# Arctic Observing Summit 2016

Synthesis of white papers and short statements received for Theme Four
"Actor and stakeholder engagement and needs in sustained Arctic observations"

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## Overview of theme

Rapid Arctic change is impacting a range of stakeholders at regional and global scales. Arctic observing systems hence need to serve a dual function, providing critical information to actors and stakeholders (interested in or impacted by Arctic change, or interested in learning about change and taking action), and supporting scientific research. Such hybrid observing system approaches require the empowerment and involvement of actors and stakeholders at all stages of system design and operation, including capacity-building and taking action. The role of knowledge and observing needs is critical as an integral part and prerequisite of all of the stages. Developing or strengthening observing systems to address capacity building or in support of community emergency response plans and adaptation are therefore critical contributions to the theme. These may address different models of community engagement, and data and information transfer approaches meant to serve the knowledge needs for communities faced with threats from climate change, coastal erosion and other emergencies. Adaptation and long-range planning are critical components in community survival, especially when faced with short or long-term natural disasters or natural changes that are difficult to deal with. The long-term well-being and sustainability of Arctic communities and the resilience of the environment depend on dialogue and solutions based approaches which pivot on strong partnerships, trust, respect and open communication.

## Summary of papers received

16 papers were submitted to the theme, six thereof were white papers. Half of the 10 submitted short statements were of extended length. The submissions covered initiatives with a wide range of topics and perspectives, shedding light on diverse aspects linked to actor and stakeholder engagement and needs in observations. These aspects include hazard or risk preparedness, mitigation, and management (Alessa et al., Eicken et al., Kilioni et al., Scott et al.), adaptation and resilience to changing conditions (Armstrong et al., Carson and Sommerkorn), scenario-planning (Arp et al.), Indigenous Knowledge (Sharing Knowledge Workshop Participants (ELOKA)), communication for bridging between different communities or institutions (Crump et al., Druckenmiller et al., Lovecraft et al., Timm et al.), monitoring of biodiversity and of the benefits nature provides to people (Barry and Price, Geitz et al.), economic development (Lazareva), and business opportunities in observation (Krynicki). The common thread of all the papers is the importance of engaging people beyond the scientific community in gathering, interpreting, and acting on observational information from the Arctic. These "stakeholders" are defined in various ways, and are sometimes explicitly, more often implicitly, recognised in their role as actors in decision-making processes. While some general principles emerge from the white papers and statements, their specific focus is often obscuring the identification of overlapping or reinforcing findings. It will be through the discussions at the Arctic Observing Summit that contributions will be refined and develop into an actionable agenda responding to observation needs.

## Highlights of contributions

In this section we take a closer look at the received white papers and statements to tease out trends and opportunities for responding to the needs of stakeholders for involvement in observations.

Several initiatives organised by the Arctic Council provide new and exciting context for linking observations closely to stakeholder and actor needs. These initiatives explore novel avenues for pan-Arctic scientific assessments that can potentially affect long term commitment to observations. They also link much more closely to regions and communities than Arctic Council assessments have done in the past while keeping the pan-Arctic perspective.

Armstrong et al. describe the imminent development of the Arctic Council's Adaptation Actions for a Changing Arctic (AACA) assessment to a collaborative science-based decision-making enterprise that includes stakeholder consultations, science, and decision-support in an iterative management loop to more effectively inform adaptation actions for both scientific agenda-setting and decision-making. Such an enterprise would include co-designed sustained observation networks to support scientific research, and would also provide feedback to both science and decision-makers for how science-informed decisions are performing.

Another Arctic Council study on the benefits that people receive from nature (ecosystem services) scoped the context for recognising and capturing these values in decision making (Geitz et al.). Through the context of observing, the study brings into focus intriguing new fields for monitoring—monitoring the values people hold for nature, rather than only monitoring nature itself. Such observations require cooperation between science and stakeholders from the outset as observed values need to be defined in a relevant stakeholder community context, rather than being pre-defined by the research community alone. Such an approach also offers the potential for new scientific communities, such as social anthropologists and economists, to become involved in observations, and to provide for new science-stakeholder partnerships and additional engagement and research tools, such as questionnaires and workshops to identify and formulate values held for nature.

Carson and Sommerkorn report on a project for monitoring and strengthening the societal capacity of dealing with uncertainty and rapid change. They make the case for developing indicators for resilience, based on key capacities of the social-ecological system that facilitate effective adaptation to disturbances, or transformative change, if needed. Such key capacities are livelihoods, knowledge and the capacity to learn, the capacity for self-organisation, and, cross-cutting these three, diversity and assuming change. They argue that co-producing such indicators in a participatory process will allow monitoring of, but will also contribute to, community capacity for engagement and adaptation.

In implementing the recommendations of the Arctic Biodiversity Assessment through an action plan (Barry and Price) the Conservation of Arctic Flora and Fauna working group of the Arctic Council (CAFF) includes sustained biodiversity monitoring plans with expert assessments and communication efforts to inform action by national authorities, regional stakeholders, and international organisations.

A number of papers speak to the important dimension of communicating information or knowledge between different communities or institutions and what consequences for communication arise from the observation needs of different stakeholders and actors.

In arguing for a strategic communication process for developing researcher-stakeholder relationships Timm et al. offer a concise communication theory background to inform observation efforts and achieving participation of critical audiences. Applying such an approach, they argue, can help

research teams to select target audiences, understand stakeholder engagement goals, and collaborate efficiently in bringing scientific research to application with end-users.

Lovecraft et al. show how the Arctic Environmental Response Management Application portal (ERMA) can serve as an example of information bridges between major institutional actors operating in the dense and often overlapping governance space linked to sea ice. They argue that, in order to maximize data production, dissemination, transparency, and participatory capacity across stakeholders, scientific observations should be tied to the services that sea ice provides and their governance by relevant institutions.

Concerned with disseminating scientific information to broad audiences Druckenmiller et al. report on a website platform communicating "why sea ice matters" as a comprehensive go-to resource for decision-makers and the media. The project involves research efforts to track and evaluate how information from science reaches stakeholders and informs decisions to allow the research community keeping pace with the evolving needs of arctic decision making.

Crump et al. report on a project that has catalysed researchers, NGOs and communities in the Arctic and Small Island Developing States to document the risks posed by climate change, identify opportunities for adaptation, and raise awareness. They profile an example of digital storytelling, an approach that is increasingly being used in community-based research to document impacts and adaptations to climate change. Important project objectives were also to build a stronger voice and capacity in the Arctic and Small Island Developing States in international climate negotiations and to develop community-driven research to elucidate vulnerabilities and build adaptive capacity.

An important aspect of communication are the caveats of sharing knowledge from different knowledge domains, specifically in efforts where Indigenous Knowledge is shared, processes and disseminated along with scientific knowledge. The Participants of the Sharing Knowledge Workshop (ELOKA) specify some of the challenges and opportunities of Indigenous participation in sharing knowledge with researchers or other actors with different worldviews in a more connected, including digitally connected, Arctic. Considering Indigenous Knowledge, they remind us, must consider context of knowledge, including the language and worldview of the Indigenous actor who holds that knowledge, and the place it comes from.

An often ignored area of discussion in the Arctic is the issue of risk management and preparedness. Kilioni et al. intend to bring greater awareness to this deficiency through the Arctic Risk Management Network (ARMNet). This purpose of this network is to facilitate greater cooperation, improve communication and exchange among American and Canadian academics and practitioners, mitigation of risks, emergencies and disasters in the Arctic regions. Its aim is to assist regional decision-makers through the sharing of research, best practices and creating inter-operability. This is a critical step to assure, not only preparedness but also local observational involvement in decision-making.

Alessa et al. will perform a similar function via a systems or multidisciplinary approach that engages partners to improve awareness of trends, conditions, and activities for improved scientific data collection and to maintain regular communications between agencies, local organizations and knowledgeable individuals that are instrumental in local observational understanding and key to problem resolution.

Currently, it is believed by many researchers, agency personnel and responders that local response and capabilities to hazards and disaster are poorly documented and poorly understood and the connection between remote Arctic communities and response entities is fragmented at best

therefore not effectively operationalized. These papers identify paths forward to bring researchers, observers and responders to highlight the need for hazard and risk preparedness, mitigation, management and improved collaboration.

## Identification of commonalities and areas of future collaboration

This paper does not attempt a synthesis of the contributions received. Rather, it aims to identify common threads in the submitted material that can inform a debate at the Arctic Observing Summit and beyond concerned with identifying aspects of future initiatives that build capacity for mutual learning and for engaging in decision-making processes. Strengthening the role of stakeholders and actors in such ways is particularly important or even essential, as it is rarely the scientific community that carries things through to this step. Scientific endeavours are more likely to respond to the needs of policymakers and stakeholders when those affected by change have the capacity to participate in decision-making. Human development in the Arctic, the well-being of its peoples, and the continued resilience of ecosystems depend on dialogue, learning, and partnerships between science and decision-making, with observing in a central role.

Next, we explore how a number of identified trends in the submitted material could inform and guide further debate on how to develop further the field of observation with a particular focus on stakeholder needs and engagement.

A first trend is the increasing momentum for observing collaboration between researchers and various stakeholder communities—we received many examples of involvement of stakeholder communities in creating relevant information from scientific observations. However, we also note that the observation community has not yet widely connected to social and political science fields. Doing so would, for example, make clearer to all involved the agency role of involved actor and stakeholder communities for long-term Arctic sustainability, including self-determination, education, capacity-building, and knowledge co-production, as a result of involvement in observation initiatives. It may therefore lead to increased efficiency of disseminating scientific data for application in decision-making processes at all levels. It may also the increase the capacity of stakeholder communities for deliberative participation in decision-making processes, and also for meaningful contributions to scientific observations. Last but not least the analysis of these involvements may in turn provide opportunities for social and political science research.

A second trend is the increasing awareness that the interface between nature and people needs better conceptualisation and consideration in observing activities—in addition to physical human-nature relations cognitive relations expressed through e.g. values associated to sets of services from nature become important, as they define cultural context or are important elements of adaptive capacity. This trend influences what information is considered important for observation itself, and it also prompts more interdisciplinary cooperation, and more attention to the formulation of stakeholder needs in ways that may often be an extensive initial part of the observation project.

A third trend is, almost inevitably, a growing number of sophisticated, often web-based, products that are customised for producing observation-based information linked to specific stakeholder groups or particular issues of concern. Through developing these products a wealth of tools is co-produced, such as portals, sensors, and applications for (e.g. spatial) analysis or (e.g. web-based) communication, that are potentially available for future development of observation partnerships. Recognising that incentives for scientist engagement focus on novelty, and that scientific data production on one hand, and community capacity building and applying data in decision-making on the other, occur on quite different timescales, the question must be asked how to secure interest and capacity of scientists in observation partnerships. Being conscious about the dimensions of co-

production of knowledge and learning through sustained stakeholder-science partnerships may be key to tackling this challenge.

In summary, there is increased awareness of the complexity of available knowledge to inform observing, stakeholder involvement and communication. There is also increasing awareness of the complexity of geophysical, ecological and social change and the need for identifying what information, communication, and stakeholder involvement may allow scientific observation to be applied in actor's decision-making processes. Developing an actionable agenda responding to these opportunities provides exiting new opportunities for developing observation initiatives and programs.

A discussion of the above themes at the AOS and beyond that seeks to identify principles for an actionable agenda furthering the involvement of stakeholder in observation efforts may be guided by the following questions, which correspond to the breakout session of the stakeholder engagement and needs theme at the 2016 Arctic Observing Summit:

1. What are novel or emerging observations important to communicate to stakeholders that also have consequences for science?
2. What is the best method of empowering local Arctic observers to be more actively involved with agency responders in observational reporting, research collaboration, risk mitigation and disaster recovery?
3. What approaches and tools are suited to involve stakeholders and build capacity, or in other words, how can observations be embedded in initiatives that aim to strengthen stakeholder capacity to learn and take action?
4. What observations are needed for identifying sustainable pathways in the context of responding to social-ecological change?

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