Why Arctic Community Research Readiness and Priorities Matter

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Introduction

The Arctic Observing Summit 2018 focuses on the business case for a comprehensive pan-Arctic observing system that in part demonstrates the benefits for society at various levels, especially for those who call the Arctic their home(land). In this paper we bring our experiences in working with indigenous communities and community knowledge networks to highlight what we have identified are essential steps in ensuring that societal benefits of research and monitoring are accessed and embraced by Arctic communities, while developing a strong business case that promotes sustainability.

We emphasize that our experience primarily lies in direct collaborations with indigenous communities in Inuit Nunangat (Canada) and through network linkages to communities elsewhere in the circumpolar Inuit homeland. Our experience of engagement with community-based researchers has revealed a strong desire "to turn research inside out" by placing more focus and effort on research priorities that are important to communities and working with experts on addressing them (Bell 2016; Forbes et al. 2017). Such an approach, we argue below, would empower communities with tools and resources to determine their own research agendas and be capable (ready) to pursue research and monitoring collaborations for their own benefit. SmartICE, as a sea-ice monitoring and information service for communities by communities, is presented as an example of how a social enterprise business model may be both community directed and economically sustainable for pan-Arctic community-based observing systems.

We explicitly acknowledge Inuit aspirations for advancing self-determination and governance in research in Inuit Nunangat, as outlined in the recent Inuit Tapiriit Kanatami *National Inuit Strategy on Research* (ITK 2018). This strategy clearly articulates how research, done the right way, can produce knowledge that meets the needs and priorities of Inuit communities, while creating social and economic equity for Inuit in

Canada. This right way is spelled out in actions across five priority areas: 1) Advance Inuit governance in research; 2) Enhance the ethical conduct of research; 3) Align funding with Inuit research priorities; 4) Ensure Inuit access, ownership, and control over data and information; and 5) Build capacity in Inuit Nunangat research.

Addressing Community-Defined Knowledge Gaps

It is widely acknowledged that co-designed and co-produced knowledge in the hands of decision-makers at appropriate levels is the key to successful adaptation and resilient communities. There is an urgent need for locally applicable, decision-relevant, social-environmental knowledge from multiple sources in coastal communities, regional or territorial governments in the Canadian Arctic, and other circumpolar jurisdictions. Traditional research practices are inadequate to address complex sustainability challenges, or to identify and target community-defined knowledge gaps and research priorities. There is a growing recognition of the need for a transdisciplinary approach, led by or fully engaged with a broad range of rights- and knowledge-holder groups in an iterative mutual-learning process, to identify and follow pathways to better futures (Forbes et al. 2016; Future Earth Coasts 2018).

Despite a growing number of promising initiatives, capacity for research and knowledge mobilization in most northern communities remains limited There are substantial opportunities to expand capacity by knowledge sharing between northern communities, with the support of networks such as CACCON (Circum-Arctic Coastal Communities KnOwledge Network – "Catch-On").

CACCON

As the Arctic regional engagement network of Future Earth Coasts, CACCON is collaborating with community knowledge hubs and promoting research empowerment and readiness as a key requirement to strengthen the resilience of coastal residents in a rapidly changing Arctic.

Through informal discussions with community members, other knowledge holders, research coordinators, and others over the past year, a former CACCON Coordinator Michelle Slaney prepared a draft framework on co-designing resilient Arctic coastal communities through research partnerships. This focused on co-design and co-production, identifying enablers and good practices. The intention is to use this as the basis for a co-produced document that extracts insights from success stories ("bright spots") and develops guidance for strategies to formulate and open up pathways to

more sustainable futures. This CACCON experience has informed and been informed by interaction with the global Coastal Futures initiative.

Coastal Futures initiative of Future Earth Coasts

Future Earth Coasts (a core project of Future Earth) has developed *Our Coastal Futures* as a globally coordinated but regionally or locally specific approach to:

- Enable regional stakeholders and institutions to develop a common understanding of their coasts and future prospects;
- Co-design robust strategies to chart desired coastal futures; and
- Co-produce innovative coastal sustainability initiatives and pathways to achieve those desired outcomes (Future Earth Coasts 2018).

The approach has a particular focus on local capacity building as the foundation for actionable strategies to advance the Sustainable Development Goals (United Nations 2017).

Our Coastal Futures seeks to foster new partnerships and opportunities for knowledge exchange in order to build shared understanding of the coastal social-ecological systems in which people live and of their trajectories, challenges, and opportunities. The aim is to enable governance bodies and stakeholders "to chart a course away from unsustainable practices toward desired [more] sustainable coastal futures, … to build the capability of the people and institutions that guide how we use coastal resources and sustain our coasts" (Future Earth Coasts 2018).

The need for new empowerment and capacity amongst stakeholder and governance communities is no less acute in the Arctic. Unparalleled warming trends, rapid loss of sea ice, and other environmental changes are assailing communities already challenged by a mix of social, economic, educational, and health constraints and tenuous transportation links. It is believed that a pan-Arctic engagement network such as CACCON can help lead to benefits for the safety and future security of indigenous and northern residents.

Research readiness and peer-to-peer capacity sharing

There is a wide divergence of capacity and research readiness in northern communities. Some major centres, such as Nuuk, Iqaluit, Cambridge Bay, Inuvik, or Barrow have research facilities (e.g. Nunavut Research Institute in Iqaluit, Aurora Research Institute in Inuvik) and institutional support and infrastructure for northern community-oriented research (e.g. Joint Secretariat, Inuvialuit Regional Corporation in Inuvik). Others are hard-pressed to find an office or a computer to support community knowledge management activities.

The CACCON vision is to prepare northern communities to embrace knowledge and research as a vehicle for economic development, while addressing important local priorities of sustainability and well-being. For many northern communities, the legacy of past research is largely one of exploitation, mistrust and fatigue. Northern indigenous residents are no longer interested in the old ways of doing research, which in many cases took advantage of their people, their knowledge, and their land to build academic reputations or satisfy government surveys (ITK 2018). Community members, from leaders to youth, want "to turn research inside out" by focusing knowledge acquisition (co-designed and co-produced research) on community priorities, collaborating with external experts as required to address their needs (e.g. ITK 2018).

In recent years, there has been a rapid expansion of interest and activity in community-based monitoring (CBM) in the Arctic. Residents, northern communities, researchers, and policy-makers have increasingly come to appreciate the strengths of CBM in local resolution and detail, potential for continuity, integration of traditional knowledge, capacity-building and relevance to community decision-making. The challenges, however, are to determine what knowledge is required to support local decision-making, where and how it can be sourced (including local traditional and purpose-developed knowledge), and how it can be made readily available when and as needed. It may be possible to overcome these challenges by enabling the community to select and pursue priorities for research and monitoring based on knowledge needs and gaps and to manage the information locally for ease of access by the community.

CACCON has proposed initiatives to develop and pilot a strategy to help communities become more research-ready. More specifically the aim is to promote, enable, and foster research as a driver of economic activity and a foundation for community well-being and sustainability. These principles are beginning to be recognized in Inuit-led research protocols (e.g. IRC, n.d.; ITK 2018). In a few places, staff resources are available at the regional level (e.g. Inuvialuit Settlement Region, Nunatsiavut) and locally, supported by research grants or other resources such as ELOKA (Exchange for Local Observations and Knowledge of the Arctic), in a few communities with a long tradition of community organization (e.g. Ittaq Heritage and Research Centre, Ilisaqsivik Sociey, in Clyde River, Nunavut, http://ittaq.ca/en; Jaypoody et al. 2017). CACCON inspired development of a northern-led community Facebook group addressing ice and breakup hazards, managed by the Joint Secretariat in Inuvik. Harnessing newly available social media in the Inuvialuit Settlement Region, with more than 550 members, this is empowering residents to share in the documentation and real-time hazard awareness of the breakup process in the Mackenzie Delta region (Whalen et al. 2017).

Critical components of research readiness in small Arctic community settings include:

- Community research space (a place to meet and work, with office resources);
- Employment and training of a full-time community research coordinator;
- Development and execution of a community research engagement strategy;
- An inventory of research support resources in the community;
- A database of local research projects and accessible data to support community decision-making;
- Establishment of community research priorities; and
- Convening a community-wide research group to pursue research priorities.

Experience shows that the presence of other community initiatives, such as Ikaarvik and Ilisaqsivik, combined with local champions, has resulted in locally-driven enhancement of research readiness where these are present, but the challenge is to enable advancement in communities without such strengths and benefits.

Once a community has begun to develop research readiness, we anticipate that it will have the resources and capacity to pursue its own research agenda (through community-based monitoring or other approaches), while actively participating in Arctic science projects that are relevant to the region. Such opportunities would also ensure the integration of Inuit Knowledge and Values (*Inuit Qaujimajatuqangit*) in research design, implementation and interpretation.

Community-Based Knowledge Mobilization – the SmartICE example

SmartICE responds to a community priority for information on sea ice conditions for safe travel (Safer 2016; Kintisch 2017). It is co-designed with Inuit and involves Inuit in all its operations with the intention to integrate, not replace, Inuit Knowledge about sea-ice environments. Through generation and dissemination of near real-time ice information to communities, SmartICE directly supports public safety (by informing travel decisions about ice hazards), food security (by augmenting Inuit Knowledge of sea ice conditions for hunting and harvesting), and health and well-being (by informing safe access to land and ice, which supports community physical and mental health programs) at a time of unprecedented and unpredictable sea-ice changes.

SmartICE fills a knowledge gap identified by communities and enables them to manage its operations as best suits their needs and local ice conditions. In Nunavut communities, for example, a sea-ice user group created by SmartICE is made up of elders, youth, experienced and young hunters, local outfitters, and representatives from the Hunters and Trappers Organization, the Search and Rescue committee, the Canadian Rangers,

Government of Nunavut Wildlife Division, and where applicable Parks Canada. The group directs SmartICE operators (local Inuit) when and where to survey and how the data should be disseminated to meet user needs. It has recommended the development of a SmartICE app to make available maps and data to tech-savvy younger generations who bring mobile devices with them on the ice, as well as the display of SmartICE information on a television screen in the local grocery store, where everyone comes to shop on a regular basis. The group also proposes new technology to develop and test and new/old data to be acquired/reclaimed – for example, Inuit knowledge of travel ice hazards – and made accessible to the community via the SmartICE data portal.

In response to increasing community demand for its services, SmartICE is expanding across the Arctic through the establishment of a northern social enterprise. Our choice of a social enterprise business model is consistent with Inuit societal values, such as caring for the environment (*Avatittinnik Kamatsiarniq***)** and community (*Pijitsirniq*) and being innovative and resourceful (*Qanuqtuurniq*). It also commits to maximizing social impact and creating positive community change, while applying an entrepreneurial approach to the delivery of sea-ice information services. Currently, SmartICE is operational in eight communities from Nunatsiavut to Nunavut, with another dozen or so from across Arctic Canada exploring start-up opportunities.

A business approach to CBM recognizes the commercial value of local data, not only for community decision-making but also for business development and sustainability, especially in a changing Arctic. Although SmartICE primarily informs safe travel for communities, its data also enable and support economic activities for communities and industries alike. Mining, shipping, fisheries, emergency response, national defence, and environmental monitoring are all carried out to some degree on or through landfast ice. Therefore more specific information on sea-ice conditions, especially during freeze-up and break-up, reduces operational risk and improves performance for these commercial and government activities. Consequently, a key pillar of the SmartICE sustainability plan is to service clients in both commercial and public sectors, in order to support communities.

Community-based tourism, such as floe-edge and marine coastal tours, illustrates the opportunity for a sustainable sea-ice monitoring service for Arctic communities. Unpredictable ice break-up at the floe edge or ice break-through in areas that in the past were normally safe to travel on represent risks to the tourism industry, for which travel safety is paramount for market confidence and growth, and predictable ice conditions are essential for smooth operation and profitability. SmartICE is working closely with tourism operators to demonstrate that investment in SmartICE services

makes sense for their industry in a changing Arctic climate, while at the same time keeping their communities safe.

Above and beyond the benefits of SmartICE for travel risk reduction, improved emergency management and climate change adaptation, we believe an important legacy of SmartICE will be to harness the vast potential of Inuit youth to engage in the knowledge economy through community-based ice monitoring, and inspire a new generation to embrace knowledge, technology, and research as a vehicle for economic development and well-being in their communities.

Recognizing Community Priorities in a Pan-Arctic Observing System

Although the primary beneficiaries of a research readiness agenda are communities themselves, we also recognize that pan-Arctic science initiatives and aspirations (e.g. a pan-Arctic observing system) will benefit from northern communities that are *research ready*. Inuit knowledge and perspectives, if not central to the subject matter, will certainly enrich the research process and perhaps expand the research scope. In many cases, community research priorities may share common themes with pan-Arctic observing systems (e.g. changing sea ice), but their rationale will be rooted in community well-being and sustainability. Accordingly, the community's research questions and sampling design will have a different emphasis, rooted in knowledge of the local environment and shaped by Inuit values and priorities.

Communities will benefit from knowing each others' knowledge gaps and needs, providing opportunities for shared expertise and training and networking of adaptation and sustainability solutions. As a northern network of community knowledge hubs, CACCON is well placed to facilitate this exchange of local experience and capacity. Territorial and national governments are also key stakeholders in a community *research readiness* strategy, because they may respond to shared priorities in a coordinated fashion, or design programs to better support common capacity needs.

Our vision is a *research readiness* strategy that empowers communities to develop the awareness, infrastructure, capacity and priorities for research, while actively pursuing collaborations that reflect Inuit values and share sustainability and well-being research goals. This will not only facilitate a meaningful pan-Arctic observing strategy, but also an Arctic-relevant pilot of the global coastal futures strategy of Future Earth Coasts. Guided by the global Sustainable Development Goals, the ultimate objective of this strategy is enhanced sustainability, health, safety, and well-being at regional, local, household, and individual scales. Enhanced research readiness is the platform on which broad collaboration to realize these goals can be founded.

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