildlife impact protocols, and security requirements for

drone manufacturers. Align with CARE principles and environmental impact requirements.

14. Improve international awareness of and access to testbed facilities: Share information on Arctic testbeds (TASIC, FMI Pallas, Marinaburg, Denmark over-horizon facility) and develop pathways for international researchers to use them.
15. Address drone data archiving as a priority need: Develop approaches for matching archiving budgets with the rapid growth of drone-based sampling; explore for satellite archives and philanthropic data storage (e.g., Voice of the Ocean) as example options.
16. Integrate drone programs with digital twin development: Use drone LiDAR and sensor data to build digital twins of Arctic landscapes and infrastructure.
17. Review ICARP IV RPT1 recommendations: Cross-reference and build upon prior Technology session outputs from AOS.

Cross-Cutting Recommendations

18. Prioritize open-source platforms and open data: Advocate for open standards across drone systems, AI tools, and data repositories. Reference previous AOS Technology outputs and ministerial commitments.
19. Add citizen science and mobile observing apps to core agendas: Sustain funding for app maintenance; develop training pathways for community-based observers.
20. Support ECR involvement from the outset: Embed early career researchers in drone programs, AI development, and data working groups. Support field schools and training exercises.
21. Use hackathons as a capacity-building mechanism: Polar Data Forum hackathons (bi-monthly) offer a proven model for training, standards development, and community building.
22. Invest in simplification and low-cost technologies: Ensure that attention to advanced systems development is balanced by investment in simple, cost-effective solutions and accessibility to these for a broad range of users.

Proposed Next Steps

Immediate Actions (6 to 12 months)

- Compile a complete list of recommendations from past AOS Technology sessions and circulate for community input.
- Establish a Drone Data Working Group under ADC/Polar Data Forum to develop draft standards for data collection, formats, and archiving.
- Develop a scoping document for SAON - AI Use Guidelines, drawing on session discussions and global AI governance frameworks.
- Circulate ICARP IV RPT1 recommendations to Technology Working Group members for cross-referencing.
- Coordinate with WMO PCAPS on vertical profiling data standards and assimilation workflows.

Medium-Term Actions (12 to 24 months)

- Develop an AI Data Readiness Best Practice guide in collaboration with ADC, FMI, and partner institutions.
- Launch a Polar Data Forum hackathon focused on drone data standardization and AI data preparation challenges.
- Develop carbon accounting tools and pilot mandatory AI carbon reporting in at least one major Arctic observing program.
- Advocate for improved testbed access (TASIC, FMI, Marinaburg) through Arctic Council working groups, SAON, and emerging coordination groups linked to the next IPY.
- Develop an Early Career Researcher (ECR) field school on Arctic drone operations and AI/ML methods, potentially linked to TASIC startup activities (~2027).
- Explore a collaborative proposal to address the central Arctic atmospheric observing gap using reanalysis, ship-based instrumentation, and AI-assisted data assimilation.

Longer-Term Actions (24 months to IPY)

- Work toward operational drone dock-and-recharge infrastructure for year-round vertical profiling across multiple Arctic sites (target: 2028 based on TASIC model).
- Integrate digital twin technology into Arctic research vessel operations and expand to commercial shipping.
- Develop multi-domain observing systems (drone–airplane–satellite integration) as a standard approach for Arctic atmospheric science.
- Build a cross-national testbed network with improved international access protocols and shared infrastructure funding.

Resources

- AISIT (AI for Stable Isotope Tracers): aisit.co.uk
- LEXcube visualization: lexcube.org
- ADC (Arctic Data Centre): adc.met.no
- Polar Data Forum Hackathons: polardataforum.org
- FMI SmartMet Server: open-source, available via FMI GitHub
- TASIC (Tromso Arctic Simulation Centre): startup 2027
- ICARP IV RPT1 Recommendations: cross-reference required
- UArctic Thematic Network on Drones: search UArc thematic network registry
- Voice of the Ocean (data philanthropy): voiceoftheocean.org

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?

Recommendations:

Recognize the contributions of early career researchers in developing and writing funding proposals

Who: Grant writers, PIs, everyone

What: acknowledge contributions in funding proposals

When: continuously

How: Similar to specific acknowledgements in manuscripts

Why: starting to chip away at institutional barriers of who can write grants

Encourage mentoring by mid-career professionals to ease transition from training roles to early career positions

Who: PIs, “mid-career”/established folks
What: early career professional range
When: continuously/plans towards 2027
How: a network of folks who are willing to be contacted as established/mid career
Why: utilizing skill sets built by ECRs and sharing with the broader community and people entering the space

Thank you to everyone who helped make this Arctic Observing Summit a success!

SAON
SUSTAINING ARCTIC OBSERVING NETWORKS

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Arctic Observing Summit 2026 Report