

Arctic Observing Summit White Paper Synthesis

Theme 6 Thematic Working Group

Interfacing Indigenous Knowledge, Community-based Monitoring and Scientific Methods for Sustained Arctic Observations

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INTRODUCTION:

Indigenous Knowledge is important for identifying and assessing environmental change; consequently, it is an essential element in Arctic observing systems. Despite this, we still lack effective frameworks that allow for culturally appropriate exchange and analysis of information between environmental sciences and Indigenous Knowledge. To address this challenge, a total of 16 white papers and short statements (*refer to* REFERENCES) were submitted to Theme 6 that discussed best practices and suggested models that apply an Indigenous Knowledge lens to observation systems and understanding the Arctic. This synthesis provides the basis for recommendations that the Thematic Working Group would like to build upon during the 2016 Arctic Observing Summit (AOS). Some of the key messages include:

- **Informed decision-making requires a full picture of Arctic Systems that includes both Indigenous Knowledge (IK) and science.** Indigenous Peoples are not stakeholders (Raymond-Yakoubian et al., Bronen). The Arctic has been home to Indigenous Peoples for thousands of years. Informed decision-making requires a full picture of Arctic systems and how they function. A successful observation system that provides this information will include both IK and/or scientific assessments (e.g., Snow et al., Roue et al.).
- **There are successful observing systems that take an IK lens.** Community-based Monitoring (CBM) initiatives that engage Arctic residents in observing and monitoring the environment can be positive models. However, IK and CBM are not synonymous. Many CBM projects that take a community-driven approach in gathering science-based observations provide elements for 'best practices.' Some of the concepts presented in the submissions to Theme 6 addressed the need for best practices (e.g., Drunkenmiller et al., Fidel et al., Johnson et al., Magdanz, Maynard, Raymond-Yakoubian et al.) or suggested some ideas for best practices, including the need for education (Barnhardt), capacity building and the co-production of knowledge (Snow et al., Roue et al.). In addition to these concepts it is important to recognize that Indigenous Arctic Peoples have their own methodologies for observing and evaluating the environment and these should be supported.
- **Sustained, successful observation networks require connectivity across scales.** There is a strong imperative for Indigenous Peoples to be a part of any decision-making framework (Drunkenmiller et al., Knopp et al.). For this to happen, both efforts and information must cross scales, from a village and regional level to state/federal and international levels. For example, linking IK and community-driven research with decision-makers; providing pathways for information flow in order to have successful, sustained observing programs that are meaningful to IK holders and Indigenous communities as well as to decision-makers; ensuring transparent processes for decision-making (e.g., in research and policy).

The need for information to cross scales was included either in the paper or during the review process (e.g., Naotaka, Skean, Maynard, Knopp et al.). There are several projects in early stages (e.g., Skean et al., Bronen, Panda et al.) that suggest this type of information would benefit the project.

WHAT IS INDIGENOUS KNOWLEDGE (IK)

With growing interests to engage IK in a meaningful way comes the realization of various challenges. As noted above, one of the challenges is how to define and utilize IK. Though different definitions of IK and IK-related terms are circulated throughout academic institutions and government agencies, it is important for us to look to the holders of this knowledge to understand what it is. The Inuit Circumpolar Council has developed the following definition (ICC Alaska 2015):

“Indigenous knowledge is a systematic way of thinking applied to phenomena across biological, physical, cultural and spiritual systems. It includes insights based on evidence acquired through direct and long-term experiences and extensive and multigenerational observations, lessons and skills. It has developed over millennia and is still developing in a living process, including knowledge acquired today and in the future, and it is passed on from generation to generation.”

Under the ICC definition, IK goes beyond observations and ecological knowledge, offering a unique ‘way of knowing’ to identify and apply to research needs which will ultimately inform decision makers. It is important to understand that IK is systematic; IK holds methodologies and reasoning; IK has evaluation and analysis processes. If this is understood and accepted, Arctic observing can begin to move toward a stronger equitable and collaborative approach to understanding the changes occurring within the Arctic.

With increased awareness about IK and the importance of including an IK lens in scientific endeavors and within decision-making it is even more crucial to be clear and consistent with the use of terminology than it was in 2013. Discussions about the IK terminology are a good example of this lack of consistency and awareness. IK systems have been variously expressed as Traditional Knowledge, Indigenous Knowledge, Traditional and Local Knowledge, Traditional Ecological Knowledge, etc. These terms are increasingly referred to in policies, management documents and elsewhere. However, these terms are not necessarily all synonymous and must be defined when used. The application of IK by an agency will depend upon what word is specifically referenced, and defined, in a policy. Further complicating this issue is that these terms are often defined and used differently across scales. For example, the term local knowledge within an Indigenous village may refer to localized IK. While nationally and internationally the same term is used to describe a completely different knowledge system than IK. The distinguish between these two terms is important and without a clear understanding of what knowledge system is being worked with or clear understanding of the terms being used often results in a misunderstanding of IK and at times marginalization of IK holders. Scientific terminology, for example, is quite specific when referred to in policy; the same rigor should be applied to the reference of Indigenous Knowledge. As stated above, it is encouraged that those using these terms refer to the knowledge holders to define their knowledge.

WHERE HAVE WE COME SINCE AOS 2013?

Huntington (2013) synthesized the white papers and short statements submitted to AOS 2013. In 2013, many different “stakeholder” perspectives were consolidated under one theme. That theme was comprised of Indigenous Knowledge and CBM as well as other perspectives that are presently addressed by Theme 4 for AOS 2016. The important issues and recommendations from the 2013 synthesis that apply to AOS 2016 Theme 6 can

be considered within one of three general areas: 1) advancement and measurable forward progression, 2) opportunities for advancement in the near-term, and 3) gaps identified in 2013 and remaining needs in 2016.

Advancement and measurable forward progression:

In the United States, funders are beginning to look for ways to increase engagement of IK with the assistance of social scientists (e.g., the North Pacific Research Board's Arctic Project and NSF ARCSEES both require that social science be a part of proposals). Within Canada, the Northern Contaminants Program is a successful example of a partnership approach with the federal government and Indigenous peoples. Additionally, there are strong examples of collaborative research conducted within Ocean's Canada. The Arctic Council has consistently recognized the importance of Indigenous Knowledge in past declarations. The most recent declaration, the Iqaluit Declaration states the following,

“Recognizing that the Arctic is an inhabited region with diverse economies, cultures and societies, further recognizing the rights of the indigenous peoples and reaffirming our commitment to consult in good faith with the indigenous peoples concerned, and also recognizing interests of all Arctic inhabitants, and emphasizing the unique role played by Arctic indigenous peoples and their traditional knowledge in the Arctic Council” (Iqaluit Declaration. 2015).

Furthermore, the declaration recognizes the Ottawa Traditional Knowledge¹ Principles put forward by the Arctic Council Permanent Participants.

But, efforts are still needed to ensure that Indigenous Knowledge is recognized, in its own right, as equivalent to science, and how it may be used together with science. ICC-Alaska (ICC-Alaska. 2015) recently published a major report that defined food security from an Inuit Alaskan perspective that used an IK lens in its approach that provides tangible examples for progressing with these issues.

Since AOS 2013, several efforts have sought to identify and connect various CBM efforts (e.g., Exchange of Local Observations and Knowledge of the Arctic (ELOKA), Sustaining Arctic Observing Networks (SAON) in particular the CBM inventory, the CBM Atlas of Community-Based Monitoring & Indigenous Knowledge in a Changing Arctic (www.arcticcbm.org)). These efforts show that there are existing projects that are considered successful from a number of perspectives (e.g., community, tribe, scientist, IK holder, decision-maker, natural resource manager). The next steps to further advance IK in CBM include an analysis of the mechanisms constituting best practices. To ensure an IK lens, such an analysis will need to include multiple perspectives, including Indigenous local and regional governing bodies and IK holders.

Opportunities for advancement in the near-term:

Monitoring for effective action or monitoring to address effective resource management as a part of sustained observation networks was a major theme in 2013 and remains an element important to connectivity across scales. Monitoring for applied uses and effective action should strive to include existing networks whether or not they are a part of a CBM or other observing system. For example, there are Indigenous regional organizations and governing bodies across the Arctic that work directly with communities such as the Reindeer

Since the publication of the Ottawa TK principles, some Arctic Council PPs have begun to use the term IK as opposed to TK. Within this paper we chose to use the term IK as oppose to TK, in line with these PPs. The IK definition offered above is comparable to the TK definition offered in the Ottawa TK Principles.

Herders Association and Kawerak. The opportunity to ensure that these regional organizations and networks are a part of designing an observing system is important to ensure that they have adequate capacity to engage in its activities.

Gaps identified in 2013 and remaining needs in 2016:

- *Data management:* Data management remains a challenge today. The 2013 synthesis identified data management as an essential component of a successful observation system. Some of the issues identified include: control of and access to data, representation of qualitative data and information in formats outside of standard data, coordination of various data management initiatives, and management of data. Another issue important from an IK perspective is the categorization, interpretation and ethical use of that data and information.
- *Issues of research review* (e.g. Institutional Review Boards, tribal review, regional organizational review, western science peer review, etc.): consultation and review processes before a project has begun, as well as throughout the life of a project and beyond, remain critical today. Who controls access to funding, permissions, and data are all questions of decision-making power. In many cases, research teams are required to provide very little in order to ‘prove’ to funders or other research reviewers that Indigenous communities have reviewed and approved their research plan. Indigenous communities often do not have the capacity (see below) to fully and meaningfully participate in review processes (if they are even invited to) or have the ability to stop a large research project from happening, or to modify its research design if it is not appropriately addressing their concerns.
- *Community-driven research, crossing scales and the funding paradigm:* The 2013 synthesis acknowledged that sufficient funding is necessary but difficult to obtain for long-term success for community-driven/research based priorities. A major obstacle with securing funding from a regional or community-perspective is effectively crossing scales across multiple dimensions. For example, IK holders and community/regional leadership need to be connected to decision-makers (both in policy and research) and the individual researchers that apply for funding. From a community-perspective the decision-making process for funding research is not always transparent; as processes for decision-making at both scales may differ. At the same time, research priorities identified from an IK perspective at a community and regional-level may not be known or understood by decision-makers. This is an important finding mentioned in white papers and issue statements submitted in 2016 (e.g., Bronen, Roue), and is a major challenge. Addressing these problems will help resolve the major concern that communities have today regarding research and research processes.

WHAT IS CBM & POSITIVE EXAMPLES

Across the circumpolar region there are different definitions and understandings of community based monitoring. Here we will use the Johnson et al. definition, “CBM is a process of routine observing of environmental and/or social phenomena that is led and undertaken by community members and can involve the external collaboration and support of government agencies and visiting researchers” (Johnson et al. 2015).

Both scientific and IK monitoring approaches are important. It is crucial to fully understand each and what types of questions each approach is able to address. To further understand IK monitoring methodologies and interests, it is important to acknowledge that CBM is a new term for a practice that has occurred for millennia.

Indigenous Peoples have always made observations of and monitored change. Understanding ones environment and observing changes has been a matter of survival and directly related to the maintenance of food security. Additionally, like scientists, Indigenous Knowledge holders conduct their observations and experimentation out of a keen interest in their environment.

There are multiple methods that may be employed to conduct CBM, including scientific and/or IK methodologies. These are two distinct approaches and both are needed to gain a better understanding of systems, as well as changes occurring within the Arctic. For example, scientists may rely on calibrated equipment, such as satellites, and their research is hypothesis driven, often to gain a better understanding of a single component of a system. Further, science-driven CBM initiatives tend to be focused on single components and limiting variables.

IK on the other hand holds its own methodologies and often takes a different approach, such as focusing on the relationships between components and multiple variables as opposed to individual components. For example, when considering the distribution and behavior of walrus, IK holders will note the stomach contents of the walrus, in addition to changes seen among clams, while also noting changes in ice and wind. At the same time other community members may collect sea foods (i.e., benthic species) that wash up on the beach, while noting information about the type and size of animals and plants washed up. Sea ice thickness and ocean currents relate to each other; currents relate to benthic species distribution, etc. There are connections between all of these individual components which IK is suited to observe, analyze and act on. It is important to take in all of these observations, to understand what all of the connections mean in order to understand the changes that are occurring. Doing so allows IK holders to observe and assess the environment holistically, to be able to identify where interconnections lie, and to monitor for cumulative impacts. These concepts are important to grasp before establishing a monitoring program that is meant to increase opportunities for gaining a higher understanding of what changes are occurring within the Arctic.

Today there are many CBM projects underway throughout the Arctic. However, there is a lack of knowledge about the number and location of these projects. To address this challenge the CBM Atlas (Johnson et al. 2015) was developed. This web-based atlas was created to provide a searchable inventory of CBM projects on the internet, and to undertake a comprehensive review of CBM practices in the circumpolar Arctic, using examples from the web atlas (www.arcticcbm.org). This work also discusses definitions and provides a gaps analysis and recommendations.

RECOMMENDATIONS FOR SUSTAINED OBSERVATIONS

In developing effective CBM programs it is important to bridge knowledge systems, to leverage existing IK networks, institutions and organizations, and to develop education strategies to broaden mutual understanding. This section provides some of the recommendations for advancing sustained observing systems from the white papers, issue statements, reviewers, and TWG members.

Capacity Building and Education:

Capacity building is an important part of research activities; one that may or may not be specifically required by communities, local/regional governing bodies, or funders. In this discussion we are focusing on capacity building in relation to Indigenous communities involved in CBM-type research.

Capacity building is a critical aspect of research design and can involve activities such as (but not limited to) providing opportunities for community members to actively participate in research throughout its many phases as participants, co-investigators, students, or in other roles, to receive training and have opportunities to use, prepare, distribute and implement results. Any training provided should also come with a certification acknowledging the training/capacity that has been gained. Capacity building also involves sharing data and products with communities that contributed it; this ensures that all interested community members have a chance to increase their knowledge on a particular topic, which builds overall community capacity to respond to specific events, requests, goals, etc. Capacity building may take other forms, as well, such as contributions of research products to local schools (that present information at the appropriate level, so that they are of use), funding for student participation in research or research-related activities, compensation to local/regional councils for reviewing and commenting on proposals, products or other materials, travel funding for community members to attend professional, public or other meetings related to research activities, and similar things.

Capacity building should be viewed as a long-term and collaborative process. For example, a one-time local hire on an observing project may indeed build capacity in the hired individual, but if future related employment opportunities or other ways of using the acquired knowledge and skills are not available, the capacity is short-lived and overall is less beneficial. Capacity building goals should also be developed by research leads in collaboration with tribal/community councils or other governing bodies. Researchers and institutions should not assume that they know capacity-related gaps or needs of a community or group. Community leaders will know best what their members are interested in. It is very important that researchers and communities develop long-term relationships and that they trust each other.

While the specific outcomes of capacity building activities should be determined by and in collaboration with communities, the overall goals of capacity building are to increase the ability of a group to identify, evaluate and address issues of interest and concern effectively. In terms of observing programs this may include developing the capacity to, for example:

- Identify environmental and climatological issues of concern
- Participate in the evaluation of those issues and determination of how they are currently affecting and are predicted to affect a community
- Addressing those issues through various venues; policy-based, management-based, or through other means

The issue of capacity building is intimately related to environmental justice, which we turn to next.

Environmental Justice:

The United States Environmental Protection Agency has defined environmental justice as, “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (EPA n.d.).

Additionally, the United Nations has discussed environmental justice as “a mechanism of accountability for the protection of rights and the prevention and punishment of wrongs related to the disproportionate impacts of growth on the poor and vulnerable in society from rising pollution and degradation of ecosystem services, and from inequitable access to and benefits from the use of natural assets and extractive resources” (UNDP 2014:5).

When environmental justice exists, communities are being treated equitably and have meaningful and timely involvement in processes that impact environmental and human health. This means that communities are informed, engaged and have power and control.

Indigenous communities in the Arctic are experiencing grave environmental *injustices*. They are being impacted by forces originating from far outside their communities, including greenhouse gas emissions, development projects, military and other hazardous waste dumps, pollutants in the air and water, poor management decisions made by distant bodies, lack of consultation in decision making, dismissal of indigenous concerns, and other forces. Free, prior and informed consent is rarely obtained from Indigenous communities. The cumulative impacts of these forces on communities, in addition to their disadvantaged status in multiple regards (financial, political, etc.), has led to such environmental injustice. Our current challenge is how to address and remedy these injustices.

In order to achieve a state of environmental justice, communities must be empowered and engaged. Capacity building, as described above, provides many opportunities to address environmental injustice. Many of the issues of concern to communities today are also of concern to researchers, governments, the public, and others. As such, these issues are the focus of multiple research projects, including CBM and observing networks. Research organizations overseeing such work have an ethical obligation to ensure that they are aware of environmental justice issues in the communities they work with, how their research questions are related to environmental injustice issues, and to collaborate with communities to develop capacity building measures to help address these issues.

Co-production of knowledge:

In the process of increasing our understanding of the environment, whether based on science and/or the use of both IK: both IK holders and scientists need to be included in determining what information is gathered, what questions are asked, which methodologies are used and how the analyses of information collected will be conducted. This collaboration requires the respect of IK holders and respect for the knowledge by scientists. A part of this information-sharing collaborative could include the education about philosophies, cosmology and methodologies found within IK. A collaborative process also demands a move away from using science to validate IK or viewing IK only as a knowledge source to support science.

Bringing together IK holders with scientists, of various disciplines, is needed to obtain a holistic image of what is occurring within the Arctic (Ostertag et al.). This may be done through a co-production of knowledge approach. This approach brings together IK holders and scientists from the beginning to the end of a project/study – where IK and science together create new knowledge, respecting that IK is its own knowledge and should not be translated into science.

This approach is being recognized as important in developing adaptation policies and practices, for sustainability and to address biodiversity conservation. Moving forward there is a need to further explore and develop basic direction and principles to aid people in using co-production of knowledge approaches (Roue et al.).

QUESTIONS TO EXPLORE AND BUILD INTO RECOMMENDATIONS AT AOS 2016:

We believe there are some key points crucial to successful monitoring programs, regardless of the methodologies. We ask AOS 2016 participants to think about these in the context of the synthesis and invite participants to provide additional detail and specific examples that emulate these points. :

1. Inclusion of IK holders and community members in all aspects of project design, from inception of the research design process (including developing the research questions, determining monitoring methods, data collections and analysis) to the communication of results (including decision making about, and how and where information will be documented).

2. Appropriate levels of funding that ensure community participation. Whether community members are trained to use scientific equipment to take samples, or are documenting observations based on IK, funding is required to support these efforts.
3. Proper attribution to individuals and groups that contributed to the research effort (e.g. in reports, presentations, peer-reviewed articles, or other research products).
4. Development of information and data management plans that allow communities to have control over data storage, continuous access to information that is collected and any products derived from that information.
5. CBM projects should support local communities to address their own observing, monitoring, and decision making needs.

Rather than include a conclusion within this synthesis paper we pose questions that are derived from the discussion of the white papers submitted to the AOS Theme 6. We hope that the AOS 2016 participants will come to Fairbanks with thoughts and ideas that build upon the following questions:

- What steps need to be taken to encourage using science and IK through a holistic lens for CBM programs? (e.g., a food security lens, ICC-AK 2015)
- How do we operationalize information generated to inform decision making across all scales?
- What steps need to be taken to connect IK holders and community/regional organizations with scientists to establish CBM programs that take an approach of co-production of knowledge?
- What steps need to be taken to encourage and establish an approach for the co-production of knowledge?
- What needs to happen in order to mainstream an ethical understanding and use of IK?
- What steps need to be taken to develop regional research Internal Review Boards?

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