

Changing the role of non-Indigenous research partners in practice to support Inuit self-determination in research¹

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Abstract: Efforts to date have not advanced Indigenous participation, capacity building and knowledge in Arctic environmental science in Canada because Arctic environmental science has yet to acknowledge, or truly practice decolonizing research. The expanding literature on decolonizing and Indigenous research provides guidance towards these alternative research approaches, but less has been written about how you do this in practice and the potential role for non-Indigenous research partners in supporting Inuit self-determination in research. This paper describes the decolonizing methodology of a non-Indigenous researcher partner and presents a co-developed approach, called the Sikumiut model, for Inuit and non-Indigenous researchers interested in supporting Inuit self-determination. In this model the roles of Inuit and non-Indigenous research partners were redefined, with Inuit governing the research and non-Indigenous research partners training and mentoring Inuit youth to conduct the research themselves. The Sikumiut model shows how having Inuit in decision-making positions ensured Inuit data ownership, accessibility, and control over how their Inuit Qaujimaqatuqangit is documented, communicated, and respected for its own scientific merit. It examines the benefits and potential to build on the existing research capacity of Inuit youth and describes the guidance and lessons learned from a non-Indigenous researcher in supporting Inuit self-determination in research.

Pinasuktaujuut maannamut pivaallirtittisimangimmata nunaqarqaarsimajunik ilautitaunin-ginnik, pijunnarsivallianirmik ammalu qaujimajaujunik ukiurtartumi avatilirinikkut kiklisiniarnikkut kanata pijjutigillugu ukiurtartumi avatilirinikkut kiklisiniarnikkut ilisarsisimangimmata, uvaluunniit piliringimmata issaktausimangittunik silataanit qaujisarnimut. Uqalimaagait issaktausimangittunik silataanit ammalu nunaqarqaarsimajut qaujisarningit piviqartittikmata tukimuagutaujunnarlutik asiagut qaujisarnikkut, kisiani titirartauqattanginnirsaukmat qanuq pilirigajarmangaata ammalu ilautitauningit nunaqarqaarsimangittut qaujisarnimut ikajurtuilutik Inuit nangmini qaujisaqattarnimut. Taanna titirarsimajuq uqausiqartuq issaktausimangillutik iliquisujumik nunaqarqaarsimangittut qaujisartiujut ammalu saqittillutik ikajurtigiiklutik pigiartittinirmik, taijaujuq

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sikumiut aturtanga, inungnut ammalu nunaqarqaarsimangittunut qaujisartinut pijumajunut ikajurtuilutik Inuit nangminiq qaujisarnirmut. Tavani aturtaujuumi piliriaksangit Inuit ammalu nunaqarqaarsimangittut qaujisartiujut tukisinarsititullutik, Inuit aulattillutik qaujisarnirmik ammalu nunaqarqaarsimangittut qausartit ilinniartitillutik ammalu pilimaksailutik makkuktunik inungnik nangminiq qaujisarunnarniarmata. Sikumiunut aturtaujuq takusaujuq qanuq Inuit aaqiksuijuullutik Inuit pisimajuniarlutik tinngirartaujunik, takujaujunnarningit ammalu aulatauningit qanuq inuit qaujimatatuqangit titirartaukmangaata, tusaumajjutaukmangaata ammaluikpigijaulutik kiklisiniarnikkut atuutiqarninginnik. Takunangniujuq pivaalliutaujunnartunik ammalu pirurpalliagajartunik maanna qaujisarniujumik pijunnarsiqullugit makkuktut Inuit ammalu uqausiulluni tukimuagutaujunnartut ammalu ilitausimajut nunaqarqaarsimangittunit qausartinit ikajurtuilutik inuit nangminiq qaujisarnirmut.

Key words: Indigenous research, Inuit Qaujimatatuqangit, Inuit self-determination in research, decolonizing research, relational accountability. Nunaqarqaarsimajut qaujisarningit, Inuit Qaujimatatuqangit, Inuit nangminiq pigiartitillutik qaujisarniq, asinginningaangittunik asirurtausimangittunik qaujisarniq, aktuanginga qaujisarniq qaujisartinut nunaliknuarsivallianinga.

Résumé : Les efforts déployés jusqu'à maintenant n'ont pas fait progresser la participation, le développement des compétences et le savoir des Autochtones dans le domaine des sciences environnementales de l'Arctique au Canada, car au niveau des sciences environnementales de l'Arctique la décolonisation de la recherche n'a pas encore été reconnue ou vraiment mise en pratique. La documentation de plus en plus abondante sur la décolonisation et la recherche autochtone renseigne sur ces approches de recherche de rechange, mais il existe moins d'information sur la façon dont ceci a été fait dans la pratique et le rôle potentiel des partenaires de recherche non autochtones pour soutenir l'autodétermination des Inuits dans le domaine de la recherche. Ce document décrit la méthodologie de décolonisation d'un partenaire de recherche non autochtone et présente une approche élaborée conjointement, appelée modèle Sikumiut, pour les chercheurs Inuits et non autochtones intéressés à appuyer l'autodétermination des Inuits. Dans ce modèle, les rôles des partenaires de recherche Inuits et non autochtones ont été redéfinis, les Inuits gouvernant la recherche et les partenaires de recherche non autochtones formant et encadrant les jeunes Inuits pour mener eux-mêmes la recherche. Le modèle Sikumiut montre comment le fait que les Inuits occupent des postes décisionnels assure la propriété et l'accessibilité des données inuites et le contrôle sur la façon dont leur Inuit Qaujimatatuqangit est documenté, communiqué et respecté pour sa propre valeur scientifique. Le modèle examine les avantages et les possibilités de tirer parti des compétences de recherche actuelle des jeunes Inuits et décrit les conseils et les leçons tirés d'un chercheur non autochtone pour appuyer l'autodétermination des Inuits en recherche. [Traduit par la Rédaction]

Mots-clés : recherche autochtone, Inuit Qaujimatatuqangit (connaissances traditionnelles des Inuits), autodétermination des Inuits dans le domaine de la recherche, décolonisation de la recherche, responsabilité relationnelle.

Introduction

Although Canadian Arctic research programs have developed policies to increase Indigenous participation, capacity building and Indigenous knowledge in Arctic science, Arctic research continues to mostly benefit non-Indigenous researchers, not Indigenous peoples and their communities (Brunet et al. 2014, 2016; ITK 2016a). Indigenous participation has not improved in Arctic environmental science because it has yet to acknowledge how colonialism continues to impact Inuit and contemporary research approaches (Cameron 2012), or truly practice decolonizing research. As a result, universities and research funding programs continue to conduct Arctic environmental research from conventional, western research perspectives (Wilson 2008; Kovach 2009; Smith 2012a, 2012b; McGrath 2018). However, Inuit are making significant advancements to change the status

quo, as demonstrated by the release of the National Inuit Strategy on Research (NISR) to advance Inuit self-determination in research (ITK 2018a).

The expanding literature on decolonizing and Indigenous research provides guidance and principles towards changing current research approaches with Indigenous peoples, but less has been written about how you do this in practice (Morton Ninomiya and Pollock 2017; Gerlach 2018). There are also very few examples that illustrate the potential role for non-Indigenous research partners (Kovach 2009; Gaudry 2015). As the concept of decolonizing research is still in its infancy in Arctic environmental science, there is even less advice for Arctic research funders and non-Indigenous researchers in how to change their current approaches to support Inuit self-determination in research.

The purpose of this paper is to present a decolonizing research methodology for non-Indigenous researchers and a co-developed research model from the community of Mittimatalik (Pond Inlet), Nunavut to support Inuit self-determination in research. This research paper adds to the growing decolonizing research literature by providing Inuit and non-Indigenous researchers with a practical example in which the roles of Inuit and non-Indigenous research partners were redefined.

The first section, *Positioning myself*, provides a personal introduction so readers can understand the positionality of the first author in the research and the authorship of this paper. The next section, *A decolonizing methodology for the non-Indigenous researcher*, outlines the methodology used in efforts to decolonize oneself in preparation for — and throughout — the research process. *From guidance to practice: the Sikumiut model* describes how the research relationship was co-developed. Sikumiut, which means “people of the sea ice” in Inuktitut, is the self-titled name of the 10-person committee that governs SmartICE, a community-based sea-ice monitoring program (see www.SmartICE.org) in Mittimatalik. Through multiple visits to the community to build trust, establish SmartICE and practice decolonizing research approaches, a research relationship was developed. The Sikumiut model describes how Inuit are governing this research, non-Indigenous research partners are training and mentoring Inuit youth, and Inuit youth are conducting the research to address the community’s research needs. In the *Discussion* section the fundamental NISR priority of having Inuit in decision-making positions is emphasized as critical for achieving Inuit self-determination in research. Many learning experiences arose in developing the Sikumiut model and are related to securing data ownership, accessibility, and control over how Inuit Qaujimagatuqangit is documented, communicated and respected for its own scientific merit. The benefits, challenges and potential to build on the existing research capacity of Inuit youth are also discussed. To close, reflections and lessons learned are provided from the perspective of a non-Indigenous researcher in decolonizing oneself, and in practicing decolonizing research to support the greater goal of Inuit self-determination in research.

Positioning myself

I (Katherine Wilson) am a Federal Government employee that has been involved in Arctic science since 1995. I have been employed with the Canadian Ice Service (CIS), part of the Meteorological Service of Canada, Environment and Climate Change Canada for 15 years (1995–2008, and 2015–present). During the first decade of my career I was the typical researcher that flew into field camps and worked on and off ships without ever having a conversation with a member of the nearby Inuit community. It was in the early 2000s when my perspectives started to change based on PhD research by Fox (2004) and Laidler (2007). These women were working *with* Inuit to learn about the impacts of climate change on sea-ice while deeply respecting Inuit and their knowledge. Between 2008 and 2015, I worked

in the department formerly known as Indian and Northern Affairs (INAC) in coordinating calls for proposals for several Arctic research funding programs (International Polar Year, the Arctic Research Infrastructure Fund, the Northern Contaminants Program, and the Canadian High Arctic Research Station). During this time at INAC I was able to travel across the Canadian Arctic, work with Indigenous organizations, develop relationships, and begin to understand more about Inuit culture and worldviews. I also witnessed and contributed to many efforts to improve Inuit participation, capacity building and knowledge in Arctic science. During my time at INAC, one research project that caught my attention was SmartICE. Originally out of Memorial University, Newfoundland, SmartICE was doing research differently and I was inspired by this Inuit-led community-based sea-ice monitoring program (in 2017 SmartICE was incorporated as a not-for-profit, northern social enterprise). In 2015, I went back to school full-time to work on my PhD at Memorial University so I could become part of the SmartICE team and learn more about working with Inuit and their research needs. The 2018 release of *Inuit Tapiriit Kanatami* (ITK)'s National Inuit Strategy on Research (NISR) was a further motivation to explore how non-Indigenous researchers can contribute to the larger goals of social change (Wyborn et al. 2019) in supporting Inuit self-determination in research.

As first author, I have written this paper based on my personal experiences as a non-Indigenous person and as a result, a majority of this paper is written in the first person. Sikumiut members have endorsed the writing and publishing of this paper (Bell and Arreak 2019). Andrew Arreak, Brian Koonoo and David Angnatsiak contributed to the manuscript through the review, editing and approval of the *Sikumiut model* and *Discussion* sections. This paper has been intentionally written in a plain language format for accessibility and ease of translation. Trevor Bell and Gita Ljubicic my graduate supervisors and additional co-authors have been ever present on my research journey. Their roles in this paper were in editing, helping me to articulate, and become mindful of the decolonization in the research and myself.

A decolonizing methodology for the non-Indigenous researcher

The review of the literature started with the goal of understanding if there was support and advice for non-Indigenous researchers as methodological guidance in advance of the research. Some Indigenous scholars recognize that particular non-Indigenous researchers have a “genuine desire to support the cause” (Smith 2012a, p. 186) and Kovach (2009, p. 11) believes that there is a new generation “seeking ways to understand the world without harming it”. Smith (2012a) and Louis (2007) discuss that excluding non-Indigenous researchers would only perpetuate Indigenous research as some sort of cultural privilege, when it's an opportunity for non-Indigenous researchers to develop “the tools they need to ensure that their research agendas are ‘sympathetic, respectful, and ethical from an Indigenous perspective’” (Louis 2007, p. 134).

To begin “decolonizing one’s mind and heart” (Kovach 2009, p. 169), non-Indigenous researchers need to begin the “self-education process” well in advance of the research (Gaudry 2015, p. 259). The five sections that follow provide a summary from the literature that I utilized as initial guidance and advice to develop a process and a methodology in decolonizing myself. In this paper, the term *Indigenous* will refer to Indigenous research collectively. The term *Inuit* will be used when specifically discussing research in Inuit Nunangat, “the distinct geographic, political, and cultural region that includes the Inuvialuit Settlement Region (Northwest Territories), Nunavut, Nunavik (Northern Quebec), and Nunatsiavut (Northern Labrador)” (ITK 2018b, p. 18). The term non-Indigenous will refer to research partners coming from outside of Indigenous cultures.

Learn more about the colonialism of Inuit in Canada

As a non-Indigenous researcher I needed to educate myself further about the colonial history of Indigenous peoples and the resulting and continuing trauma. For the North American Inuit, the influence of colonialism started in the 17th century, when whalers, explorers, missionaries and Hudson's Bay Company fur traders first came to the Canadian Arctic (ITK 2006). However, it was during the Cold War era of the 1950s when Inuit were forced to settle in communities as part of the Government of Canada's assimilation approach called the "in-gathering policy" (MacDonald 2018), and some communities were relocated into the High Arctic to further Canadian Arctic sovereignty (CBC 2010; Qikiqtani Inuit Association 2014). As part of the Canadian government settlement and assimilation process, Inuit children were required to attend school and sent away to residential schools. For an Inuit-specific understanding on the impact of colonialism in Canada, the "Final Report of the Truth and Reconciliation Commission of Canada Commission report Volume 2: Canada's Residential Schools: The Inuit and Northern Experience" (TRC 2015), and Chapter 4: Colonization as Gendered Oppression and specifically the sub-section entitled "Colonial Encounter: Distinctive Inuit Experiences" (MMIWG 2019) are excellent resources.

The term post-colonial is often used to describe the current state of affairs, but many Indigenous scholars argue that this infers that "colonialism no longer exists" (Smith 2012a, p. 25). Colonialism in the Canadian context is described as settler colonialism, in which people from other countries invaded, settled and established sovereign power (Barker and Battell Lowman 2016). Settler colonialism is an ongoing process that continues to structure and shape relations between Indigenous peoples and settlers (Wolfe 2006; Tuck and Yang 2012; Veracini 2013). Castleden et al. (2012) and Simpson (2004) both argue that external colonial control through ongoing federal government policies and practices continues to marginalize Indigenous peoples in Canada. Price (2007) and McGrath (2018) argue that colonialism continues to systematically and symbolically undermine and devalue the Inuit cultural systems that once made them self-sufficient.

Learn about decolonizing and Indigenous research approaches

Self-education also requires learning the history and underlying colonial philosophies of western research. Smith (2012a, 2012b), Wilson (2008) and Kovach (2009) are outstanding resources to understand the foundations of western research beliefs and biases, and how these approaches continue to treat Indigenous peoples as passive subjects to study and collect data from (Smith 2012a; Gaudry 2015). Decolonizing research approaches critically assess and challenge western research production and power throughout the process, from the beliefs and philosophies used to design and frame the questions and methods, to the execution, analysis, and communication of results (Kovach 2009; Smith 2012a; Coombes et al. 2014). It questions why western research continues to dominate contemporary knowledge production and why it is considered the only way to conduct a scientific inquiry (Smith 2012a; Tuck and Yang 2012).

Indigenous research methodologies are inherently decolonizing methodologies that aim to serve multiple purposes (Castleden et al. 2012; Grimwood et al. 2012; Smith 2012a, 2012b; Coombes et al. 2014). Indigenous peoples want to conduct their own research, in their own way, in their own words, under their terms, and for their own purposes (Louis 2007; Wilson 2008; Kovach 2009; Smith 2012a; Dei 2013; Gaudry 2015). They want to re-assert their knowledge, worldviews and shift the unequal power dynamic by developing and revitalizing their own capacity (Kovach 2009; Smith 2012a; Dei 2013). Indigenous research is political, it is about social justice, self-determination, reconciliation, education and sovereignty (Smith 2012a; Tuck and Yang 2012). It is also about

changing the academy so it recognizes how Indigenous people “make and create knowledge” (Dei 2013, p. 30).

Wilson (2008) describes western research as being predominantly individual, whereas Indigenous research belongs to the community and the universe, in which they are a part. Indigenous scholars agree that Indigenous research methodologies are all based on the principle of relational accountability (Wilson 2008; Kovach 2009; Stewart-Harawira 2013; Healey and Tagak 2014; McGrath 2018). Relational accountability means that giving back to their community and being accountable to their relationships in the community are what guide their research. Because Indigenous research is relational, it is “the process [that] is far more important than the outcomes” (Smith 2012a, p. xi). Relationality is the major difference between western and Indigenous research approaches (Wilson 2008).

Understand why Indigenous knowledge is different

There is no one-size-fits-all Indigenous research approach because Indigenous knowledge systems are connected to the specific cultural values and practices that have evolved from particular environments and geographic contexts (Louis 2007; Wilson 2008; Koster et al. 2012). The term Indigenous knowledge is becoming more widely utilized due to concerns that the term “traditional knowledge” may give the impression that this knowledge is no longer relevant, when it is constantly evolving (ICC-Alaska 2015). Inuit Qaujimagatuqangit (IQ) is commonly used to describe Inuit knowledge; however, IQ encompasses so much more than knowledge. IQ “embraces all aspects of traditional Inuit culture, including values, world-view, language, social organization, knowledge, life skills, perceptions and expectations” (Nunavut Department of Education 2007, p. 22). See also the interview with McGrath in Canadian Polar Commission (2003) and Tester and Irniq (2008) for a more in-depth description. Through the remainder of this paper I will use Indigenous knowledge to refer to the collective Indigenous knowledge systems and IQ when referring specifically to Inuit knowledge.

Indigenous knowledge has not always been considered “scientific” enough by western research to stand on its own merit (Ellis 2005; Bravo 2009a; ITK 2016a). There are also concerns about the integration of Indigenous knowledge “into” western science (Agrawal 1995; Nadasdy 1999; Ellis 2005; Bohensky and Maru 2011; McGrath 2018). It is ultimately the western researcher who decides what Indigenous knowledge is relevant, often stripping out the philosophical foundations and values (Simpson 2004) for that which supports and validates western science (Bravo 2009b; ITK 2016a). Indigenous scholars agree there is a fundamental difference between Indigenous and western knowledge (Price 2007; Wilson 2008; Kovach 2009; Smith 2012a). Because Indigenous knowledge is so interconnected, highly contextual, and philosophically different than western knowledge, Indigenous knowledge cannot be extracted from its relational context as is done in western science (Wilson 2008; Dei 2013; Gaudry 2015). As a result, Indigenous organizations are no longer advocating for “incorporating” or “integrating” Indigenous knowledge but for its recognition based on its own scientific merit (Price 2007; Cochran et al. 2013; Healey and Tagak 2014; ICC-Alaska 2015; McGrath 2018) and its inclusion as a distinct knowledge system (ITK 2016a; Yukon Government 2016). Indigenous organizations and scholars continue to advocate for the inclusion of Indigenous knowledge as an important process to reclaim their sovereignty in research (Simpson 2004; ITK 2016a; Yukon Government 2016).

Learn about decolonizing research in Inuit Nunangat

Programs that support Canadian Arctic research, such as ArcticNet, the Tri-Councils, the Northern Contaminants Program, and Polar Knowledge Canada, have all developed policies over the years to increase Indigenous participation, capacity building, and Indigenous knowledge consideration in Arctic environmental science. However, this continues to mostly benefit non-Indigenous researchers, not Indigenous peoples and their communities (Brunet et al. 2014, 2016; ITK 2016a). I conducted a more recent review of the Arctic environmental science literature between the years 2000 and 2018 to understand the level of decolonizing research now taking place in Inuit Nunangat. Using the Scopus journal database, articles were searched based on key words to:

- identify relevant Arctic environmental science research (“Arctic” AND “Inuit” OR “Inuvialuit” OR “Nunavut” OR “Nunavik” OR “Nunatsiavut” AND “community-based” OR “participatory” OR “participation” OR “action” OR “co-produced” OR “co-production” OR “collaborative” OR “collaboratively” OR “collaborated”) and
- in combination with indicators of alternative, decolonizing methodologies (“decoloni(s)zing” OR “decoloni(s)zation” OR “colonial” OR coloni(s)zation”).

From this search, 53 relevant Arctic environmental science articles were identified. Of these, 35 articles (66%) discussed the use of alternative research approaches; however, only 18 articles (34%) acknowledged colonialism or mentioned that these alternative approaches supported decolonizing research. Cameron (2012, p. 104), in her review of the Arctic climate change adaptation literature, also found that “Colonialism fails to appear as a word or concept in these studies, in spite of the fact that the projects are carried out in communities that are profoundly shaped by colonization”. A majority of the articles that suggest they are working with Inuit tended to borrow from these alternative methodologies without appearing to understand, practice, or discuss the decolonizing aspects of these methodologies.

The release of ITK’s NISR highlights how past and current research policies continue to fail in supporting Inuit self-reliance (ITK 2018b). Although ITK recognizes the need for research, it questions its significance when Inuit are not involved, their research needs are not prioritized, and the results are not relevant to their lives (ITK 2016b, 2018b). Inuit are now creating their own research spaces and initiatives such as the Kitikmeot Heritage Society (2019), Ittaq Heritage and Research Centre (2019), Qaujigiartiit Health Research Centre (2019), and Aqqiumavvik Society (2019). Inuit-specific research approaches, such as *Piliriqatigiinni* (Healey and Tagak 2014), *Tukisivallialiqtakka* (Price 2007), the *Qaggiq Model* (McGrath 2018) and the Alaskan Inuit food security conceptual framework (ICC-Alaska 2015), are all examples of emerging methodologies aimed to reclaim Inuit-specific research approaches. Compared with the broader Indigenous research approaches, these Inuit-specific approaches all share four important aspects:

- Inuit research is grounded in relational accountability according to Inuit cultural norms and values;
- Inuit research approaches need to be revitalized in a modern context due to the ongoing effects of colonialism;
- Inuit research is a process towards decolonization and self-determination, in reclaiming Inuit ways and decision-making power; and
- IQ is a distinct system, it is fundamentally and philosophically unique, it cannot be integrated into western science, and must be recognized on its own merit.

ITK (2016a) has advocated that Inuit-specific research is a fundamental need both for Inuit self-determination, their quality of life, and as rights-holders under Inuit land claims. The NISR discusses the following five priority policy areas to advance Inuit self-determination in research (ITK 2018b, p. 6):

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.

Re-examine and re-learn your approach to research

Through the process of decolonizing myself, I began to re-examine my own personal history, family, and how I was educated. This process is called reflexivity, a very personal process of critical reflection that is a necessary part of decolonizing oneself (Kovach 2009). It is through the process of reflexivity that non-Indigenous researchers can begin to understand and acknowledge their biases throughout the research process to be transparent, continuously aware, and to re-examine how their biases affect their intentions, assumptions, decisions and reactions (Kovach 2009; Grimwood et al. 2012; Sandoval et al. 2016).

In educating oneself about relational accountability, scholars have explored the questions of whether non-Indigenous researchers can learn how to be relational or support relational approaches (Kovach 2009; Morton Ninomiya and Pollock 2017) to ensure authentic and ethical relationships with Indigenous people (Bull 2010; Fletcher et al. 2016). There is an emerging group of non-Indigenous researchers aiming to further decolonize their approaches by grounding their research with Indigenous peoples in relational accountability (Oberndorfer 2016; Gerlach 2018). Gerlach (2018) and Oberndorfer (2016) outline how relationality influenced their motives, actions, and reflexivity. Oberndorfer (2016, p. 5), in a community-based research project with Inuit in Makkovik, Nunatsiavut, discusses how relationality helped her to see “plants not as objects, but in the context of relationships: with people, with cultural practices, with animals, with weather, with soils, and with space and time”. Gerlach (2018, p. 5) reflexively discusses how relationality changed her approaches to create the necessary time needed to prioritize relationships, to learn from them rather than about them, about being humble and moving away from “researcher as expert knower” toward “researcher as learner”.

The decolonizing journey is an essential and ongoing part of the research methodologies and methods for non-Indigenous researchers. Educating oneself about the colonialism of Indigenous peoples in Canada, the differences between western research, and decolonizing and Indigenous research approaches are necessary first steps in decolonizing oneself. Understanding that relational accountability is the foundation of Indigenous research can further situate and guide non-Indigenous researchers towards prioritizing relationships in their research. As Beeman-Cadwallader et al. (2012, p. 7) describes “it is the intent or mindfulness” that develops through educating yourself and your reflections that will make your research decolonizing.

From guidance to practice: the Sikumiut model

My decolonizing process did not simply involve reading the decolonizing literature but included the invaluable experience of multiple trips to the community to practice decolonizing research. Mary Ellen Thomas, Senior Science Advisor for Nunavut, once told me “people don’t really pay attention to you until at least the third visit” (M. Thomas, personal communication, 20 November 2015). Utilizing the decolonizing advice from the literature

and from others such as Mary Ellen with long-term experience in northern research, my planned approach was to take the necessary time to develop relationships, build trust, understand the community-specific context, and assess the community need or desire to co-develop research. What has evolved from this co-development over many visits to Mittimatalik (Table 1) is *The Sikumiut model*, which adopts the values and priorities of Sikumiut while respecting and enhancing Inuit self-determination in research.

Ikaarvik (which translates to “bridge” in Inuktitut) is a community-based group from Mittimatalik that believes research can be a tool for strengthening Northern communities, and a means for Inuit youth to become engaged and empowered to deal with environmental and social change in the Arctic (Elverum et al. 2017). Ikaarvik held workshops in Mittimatalik in 2013 with Inuit youth to discuss their community research priorities. These Inuit youth were then trained to hold workshops with the broader community to further develop and validate community-wide research priorities. Concerns around changing sea-ice and safe travel on the ice were high on the list of the community’s research priorities.

Ikaarvik then sought out meaningful partnerships with outside researchers to help address these community research priorities. In November of 2015 Ikaarvik invited one of my PhD research advisors and SmartICE principal investigator, Trevor Bell, to Mittimatalik (Table 1). Ikaarvik had heard about SmartICE, a community-driven local sea-ice information service for Inuit. SmartICE uses a combination of stationary and mobile sensors to monitor ice thickness and temperature, and satellite images to support Inuit sea-ice travel (Bell et al. 2014). Co-developed with the Nunatsiavut Government, SmartICE information supports local climate change adaptation decision-making so Inuit can continue to rely on sea-ice transportation for hunting and fishing, and to maintain their nutritional and cultural wellness. Ikaarvik facilitated a wide range of community meetings with SmartICE to discuss if establishing this sea-ice monitoring system in Mittimatalik would be useful in addressing some of the community’s concerns about sea-ice travel safety. The feedback from this initial visit was positive, and in May 2016, SmartICE hired Ikaarvik youth to help prepare for a larger community open house (Table 1). The youth helped SmartICE frame the discussion questions and provided feedback on the presentation to ensure it was communicated in accessible and culturally appropriate ways. Ikaarvik youth also facilitated break-out groups to gain feedback on how SmartICE should operate in Mittimatalik. Working with the Ikaarvik youth was my first step in developing relationships in the community. Ikaarvik provided a safe place for me to get feedback, ask questions, and get honest answers about cultural protocols before engaging with the broader community.

It was during the May 2016 community open house that an Inuit sea-ice expert committee was recommended to evaluate and communicate the SmartICE monitoring information to the community. In November 2016, SmartICE met individually with suggested Inuit sea-ice experts and requested recommendations for additional members (Table 1). A meeting was held to introduce SmartICE and gauge interest in joining the Inuit sea-ice expert committee. During this meeting the membership was discussed, and terms of reference were drafted to formalize their roles, responsibilities, and honoraria. It became clear during this initial meeting that the sea-ice expert committee was not just about communications, it was about Inuit taking control to manage and be the decision-makers for SmartICE in Mittimatalik.

The Inuit management committee named themselves Sikumiut, which means “people of the ice” in Inuktitut. In February 2017, the Sikumiut management committee had their first formal meeting to review and approve their terms of reference and begin planning the SmartICE monitoring activities (Table 1). The Sikumiut 10-person committee includes Inuit men and women representing: Elders; Ikaarvik; Search and Rescue; Parks Canada,

Table 1. Details of visits to Mittimatalik in co-developing research.

No.	Date	Purpose/activities	Research team members involved	Outcomes
1	November 2015	<ul style="list-style-type: none"> • SmartICE invited to Mittimatalik by Ikaarvik to explore possible research relationship • Meetings with Hamlet Council, Hunters and Trappers Association, Parks Canada, Search and Rescue volunteers, GN Wildlife, Ikaarvik community researchers 	<ul style="list-style-type: none"> • Trevor Bell, (Memorial University of Newfoundland (MUN)) • Katherine Wilson (MUN and Canadian Ice Service (CIS)) • Leah Braithwaite (CIS) • Andrew Arreak (SmartICE) • Shelly Elverum (Ikaarvik) 	<ul style="list-style-type: none"> • General interest in SmartICE • Invited back to continue discussions on how SmartICE should operate in Mittimatalik • Hiring of SmartICE community coordinator in Mittimatalik
2	May 2016	<ul style="list-style-type: none"> • SmartICE community consultation with SmartICE partners from Nunatsiavut • Meetings with Hamlet Council, Hunters and Trappers Association, Parks Canada, Search and Rescue volunteers, GN Wildlife, Pond Inlet Archives, and Ikaarvik • Community open house 	<ul style="list-style-type: none"> • Trevor Bell (MUN) • Katherine Wilson (MUN/CIS) • Rodd Laing (Nunatsiavut Government) • Joey Angnatok (Nunatsiavut Government) • Andrew Arreak (SmartICE) • Shelly Elverum (Ikaarvik) 	<ul style="list-style-type: none"> • Approval by Hamlet Council for SmartICE to operate in the community of Mittimatalik • Feedback from Community Open House on how SmartICE should operate, recommending an Inuit sea-ice expert committee
3	November 2016	<ul style="list-style-type: none"> • Meetings with individuals recommended for the SmartICE Inuit Management Committee and recommendations for additional members • Update to Hamlet Council • Review historical sea-ice research at the Pond Inlet Archives 	<ul style="list-style-type: none"> • Trevor Bell (MUN) • Katherine Wilson (MUN/CIS) • Andrew Arreak (SmartICE) • Shelly Elverum (Ikaarvik) 	<ul style="list-style-type: none"> • Initial Sikumiut meeting. • Draft terms of reference for committee
4	January 2017	<ul style="list-style-type: none"> • Meeting with Ikaarvik youth to ask questions about IQ and Inuit Societal Values • First Sikumiut meeting to formalize name and terms of reference 	<ul style="list-style-type: none"> • Trevor Bell (MUN) • Katherine Wilson (MUN/CIS) • Andrew Arreak (SmartICE) • Shelly Elverum (Ikaarvik) • Tom Zagon (CIS) • Adrienne Tivy (CIS) • Rob Briggs (C-Core) • Steve Baillie (Nunavut Emergency Management) • Gita Ljubicic (Carleton University) 	<ul style="list-style-type: none"> • Final Sikumiut terms of reference in Inuktitut and English • Sikumiut meeting minutes in English and Inuktitut
5	September 2017	<ul style="list-style-type: none"> • Sikumiut meeting: <ul style="list-style-type: none"> - Discussion about Sikumiut's research needs • Update to Hamlet Council 	<ul style="list-style-type: none"> • Trevor Bell (MUN) • Katherine Wilson (MUN/CIS) • Andrew Arreak (SmartICE) • Shelly Elverum (Ikaarvik) 	<ul style="list-style-type: none"> • Sikumiut meeting minutes in English and Inuktitut • Approval of Sikumiut research needs

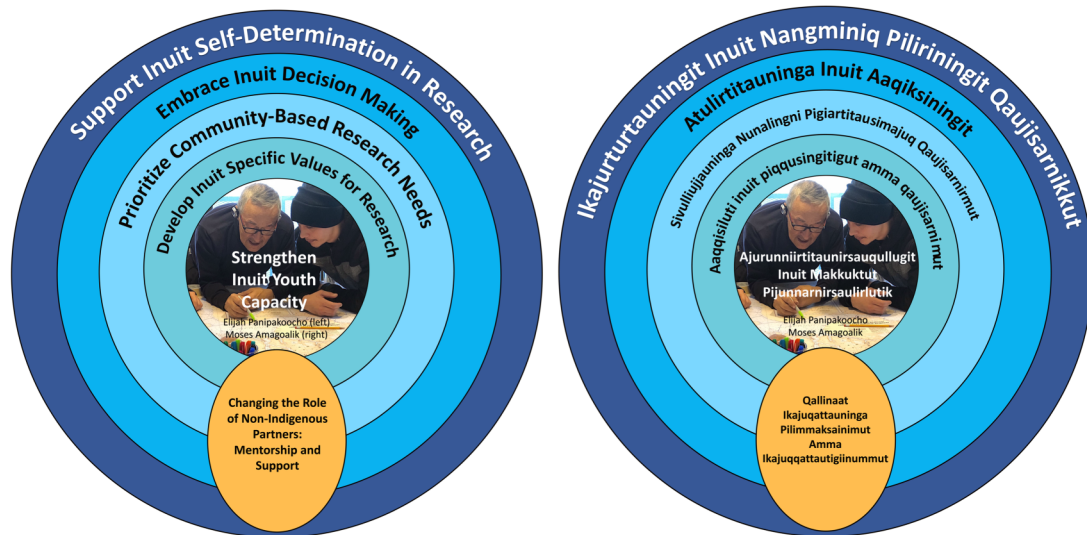
Table 1. (continued).

No.	Date	Purpose/activities	Research team members involved	Outcomes
6	March 2018	<ul style="list-style-type: none"> • Sikumiut meeting - Co-development of Sikumiut research project approach - Meet with potential youth researchers to discuss the project and gauge interest 	<ul style="list-style-type: none"> • Trevor Bell (MUN) • Katherine Wilson (MUN/CIS) • Andrew Arreak (SmartICE) • Shelly Elverum (Ikaarvik) 	<ul style="list-style-type: none"> • Sikumiut meeting minutes in English and Inuktitut • Approval of initial research approaches in minutes • Contacts for Inuit youth that may be available in the fall of 2018 to work on the project
7	October 2018	<ul style="list-style-type: none"> • Sikumiut meeting - Selection of most experienced sea-ice users to contribute their IQ (Sikumiut sub-group) - Review of draft Sikumiut–Memorial University research agreement • Sikumiut sub-group terminology workshops (three half-days) • Meetings with Nunavut Arctic College Environmental Technology Program (ETP) 	<ul style="list-style-type: none"> • Trevor Bell (MUN) • Katherine Wilson (MUN/CIS) • Andrew Arreak (SmartICE) • Gita Ljubicic (Carleton) 	<ul style="list-style-type: none"> • Sikumiut meeting minutes in English and Inuktitut • Draft list of Sikumiut sea-ice terms • Approval of draft Sikumiut–Memorial University research agreement
8	November 2018	<ul style="list-style-type: none"> • Sikumiut sub-group seasonal sea-ice IQ mapping workshop • Meetings with Nunavut Arctic College ETP • Update to Hamlet Council 	<ul style="list-style-type: none"> • Katherine Wilson (MUN/CIS) • Lynn Moorman (Mount Royal University (MRU)) • Andrew Arreak (SmartICE) • Jamesie Itulu (SmartICE) • Shelly Elverum (Ikaarvik) 	<ul style="list-style-type: none"> • Paper maps with Sikumiut sea-ice IQ • Training materials for Inuit youth to digitize Sikumiut maps • First drafts of digitized Sikumiut sea-ice maps
9	January 2019	Co-developing methods to create the 20-year history of sea-ice for Mittimatalik	<ul style="list-style-type: none"> • Katherine Wilson (MUN/CIS) • Andrew Arreak (SmartICE) 	<ul style="list-style-type: none"> • Draft methods on what sea-ice IQ to be captured from the satellite imagery
10	February 2019	Sikumiut sub-group <ul style="list-style-type: none"> • First review of draft IQ terminology lists, maps, and graphical illustrations 	<ul style="list-style-type: none"> • Andrew Arreak (SmartICE) • Jamesie Itulu (SmartICE) • Shelly Elverum (Ikaarvik) 	Sikumiut revisions to: <ul style="list-style-type: none"> • Draft digitized Sikumiut maps • List of over 65 sea-ice terms in draft • Draft graphic illustrations of sea-ice IQ to be used
11	March 2019	<ul style="list-style-type: none"> • Sikumiut sub-group - Second review of draft IQ terminology lists, maps, and graphical illustrations • Sikumiut members signatures on Sikumiut–Memorial University research agreement 	<ul style="list-style-type: none"> • Andrew Arreak (SmartICE) • Jamesie Itulu (SmartICE) 	<ul style="list-style-type: none"> • Digitized Sikumiut maps in draft • List of over 65 sea-ice terms in draft organized by season • Draft graphic illustrations of sea-ice IQ in posters • Signed Sikumiut–Memorial University research agreement

Table 1. (concluded).

No.	Date	Purpose/activities	Research team members involved	Outcomes
12	April 2019	Satellite interpretation training for SmartICE Regional Operation Leads	<ul style="list-style-type: none"> • Trevor Bell (MUN) • Katherine Wilson (MUN/CIS) • Andrew Arreak (SmartICE) • Jamesie Itulu (SmartICE) • Shelly Elverum (Ikaarvik) • Lynn Moorman (MRU) • Tom Zagon (CIS) • Jenny Mosesie (SmartICE) • Robert Karetak (SmartICE) 	<ul style="list-style-type: none"> • Training material for Inuit youth to interpret satellite imagery • Evaluations of the training by the trainers and SmartICE Operations Leads
13	June 2019	Sikumiut meeting <ul style="list-style-type: none"> • First review and validation of IQ terminology, maps and illustrations with the larger Sikumiut membership • Discuss the publication of this research article 	<ul style="list-style-type: none"> • Trevor Bell (MUN) • Andrew Arreak (SmartICE) • Jamesie Itulu (SmartICE) 	Sikumiut revisions to: <ul style="list-style-type: none"> • List of sea-ice IQ terminology • Printed Sikumiut sea-ice IQ Travel maps • Printed Sikumiut IQ posters
14	July 2019	<ul style="list-style-type: none"> • Training and co-developing methods to create the 20-year history of sea-ice for Mittimatalik • Review of the Sikumiut model for publication with interested Sikumiut members 	<ul style="list-style-type: none"> • Katherine Wilson (MUN/CIS) • Andrew Arreak (SmartICE) • Jamesie Itulu (SmartICE) 	<ul style="list-style-type: none"> • Training materials to interpret, digitize, and analyze community relevant sea-ice conditions over 20 years • Edits to the Sikumiut model description

Fig. 1. The Sikumiut model. Centre photo used with permission from Lynn Moorman and participants featured.



Canadian Rangers, Government of Nunavut Wildlife, Hunters and Trappers Association, young hunters and outfitters.

Being able to participate in the SmartICE consultation process in Mittimatalik and the establishment of the Sikumiut Management Committee over 2 years and 6 trips (Table 1), allowed me to develop relationships, listen, and learn about the research needs that emerged through these conversations. Although I intentionally did not go to the community with a specific research topic in mind, based on my experience I was interested in understanding more about their sea-ice research needs. What I heard during the early Sikumiut meetings were their concerns about:

- The impacts of climate change making sea-ice travel less predictable and unsafe;
- Challenges of sharing their local sea-ice IQ with the next generation and wanting to improve the safe-sea-ice travel knowledge of youth;
- The desire to repatriate and collate previous sea-ice research data, which includes their sea-ice knowledge, to support their own sea-ice research priorities; and
- The impacts of proposed winter shipping with ice-breaking ships through the sea ice to the nearby Baffinland Mary River mine.

The process so far in co-developing the research is best explained graphically in what is being called *The Sikumiut model* (Fig. 1 and Table 3). The set of nested rings is read from the outside in, reflecting a range of project goals from overarching to specific. The overlapping oval represents the broad influence of the non-Indigenous research partner role. Each of the model parts is explained in detail below.

Inuit self-determination in research

Motivated by ITK's NISR, the outside ring highlights the all-encompassing goal for this project to decolonize the research approach in practice and *Support Inuit Self-Determination in Research* (Fig. 1 and Table 3). Supporting Sikumiut's self-determination in research is addressed through Inuit governance and control of the research, which is focused on community-based research needs.

Embrace Inuit decision-making

The SmartICE Sikumiut management committee in Mittimatalik created a forum from the outset to *Embrace Inuit decision-making* (second ring, [Fig. 1](#) and [Table 3](#)). We met with Sikumiut to discuss a Sikumiut-Memorial University research agreement to formally recognize their role in the governance of the project and as owner of the research data. As discussed later, this formal decision-making role was initially queried by Memorial University, but eventually approved.

In starting to plan our activities Sikumiut directed me to not start with mapping their IQ but to start with documenting their local sea-ice terminology. Their sea-ice terms do more than label different types of sea-ice, they detail the formation, strength, decay, and safety of the sea ice. In an oral culture, having the next generation learn these specialized Inuktitut words is part of Sikumiut's relational accountability to the next generation. Also, helping Inuit youth to be able to communicate with experienced sea-ice users in the community was a necessary first step in improving local sea-ice safety that I hadn't considered.

Starting the workshops with a focus on sea-ice terminology also changed the language of the workshops (October 2018 [Table 1](#)). Normally when western researchers are involved, workshops are run in English with simultaneous translation into Inuktitut. However, our sea-ice terminology workshops were held in Inuktitut. This enabled the discussions and ideas to flow freely without interruption, so their IQ could be properly communicated, captured in their language and not lost in translation. Translators were involved, but used to translate discussions into English concurrently, mostly for the non-Indigenous research partners, but also to support the Inuit youth in expanding their Inuktitut language skills.

Prioritize community-based research needs

The third ring, *Prioritize Community-Based Research Needs*, shows how this research is focused on the research needs of the community ([Fig. 1](#) and [Table 3](#)). Although Sikumiut was pleased with the SmartICE sea-ice monitoring in the community, they also emphasized that to travel safely you need to know so much more than the thickness of the sea ice. Sikumiut voiced the challenges in their ability to share their IQ with young people in their community. Due to the settlement of Inuit, youth are now at school, or work and unable to spend as much time on the sea ice and learning from experienced hunters. Many of the parents of these Inuit youth were also residential school survivors who were denied the experiences of extensive travel and learning sea-ice IQ from their Elders to pass on to their children. Sikumiut was interested in new tools to document (e.g., mapping) and communicate (e.g., Web sites and mobile applications) their IQ to share with the community to improve sea-ice safety ([Wilson 2017](#)). Although other western researchers have recorded and mapped Mittimatalik sea-ice IQ, it was always done for external purposes such as the establishment of Sirmilik National Park ([Manseau 2006](#)), Environmental Assessments for the Mary River Mine ([Knight Piésold Consulting 2015](#)), and consultations for the Canadian Coast Guard's Arctic Shipping Corridors ([Carter et al. 2018](#)). In attempting to reclaim the previous sea-ice IQ that was collected, it was realized that it did not capture the seasonal and regional sea-ice IQ of freeze-up and break-up, and as a result it could not be re-purposed by Sikumiut. Therefore, the research idea that emerged was to have Inuit youth work with Sikumiut to map their IQ of safe and hazardous sea-ice conditions throughout the seasons to share with the community.

I proposed the idea of training Inuit youth in the community to learn how to interpret satellite imagery. Although the CIS maintains the sea ice archive of maps for the main shipping channels in the Canadian Arctic back to 1968 ([Environment and Climate](#)

[Change Canada 2016](#)), no sea-ice archive exists at an Inuit community scale. However the CIS satellite archive extends back to 1997. Training Inuit youth to interpret the archived satellite imagery would mean that this imagery could be used to map the changes in sea-ice around Mittimatalik since 1997 using their IQ. These sea-ice maps would be used by Mittimatalik to: (1) provide evidence of the impacts of climate change on sea-ice around their community; (2) understand when and where the changes in sea-ice are greatest to support their adaptation needs for safe sea-ice travel; and (3) establish a baseline to monitor additional impacts on sea-ice around the community in anticipation of winter shipping (i.e., ice-breaking) being proposed to the Baffinland Mary River Mine ([Bell 2019](#)).

With Sikumiut's support and encouragement, the next step was to seek project funding. Trevor Bell and I wrote the funding proposal that was submitted in November 2017 to Public Safety Canada. The objective of the proposal was to develop Inuit-derived sea-ice hazard maps that were community and culturally relevant to enhance safe sea-ice travel. In April 2018 we were notified that the proposal was successful, and we began moving our discussions into practice.

Develop Inuit-specific values for research

Sikumiut's collective experience and IQ guide how this research has been and will be conducted. In discussing the model with Sikumiut members I originally labelled this goal, *Develop Inuit-Specific Methodologies*. However, the word methodologies didn't translate well or have meaning to the Sikumiut members, and so the label was changed to *Develop Inuit-Specific Values for Research* ([Figs. 1 and 2, Table 3](#)). We discussed early in the co-development of the research what IQ values would guide this research. The initial values that Sikumiut suggested were based on Nunavut's Inuit Societal Values ([Government of Nunavut 1999](#)). The Inuit Qaujimagatuqangit Katimajit (Council), comprising Elders from across Nunavut, collectively agreed upon these values as the IQ foundational principles for the territory of Nunavut ([Table 2](#)).

These values emphasize how Sikumiut wishes to govern the project and themselves and capture the intent of relational accountability in this research. These values also provided a context-specific framework for how I should conduct my research in Mittimatalik and are discussed further in the section, *Changing the non-Indigenous research partner role*.

Strengthening Inuit youth capacity

At the centre of the Sikumiut model is *Strengthening Inuit Youth Capacity* (centre circle in [Fig. 1 and Table 3](#)). Sikumiut wanted youth involved in the ice terminology and mapping workshops so they would be the recipients and beneficiaries of their IQ and to increase Inuit youth research capacity in the community. We discussed how Inuit youth would be trained by Sikumiut and the non-Indigenous research partners to complete the research. Andrew Arreak, the SmartICE Nunavut Operations Lead for Qikiqtaaluk North, now fills part of his time as the Inuit youth researcher for the Sikumiut project outside of the SmartICE monitoring season.

Starting in October 2018 Sikumiut members and partners facilitated a series of workshops to begin documenting the Inuktitut sea-ice terminology that is used in identifying safe and dangerous seasonal ice conditions ([Table 1; Figs. 3 and 4](#)). My co-supervisor, Gita Ljubicic (nee Laidler, then at Carleton University now at McMaster University), provided the training using methods that were co-developed with Inuit in the communities of Igloolik ([Laidler and Ikummaq 2008](#)) Pangnirtung ([Laidler et al. 2008](#)) and Cape Dorset ([Laidler and Pootoogoo 2008](#)). In debriefing after the first workshops, we discussed how not all of the IQ that was shared and discussed could be captured as individual terms and

Fig. 2. Reviewing the Sikumiut model: Brian Koonoo and David Angnatsiak reviewing and editing the English and Inuktitut versions, 25 July 2019. Photo of authors used with permission.



Table 2. Nunavut's Inuit Societal Values (Government of Nunavut 1999).

Inuit Societal Values	Description
Pijitsirniq	Serving and providing for family or community, or both
Piliriqatigiinni or Ikajuqtigiinni	Working together for a common cause
Avatittinnik Kamatsiarniq	Respect and care for the land, animals, and the environment
Qanuqtuurniq	Being innovative and resourceful
Pilimmaksarniq or Pijariuqsarniq	Development of skills through practice, effort, and action
Inuuqatigiitsiarniq	Respecting others, relationships, and caring for people
Tunnganarniq	Fostering good spirit by being open, welcoming, and inclusive
Aajiiqatigiinni	Decision-making through discussion and consensus

definitions, or as discrete map features. Some of this knowledge was about how to prepare before you travel on the ice, what to bring with you, how to test the ice for thickness, where to seek shelter, and warnings about how to travel safely under certain weather and ice conditions. It was then a local Inuit youth artist was proposed to Sikumiut to join the research team to specifically address the IQ that could not be communicated through words or map features. Jamesie Itulu now participates in all the meetings, workshops, and training to develop illustrations as an additional method to communicate Sikumiut's IQ.

In November 2018 the project facilitated another workshop to map Sikumiut's knowledge of seasonal areas of sea-ice hazards and safety (Table 1). The participatory mapping methods used were based on a previous research partnership in the community between Ikaarvik and the University of Ottawa in which Ikaarvik youth received facilitation training (Carter et al. 2018). Following the mapping workshops, Arreak was provided with a laptop and trained by Lynn Moorman (Mount Royal University) and myself on Geographic Information Systems and software (ArcMap 10.5). This meant that Arreak could independently digitize the information captured during the workshop, develop the maps, and make corrections and additions as needed. A total of eight workshops, meetings, and training sessions took place between October 2018 and June 2019 (see Table 1), in which Arreak facilitated all the validation meetings. These workshops have resulted in the documentation of

Table 3. The Sikumiut model summary description.

The Sikumiut Model	Taijaujuq Sikumiut Aturtanga
<p>Support Inuit Self-Determination in Research This model reconceptualizes a new role for non-Indigenous researchers and the approaches needed to truly support Inuit self-determination in research. The model outlines the goals for a community-based project to mobilize Inuit Qaujimagatuqangit (IQ) for sea-ice safety in Mittimatalik (Pond Inlet), Nunavut.</p>	<p>Ikajurturtauningit Inuit Nangminiq Piliriningit Qaujisarnikkut Tanna piliriaksarijaujuq qaujisarutaujuq tukisiumajauunasuk&uni ilauqatauqattarningit Inuit qaujisarinnikkut ammalu qanuq ikajurturtaujunnarmangaata nangminiq piliriaksaqarasuktillugit qaujisarinnirmut. Ukua ataaniittut titirarsimajut saqippallianingani uktuutaujunnartut aaqikpalliajuq nunaliksi pigiartitausimalluni aulajjagartitaujuq Inuit Qaujimagatuqangit sikulirinirmut attarnartailmanirmut Mittimatalingmi, Nunavut.</p>
<p>Embrace Inuit Decision-making The Inuit Management Committee for SmartICE in Mittimatalik, self-titled Sikumiut, governs this research. They decide what Inuit and scientific knowledge is needed and the roles of the partners. They also determine the methods used to communicate their sea-ice IQ to their community.</p>	<p>Atulirtitauninga Inuit Aaqiksiningit Inuit aulattinirmut katimajingit sikulirijikkut mittimatalikmi, nangminiq taijaujumallutik sikumiut, aulajjutaujuq qaujisarinnirmut. Aaqiksiqattartut qanuq Inuit kiklisiniartillu qaujimaningit aturtauniarmangaata qanuiliuqattarniarmangaatalu ilauqataujut. Aaqiksisimakmijut qanuiliurlutik tusaumatittiniarmangata sikulirinirmut Inuit qaujimagatuqangit nunaliksi.</p>
<p>Prioritize Community-based Research Needs Sikumiut identified the need to document and share their IQ of sea-ice to: 1) improve safe sea-ice travel for the next generation; 2) document and understand the impacts of climate change on sea-ice around Mittimatalik; and 3) develop a baseline of Mittimatalik sea-ice conditions in anticipation of increased shipping during the fall and winter seasons to the Mary River mine.</p>	<p>Sivulliujauninga Nunalingni Pigiartitausimajuq Qaujisarinnirmut Sikumiut nalunairsilaurtut titirartauqattariaqarninginnik ammalu uqausiuqattarlutik Inuit qaujimagatuqangit sikulirinirmut ukununga: 1) attarnangittuk ingiraqattaqullugit kinguvaanguniartut; 2) titirartaulutik tukisijaujutiklu ikpiknautisimajut silaut asillirpallianinga sikumut qanigijangani Mittimataliup; ammalu 3) aaqiksilutik pigiarviuqattarunnartumik Mittimatalingmi sikungani qanuilinganinganik pijjutigillugu niriunarninga umiarjuaqarpallianarninganut ukiaksaakkut ukiukkullu nuluujaani ujaraktartunut.</p>
<p>Develop Inuit Specific Values for Research Sikumiut's approach for this project is based on their IQ and the IQ principles outlined in Nunavut's Inuit Societal Values (Government of Nunavut, 1999). Sikumiut will evaluate this project from an Inuit perspective and based on their extensive sea-ice experience</p>	<p>Aaqqisiluti Inuit piqqusingitigut amma qaujisarinnimut Sikumiut qaujisarinnit tungaviqartuq Inuit qaujimagatuqanginnik ammalu iliqusiunginnik Inuit titirarsimajut nunavuumi Inuit iliqusinginnik inusinginni (Gavamakkut Nunavut, 1999). Sikumiut qimiruqattarniartut piliriaksaujunik Inuit qaujimaningit maliklugit ammalu qaujimagajut maliklugit sikulirinirmut.</p>
<p>Strengthen Inuit Youth Capacity Mittimatalik Inuit youth have been hired and trained to do this research. They are facilitating workshops with Sikumiut on sea-ice terminology and mapping locations of safe and hazardous travel. Youth are being trained in computer mapping to interpret, detect and monitor sea-ice trends in 20+ years of satellite imagery and to develop maps of local sea-ice conditions. Inuit youth will also run the process to evaluate the project.</p>	<p>Ajurunniirtitaunirsauqullugit Inuit Makkuktut Pijunnarnirsaulirlutik Mittimatalikmi Inuit makkuktut iqanaijartitaujut pilimmaksartitaullutiklu qaujisarinnikkut. Tukimuaktittiqattartut katimaniujunik sikumiut sikuliritillugit ammalu nunangualiritillugit attarnarningit nangiarnanginningillu titirartaulutik nunanguakkut. Makkuktut pilimmaksartitaujut qarasaujakkut nunangualirinirmik, takunasuqattar&utiklunu asillirpallianiujuq nunanguakkut sikulirijjutinik aragu 20 iluani qangattartitausimajukkullu ajjinguaniq nunangualirpak&utiklu sikulirisimajunik. Inuit makkuktut aulattiniarmijut qimiruvaulirpatat piliriaksarijaujuq.</p>
<p>Changing the Role of Non-Indigenous Research Partners To be accountable and give back to the community, the role of non-Indigenous research partners in this research is to mentor and strengthen Inuit youth capacity in community-based research. This role intersects all aspects of the research to support Inuit decision-making, IQ, Inuit values and ultimately Inuit self-determination in research.</p>	<p>Qallinaat Ikajuqattauninga Pilimmaksainimut Amma Ikajuqattautigaiinummut Nunaliksi pigiaviuluni nunalikuarlunilu, ilaunirijangit qallunaat ikajurtuulutik pijnnarsittivallialutiklu makkuktunik ajunginnirsauliullugit nunaliksi pigiartitaujumik qaujisarinnikkut. Taakkua ilauqatauningit qaujisarinnirmut ikajurtuijut Inuit aaqiktanginnik, Inuit qaujimagatuqanginnik, iliqusiujuniklu ammalu Inuit nangminiq pinasuktanginnik qaujisarinnikkut</p>

Fig. 3. Andrew Arreak and Gita Ljubicic co-facilitating the Sea Ice Terminology Workshops with Sikumiut members Caleb Sangoya, David Angnatsiak and invited community sea-ice expert Bethuel Ootoovak. Mittimatalik, Nunavut, 14–16 October 2018. Photo of participants used with permission.



Fig. 4. Sea-Ice Terminology Workshops, 14–16 October 2018, Andrew Arreak, Katherine Wilson, Gita Ljubicic and Trevor Bell in Mittimatalik, Nunavut. Photo of authors used with permission.



at least 65 sea-ice terms, as well as seasonal maps of sea-ice IQ and illustrations/posters to help communicate Sikumiut's sea-ice IQ further.

The next phase of training for this project was in how to interpret optical and synthetic aperture radar satellite imagery. This training had dual purposes: (i) to enable Arreak to review the archived satellite imagery (20+ years, 1997–present); and (ii) so Nunavut SmartICE Operation Leads, Arreak (Qikiqtaaluk North), Jenny Mosesie (Qikiqtaaluk South), and Robert Karetak (Kivalliq) could learn to interpret the satellite imagery to support local sea-ice monitoring and travel decision-making in their home communities. In early April 2018 a four-day satellite interpretation training session was held in Mittimatalik to train Arreak, Mosesie, and Karetak (Table 1; Fig. 5). The training focused on how to interpret sea-ice in optical imagery, such as MODIS and Sentinel-2 (ESA 2019;

Fig. 5. Experiential satellite interpretation training on the sea ice near Mittimatalik, 11 April 2019. SmartICE Operations Leads Andrew Arreak (Mittimatalik), Jenny Mosesie (Qikiqtarjuaq), and Robert Karetak (Arviat) with Lynn Moorman (Mount Royal University), Trevor Bell (Memorial University). Photo used with permission from SmartICE Inc.



NASA 2019) and in synthetic aperture radar imagery, such as Radarsat and Sentinel-1 (CSA 2019; ESA 2019). Trainers included Lynn Moorman (Mount Royal University), Tom Zagon (CIS), Trevor Bell (Memorial University), and myself. In training non-Indigenous students at universities and staff at the CIS, it would typically take several courses and semesters for students to learn all the basic concepts. However, we did not have to teach the SmartICE Operations Leads about the Arctic, weather, or sea-ice. Our training approach was not theoretical, but applied, experiential, focused only on what they really needed to know and in an Inuit context on the sea ice (Simpson 2014). The capacity of these Inuit youth to learn how to interpret satellite imagery was nothing less than impressive.

Between January and July 2019, Arreak and I worked together to develop the methods to review the satellite data over the past 20 years. Arreak put into practice his previous training on satellite interpretation (April 2019; Table 1) as we learned together what sea-ice IQ could be interpreted and captured in the satellite imagery. Arreak also applied his training on Geographic Information Systems (November 2018; Table 1) as we worked together to determine how to map the sea-ice conditions so we could compare and contrast over the past 20+ years.

In the final funding year of the project (2019–2020) we will continue our work to analyse the satellite imagery and develop the output products from this research. A variety of formats are being considered to share and communicate Sikumiut’s sea-ice IQ such as digital and paper maps, graphic illustrations, posters, and a booklet of Sikumiut’s sea-ice terminology. This will be the first time that sea-ice knowledge in the community of Mittimatalik has been documented and communicated with methods chosen by them, facilitated by Inuit youth from their own community, to meet their own research needs (Wilson 2018b).

Changing the non-Indigenous research partner role

The embedded bottom oval in the Sikumiut model (Fig. 1 and Table 3) represents a re-defined role for non-Indigenous research partners when working with Inuit. The non-

Indigenous role overlaps and intersects with all the goals (rings) of the Sikumiut model to support and help facilitate the research. To ensure that this research was co-produced authentically in this context meant that I also had to follow the Inuit Societal Values (Table 2). I met with Ikaarvik youth early in the co-development process (January 2017, see Table 1), to better understand the eight Inuit Societal Values, their meaning, and how a non-Indigenous person could use these values in their research.

In reflecting on how to practice relational accountability in this context I looked to the Inuit Societal Values of: *Inuuqatigiitsiarniq*, respecting others, relationships, and caring for people; *Piliriqatigiinniq* or *Ikajuqtiigiinniq*, working together for a common cause; *Pijitsirniq*, serving and providing for family or community, or both; and *Avatittinnik Kamatsiarniq*, respect and care for the land, animals, and the environment. In respecting Sikumiut's leadership, the Inuit Societal Values of: *Aajiiqatigiinniq*, decision making through discussion and consensus; and *Tunnganarniq*, fostering good spirit by being open, welcoming, and inclusive were values that I practiced to ensure that all decisions about the project, how it is conducted, by whom, and the resulting output products were made by Sikumiut.

In thinking relationally and being motivated by Sikumiut's desire to increase youth capacity, it became clear that it was no longer about *my* research. It was about practicing relational accountability by using my experience to train local youth to do the research themselves. I take my role to mentor and train Inuit youth to Strengthen Inuit Youth Capacity very seriously. As such, the Inuit Societal Values of: *Pilimmaksarniq* or *Pijariuqsarniq*, development of skills through practice, effort, and action; and *Qanuqtuurniq*, being innovative and resourceful, are values that I adopted and continue to practice.

The combination of reading the literature and enacting relationality according to the community research needs and values allowed me to be open to *hear* their research requests as they emerged, to be *ready* to respond *differently*, and to be able to see my redefined role as a *mentor* in moving from decolonizing guidance to practice. The process of co-developing the Sikumiut model has resulted in a model that respects Inuit decision-making, enhances Inuit self-determination in research, and redefines the role of non-Indigenous researchers. Each Inuit community and research project will have its own context; therefore, the Sikumiut model can only be considered as a potential guide, providing practical approaches and roles as ideas to build on and refine according to other community priorities. However, as Inuit self-determination advances, the ultimate goal would be that the current embedded non-Indigenous research partner role in the Sikumiut model would become obsolete.

Discussion

The Sikumiut model provides examples of how non-Indigenous researchers, in engaging in decolonizing research, can contribute to the greater goal of Inuit self-determination in research. To frame this discussion, I come back to [ITK's 2018b](#)) five NISR priorities to provide examples of some of the ways this research was able to support Inuit self-determination in practice, along with some personal reflections on my decolonizing journey.

Advance Inuit governance in research (NISR Priority #1)

The most important lesson that I have learned from decolonizing research in practice with Sikumiut is that Inuit need to be in decision-making positions to govern, design, and co-produce as much of the research as possible. I now understand why advancing Inuit governance in research is NISR priority #1, because it influences and impacts the entire research process as will be discussed in the following sections.

Enhance the ethical conduct of research (NISR Priority #2)

Prior to starting to work directly with Sikumiut, I am required by the University to receive ethics approval for working with Indigenous peoples. Ethics approvals are based on the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (Tri-Council 2010), known as TCPS2. As part of the university's ethics procedures, participant consent forms are required to gain approval from Sikumiut members for this research. However, as Sikumiut was governing this co-developed research, they were more than participants, they were full-fledged research partners with the university. The Tri-Council Policy that directs the Memorial University ethics process did not include procedures for Inuit governing the research or for maintaining ownership and control over the data. As a result, a Sikumiut-Memorial University research agreement was developed to acknowledge Inuit governance and ownership of their IQ in this project. The University Research Ethics Board (REB) required a subsequent review of the agreement by Memorial University's contracting services as we had moved from requiring consent into a contractual agreement. After a few iterations to revise and reduce the technical language and ensure the ease of translation and accessibility in Inuktitut, the Sikumiut-Memorial University research agreement now states that:

Sikumiut retains the rights and ownership to their knowledge/data collected and documented during this project. Sikumiut will allow Katherine Wilson to have access to this data/knowledge to publish the results, thesis and/or report to fulfill her studies at Memorial University. (Wilson 2018a).

Having Inuit in decision-making positions challenged the TCPS2, the University's REB, and contracting services to reflect on their biases around Inuit capacity and their ability to govern and conduct their own research. It's a small example, but an example, nonetheless, of how an individual researcher can make steps to enhance the ethical conduct of research (NISR Priority #2; Stiegman and Castleden 2015); and ensure Inuit access, ownership, and control over data and information (NISR Priority #4).

Align funding with Inuit Research Priorities (NISR Priority #3)

Inuit communities and organizations like Sikumiut are often ineligible to receive funding without western research accreditation in the form of a college or university degree, and the administrative infrastructure to report and account for funds used. As a result, the current barrier in the Sikumiut model is the power imbalance when non-Indigenous researchers remain in control of the research funding. The funding proposal for this research was written prior to the release of the NISR and was, therefore, unable to benefit from its guidance and reference. However, the proposal was an opportunity to emphasize and communicate the intent to take a bottom-up rather than top-down approach to research, and to develop culturally appropriate emergency prevention information for the community. It also emphasized the value of Sikumiut's IQ in supporting community, territorial, and federal Search and Rescue partners in their recovery efforts for the Mittimatalik region. Although this may not seem significant, our aim was to educate funders about the merits of Sikumiut's sea-ice knowledge and the need to do this research differently.

Ensure Inuit access, ownership, and control over data and information (NISR Priority #4)

Having the research done by Inuit youth in Mittimatalik means that the data in this project never leaves the community. It eliminates the ongoing issue of Inuit communities not having access to their data. Sikumiut maps and sea-ice terminology products were not

digitized and produced by southern graduate students such as myself, but produced and managed by Inuit youth in the community. Arreak and Itulu are able to share their work, get feedback, and make changes as needed, and as directed by Sikumiut. It shows that when Inuit have control and access to their own data, it provides an enormous amount of flexibility, and time and cost savings compared with western researchers needing to return each time to the community to review and validate how they interpreted the research.

Another illustration of how this research supports the NISR Priority #4 is that with Sikumiut governing this research, they are able to control the language and the tools (western, Inuit, and artistic methods) used to best document and communicate their sea-ice IQ. It also avoids the ongoing issue of communities receiving a final report that does not capture their IQ correctly or present it in a way that is unusable for the community. The Sikumiut model eliminates the so-called challenges of how to “incorporate” or “integrate” IQ into western science and provides an example for how to respect Inuit decision-making and IQ for its own scientific merit.

Build capacity in Inuit Nunangat research (NISR Priority #5)

It didn't take long to discover the research capacity and interest in Mittimatalik. Arreak will be completing the equivalent of a Master's research project by the time this work is done, without ever leaving his community. This is an example of how Inuit can do their own research. The training Arreak received from Sikumiut and the non-Indigenous research partners are transferrable skills that can support more research independence in the community: either in the leading their own projects, or in choosing to work with non-Indigenous research partners that suit their priorities and approaches. It is also an example of how non-Indigenous researchers and their institutions can support and build capacity in Inuit Nunangat research. Unfortunately, Arreak's work will not be recognized through any formal qualifications or certification mechanisms. For Inuit to become employed in Arctic research at academic, territorial, or federal institutions, a university degree from a western research institution is typically required. There are currently no formal qualifications earned for the training and research conducted by Inuit in co-produced research. Arctic science institutions need to re-examine their hiring policies and job classifications to build in on-the-job training and equivalent work experience to support capacity building and employment in Inuit Nunangat research.

Reflections from a non-Indigenous researcher

My research relationships so far have developed over 11 community visits (Table 1) along with numerous phone calls, e-mails, texts, and time spent together in the south (i.e., southern Canada) at meetings and conferences. It has also taken time to learn how to be flexible and adaptable with the realities of life in Mittimatalik. The time required to develop relationships and co-develop research that is based on relational accountability means that it will take me six years to complete this research, longer than the typical four-year funded PhD student program.

The institutional barriers of inadequate travel funding and time to develop authentic research relationships in communities have been raised in the literature (Bull 2010; Castleden et al. 2012; Fletcher et al. 2016). Understanding from the outset that I needed to prioritize time and relationships in Mittimatalik helped me and my graduate supervisors plan in advance and manage our expectations. It did require additional proposal writing to seek funding, but this research is an example that travel funding to co-produce research is becoming more available. Based on my experience in Arctic research and funding programs, overall community-based research costs are no more, and often less expensive than the logistical costs required for remote ship and land-based Arctic fieldwork.

However, doing decolonizing research requires the unwavering support from your supervisors to advocate on your behalf about the merits and requirements for this type of research. If researchers and their mentors (Indigenous and non-Indigenous) don't advocate for the time and funding required to do decolonizing research, it will do little to decolonize the university.

Understanding the evolution of western research and how I was trained was a major turning point in my decolonization process. I had never thought about or even questioned western research approaches as a younger graduate student (i.e., when I completed my Master's degree). When Inuit youth and Sikumiut members felt comfortable enough to share with me their negative experiences with western researchers, I was able to understand first-hand the colonial legacy of research. Learning about colonized, decolonizing, and Indigenous research approaches opened a door to a whole new way of thinking and doing research differently. Being a mature student also meant that I brought experience that could be used in mentoring and training Inuit youth; however, the role of the non-Indigenous research partner may not always be as a mentor and trainer. With the proper support from their supervisors and the dedication to take the time to decolonize themselves and develop authentic relationships in the community, non-Indigenous researchers will find their own way to demonstrate relational accountability in their research.

Although I attempt to continuously challenge myself in my role as a mentor and be critically reflexive throughout this process, I know there is always room for improvement. Even as I write this article and re-read the literature I realize that more mentoring and training should be done in an Inuit context, on the sea ice with Sikumiut (Simpson 2014). I cannot say that my motivations were completely without self-interest, or that in seeking funding and in writing this paper I didn't end up speaking for Inuit. Such questions are always on my mind, together with other ones such as:

- What am I suggesting? Is it based on a western or decolonizing research perspective?
- How can we do this research differently?
- How do I tap into and support Inuit youth capacity?
- What skills do I bring that can support community research needs so I can give back?
- How do we make sure this co-developed research is useful for the community?
- Am I prioritizing enough time to develop and maintain my relationships in the community?
- Am I getting caught up in southern timelines and deliverables and forgetting that it's not about the results, it's about the process?

Experiencing the highs and lows of life in Mittimatalik also changed me significantly. It allowed me to see the ongoing impacts of colonialism and understand why the trauma continues. It also allowed me to experience the incredible joy and strength of Inuit and reach a deeper sense of respect for the tenacity and resilience of Inuit in maintaining their culture and demanding their rights for sovereignty and Inuit self-determination in research. I have found that no matter what direction the research takes us, it always works out the way it's meant to. Learning to care for and deeply respect my friends and research partners in Mittimatalik goes beyond the conventional western research community partnership. It ensures my relational accountability to the community of Mittimatalik and gives this work greater meaning for me personally. Practicing relational accountability can transform non-Indigenous researchers from those that *say they do* to those that *do* decolonizing research.

Conclusion

Decolonizing research is a relatively undeveloped research approach in Arctic environmental science in Canada. Although many attempts have been made to increase Indigenous participation, capacity building, and knowledge, these efforts have not significantly advanced because Arctic environmental science has yet to acknowledge how western research continues to perpetuate colonialism (Cameron 2012) or to sincerely practice decolonizing research.

The Sikumiut model demonstrates that Inuit governance over their research was the single most influential NISR priority that contributed towards the overarching goal of Inuit self-determination in research. Greater support for Indigenous and decolonizing Arctic research is needed to demonstrate how universities, funders, and government institutions can change their current approaches to support Inuit self-determination in research. This research also illustrates how non-Indigenous researchers can support Inuit self-determination in research by creating the space and time within their institutions and themselves to educate and decolonize their roles in the research.

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Katimanit/ilinniarniit tusaajiujut atuutiqanlaringmata tamatumunga piliriangujumut ammalu qaujimarminik uqaqattarmata ammalu qujagillariktakka Malachi Arreak, Morgan Arnakallak, ammalu Abraham Kubulu (Mittimatalik). Qujannamiik Mishak Allurut (Ikpiarjuk) inuktituungalirtittiqattarmata titirarsimajunik unurtunik Sikumiut titiraqutinginnik. Ammalu qujannamiik Lynn Moorman tavangat ruiju ilinniarvikjuaq ammalu Tom Zagon kanatami sikulirinirmut pilisirtit aksuruutiqarninginnut ammalu pinasukninginnut ilinniartittillutik makkuktunik inuit. Avatilirinirmut silaullu asillirpal-lianiganut kanatami kanata sikulirinirmut pijisirtit, qujanamiik kajungirsuigassi ammalu ikajurtuigasi qaujisarnirmik, ammalu kanatami uumajulirinirmut pijisirtit, atausiangi-luar&ungalu niuruvigiqattartara nunalingnut ajurnarnirsaugajartillugu tujurmi-viktaqangikkuni ammalu katimaviktaqangikkuni mittimatalikmi qaujisarvikmi. Kingullirpaangani, qujannamiik maruuk qaujimanangittuuk kinauninginnik qimirulaur-matik uqausiksaqarlarumatiklu, isumaksarsiurutiniklu ammalu kajungirsuilaurmatik ikajuutaulaurmata piusivaallirutaullunilu titirarsimajunut.

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