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Listening to Community: Towards Best Research Practices in Pond Inlet, Nunavut

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Listening to Community: Towards Best Research Practices in Pond Inlet, Nunavut

by

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A THESIS

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ABSTRACT

What are the specific conditions and circumstances that can either prevent or facilitate an ethical, meaningful, productive, and respectful collaboration between Settler researchers and Indigenous People engaged in community or regional monitoring programs? How can I bring Settler research and Indigenous knowledge systems together to facilitate more equitable and proactive environmental monitoring programs? My research examines the connections between community-based environmental monitoring, research ethics, and the role of social science in climate change adaptation programs. In this dissertation, I examine the context, community concerns and recommendations for research that emerged during my fieldwork, interviews, and workshops conducted in Pond Inlet and Cambridge Bay, Nunavut, and Calgary, Alberta.

It is widely recognized that over the last few decades, the planet has been undergoing rapid climate change, particularly in the Arctic. Climate change has led to a discussion about the role of Settler research and Indigenous knowledge in understanding and addressing environmental changes and community and regional priorities. In the North of Canada and other Arctic regions, the role of Settler researchers facilitating ecological monitoring, environmental changes, and local and regional policy changes has been largely overlooked. As more Indigenous organizations and communities continue to advocate and demonstrate the validity of their knowledge systems, levels of government and research institutions seek to facilitate and embrace the co-integration Indigenous Knowledge (IK) and Settler research. At an individual level, the co-integration of IK with Settler research will build skills and promote community resilience brought on by climate change. At a societal level, the benefits and potential of integrating IK with Settler research are a resource that needs to be investigated. It can add new and essential

aspects to climate change adaptation strategies. However, it can also be problematic and reproduce already existing colonial dynamics.

In this dissertation, I provide an overview and discussion of the potential role for Settler researchers in climate change research related to adaptation measures for Indigenous communities across the North of Canada and case study results. The outcomes of my research indicate that: 1) there needs to be a significant increase in the number of climate change adaptation projects that incorporate Inuit Knowledge (IK); 2) social science could play a role in the success and sustainability of climate change program development and deployment, and 3) the measurable and tangible ways communities may evaluate the success of adaptation programs. My research also outlines the concerns related to Settler researcher behaviors and practices that a group of Inuit from Pond Inlet and Cambridge Bay, Nunavut, experienced while working on university-based research projects and reports a series of recommendations they provided.

My study also presents the concerns and recommendations of Inuit community members about the need to decolonize university ethics boards and research. The objectives of the workshop were to 1) get a sense of Settler research behavior community members saw as unethical, 2) synthesize the recommendations made by various Indigenous organizations related to ethical engagement and a decolonized research approach, and 3) develop a framework for an ethics workshop aimed at decolonizing university research ethics processes, which Indigenous peoples lead, and research in general.

The findings indicate the great need for: (1) the inclusion of Indigenous epistemologies into university ethics training and certification processes equal to Settler science; 2) improved understandings of how academic disciplines should consult and work with Indigenous communities; 3) protocols and procedures for Settler research to be integrated with Indigenous

Knowledge to be established. Each university, Settler researcher, and Indigenous community has specific circumstances, limitations, obstacles, research priorities, and capacities that need to be understood.

The conclusions of my study are: 1) there is a need for Settler researchers to be aware of and recognize different epistemological orientations; 2) universities and researchers must make a concerted effort to spend more time supporting Indigenous-led research, and co-designing and implementing research projects collegially with Indigenous communities; 3) the relevance of Settler research projects needs to be clearly articulated with community members, and the research results need to be presented to the community in a variety of ways, such as through social media, town halls, plain language reports, etc.; 4) Settler researchers can make efforts to document community-level concerns in order for the community to be able to collaboration with Settler researchers on specific concerns.

"In anthropology, we often think of ourselves as attending to what happens repeatedly. Our version of the empirical thus depends on a conception of the everyday that is stabilized through repetition of what is repeatedly, even ubiquitously, the case. Repetition, for anthropologists, becomes something of a harbinger of ethnographic truth. But I think there are other anthropologies to be done, in this case, an anthropology through the image."

-Lisa Stevenson, *Life Beside Itself*, p.14, 2014.

I include this quote by Lisa Stevenson because it resonated with me. My early training in academia taught me that the action of observing, repeating, and getting the same result is considered scientific truth. I grew skeptical that this was the only method to understand truth, so I approached my dissertation differently by taking direction from community members on the design, execution, and analysis of data. What you are about to read is the result of that approach.

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LIST OF ACRONYMS

Arctic science, like all sciences, employs numerous acronyms, including the following used throughout this dissertation.

AC	Arctic Council
ACUNS	Association of Canadian Universities for Northern Studies
ArcticNet	ArcticNet Network of Centres of Excellence of Canada
ARI	Aurora Research Institute
ASSW	Arctic Science Summit Week
CBM	Community-Based Monitoring
CBPR	Community Based Participatory Research
CER	Citizen Engaged Research
CFREB	The University of Calgary's Conjoint Faculties Research Ethics
CS	Citizen Science
HTO	Hunters and Trappers Organization
ICC	Inuit Circumpolar Council Alaska
ICR	International Centre for Reindeer Herding
IK	Indigenous Knowledge
IPCC	Intergovernmental Panel on Climate Change
IQ	Inuit Qauijimajatuqangit
ITK	Inuit Tapiritt Kanatami

NISR	National Inuit Strategy on Research
NOAA	National Oceanic and Atmospheric Administration
NWT	Northwest Territories
PAR	Participatory Action Research
REB	Research Ethics Board
RCMP	Royal Canadian Mounted Police
TEK	Traditional Ecological Knowledge
TRC	Truth and Reconciliation Commission of Canada

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This dissertation could not be possible without the unwavering support of my husband, Erik Kvernplassen. Erik, thank you for supporting me with this research along with each one of my academic adventures. We have celebrated successes, and you have helped me get through the challenging times. Erik, I love and thank you with all my heart.

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I would also like to thank my **undergraduate mentor,** Dr. Nelta Edwards. Dr. Edwards, thank you for reaching out to me in my early days at the University of Alaska Anchorage,

encouraging me to pursue sociology, igniting the activist in me, being a great mentor, and teaching statistics in a way that did not make me puke. I need to thank Dr. Diane Hirshberg who I first met as an **advisor** for a course I took that examined student success at the University of Alaska Anchorage. From that point on, she has been an incredible supporter of my academic adventures and opened many doors for me. Thank you Dr. Hirshberg!

A huge thank you to the many people from the community of **Pond Inlet and Cambridge Bay Nunavut,** for being incredibly welcoming, supportive, and so much fun. From the moment I first arrived in the community to the last time I was there, I have always enjoyed my visits and look forward to the next time I come back. I would like to sincerely thank Shelly Elverum for appreciating my funky printed socks, your guidance, and the many incredible opportunities I will continue to cherish.

A huge thanks to Shelly, Carey, Zoe, and Naya Elverum. Thank you to Ena Maktar and Michael Milton for being the most fantastic research assistants. Ena, I appreciate how you always kept me on my toes and were never afraid to tell me when I asked stupid questions. Michael, thank you for the ski-doo rides and always brightening the room with your infectious laugh. I also need to thank the Ikaarvik group. Shelly Elverum and Eric Solomen, thanks for including me in many meetings that inspired and motivated me.

I would like to thank several **friends and family** for the incredible amount of love, encouragement, and support throughout the years. Bernard Meltzer's description of friendship perfectly summarizes all: "*A friend is someone who understands your past, believes in your future, and accepts you just the way you are. Truly great friends are hard to find, difficult to*

leave, and impossible to forget. A true friend is someone who thinks that you are a good egg even though he knows that you are slightly cracked".

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"Success is no accident. It is hard work, perseverance, learning, studying, sacrifice and most of all, love of what you are doing or learning to do."

- Pele

DEDICATION

I am dedicating this dissertation to three people. First, my son Oskar Darion Spiers Kvernplassen. Oskar, being your dad is the most incredible title and privilege I will ever have. Watching you grow, learn, and develop are things I look forward to each day, and I love celebrating your achievements and milestones. The second and third are to my parents, Ken Alan Spiers (1957-2016) and Janice Arlene Spiers (1957-2019), for their love, support, and enthusiasm during my academic career. Mom and Dad, I know it was difficult for you to understand why I wanted to pursue my academic interests but thank you for getting there. Even though you are no longer physically here with us, I know you have been by my side each step of the way, especially during the struggles; thank you, I love and miss you terribly.

"In my thirties, I learned that there is a type of pain in life that I want to feel. It is the inevitable, excruciating, necessary pain of losing beautiful things: trust, dreams, health, animals, relationships, people. This kind of pain is the price of love, the cost of living a brave, openhearted life- and I'll pay it."

– Glennon Doyle "Untamed" (9) 2020.

"If you can't love yourself, how the hell are you going to love somebody else?"

-RuPaul Charles.

LAND ACKNOWLEDGEMENT

I would first like to take this opportunity to acknowledge the traditional territories of the people of the Treaty 7 region in southern Alberta, which includes the Blackfoot Confederacy (comprising the Siksika, Piikani, and Kainai First Nations), the Tsuut'ina Nation, and the Stoney Nakoda Nation (including Chiniki, Bearspaw, and Wesley First Nations). I would also like to note that the University of Calgary is situated on land adjacent to where the Bow River meets the Elbow River and that the traditional Blackfoot name of this place is "Moh'kins'tsis" which we now call the City of Calgary. The City of Calgary is also home to Métis Nation of Alberta, Region III. I consider myself blessed to have lived and worked there as an uninvited guest. I, therefore, acknowledge that I have benefited from the dispossession of my Indigenous neighbors, students, and friends. Territorial acknowledgment is not just a formality but a part of my active accountability process and a challenge to colonialism.

Even though land acknowledgments in Inuit Nunangat are not regularly given nor expected, I would like to take the opportunity to do so. I would like to acknowledge the traditional territory of the Inuit people in Inuit Nunangat, specifically the Qikiqtaaluk Region, where Pond Inlet is located. I would like to note the traditional name of Pond Inlet, Mittimatalik, is 'the place where the landing place is.' I have been fortunate to have worked with and been blessed by the generosity and kindness of the people of Pond Inlet; thank you / Quana.

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CHAPTER 1 INTRODUCTION

Introduction

I remember the first day of Environmental Studies 1000 at York University in Toronto, Ontario. It was the first Monday in over seven years when I was not working in a shopping mall, selling clothes. A feeling of liberation and excitement washed over me because I was free from my previous career and starting an academic journey. Several months prior to my first day at York, I was sitting in my apartment reflecting on my career and ambitions. I wanted to do something different, but all the jobs I was interested in required a university degree. Something I was told by a high school teacher that I would never be able to earn a degree due to my low grades. Feeling discouraged and unmotivated, I remembered a friend who recommended watching the film *An Inconvenient Truth* starring Al Gore (Guggenheim, 2006). I was instantly captivated by the film's dire message that we must act quickly to avert catastrophic climate changes. Thinking back, I cannot recall feeling any despair; I felt the desire to seek ways to be involved in finding solutions. Despite my naivete, I decided to throw caution to the wind, quit my job, and see where my ambitions and hard work would take me.

Near the end of my first semester, the professor for Environmental Studies 1000 spent an entire class talking about how climate change is happening faster in the Arctic than in other regions. My first thoughts about the Arctic were images of beautiful snow-covered landscaped untouched for many years. During the summer break, I decided to travel to Alaska to experience the outdoors and set eyes on the scenery that would likely change over the next few decades. I was awestruck by the enormity of the mountains, glaciers, wildlife, and open space. The sun

never really set, and I found myself fighting fatigue, but I could not get enough of what I saw; it was the most beautiful place I had seen. I did not want to return to Toronto. I then took another bold step and applied for admission to the University of Alaska, Anchorage. I traveled back to Toronto, sold all my possessions, withdrew from York, and moved to Anchorage, Alaska, to start the next semester.

This dissertation is the culmination of my experiences, knowledge, and passion for working in the Arctic. I have always enjoyed working with people and feel a personal alignment with the theory of symbolic interactionism. The idea behind symbolic interactionism is that, as social actors, we create meaning of objects and each other through our repeated interactions with one another (Huber, 1973). That is, symbolic interactionism prioritizes relationships. As social actors, our interactions can differ based on our environment, our exchange or emotional state, and our values (Huber, 1973). For example, the way I speak and act with an extended family member versus a colleague is very different based on the meaning I give to each relationship. I am particularly interested in how others engage in symbolic interactionism and what elements shape their interactions. Social sciences offer a way not only to understand the complexities of the human condition, but they can help bring different perspectives together to find creative solutions to social issues. After I graduated from the University of Alaska, Anchorage, I was admitted to a master's program at Lakehead University, where I wrote a thesis that compared models of measuring community well-being in Alaska and Yukon. The thesis included interviews with key informants. During my master's research, I heard from Indigenous leaders who pointed out how these various models of well-being were created. They noted that the information included in the models negatively portrayed their people and communities by,

"using an indicator to measure the proximality for residents to access community services such as healthcare providers there is drastic difference between urban and rural communities" (Spiers, 2015). What this indicates is that models that measure proximity to healthcare providers as a good thing will paint a negative picture of rural communities who typically must travel great distances to access quality healthcare. It was brought to my attention that Indigenous people were excluded from the design, data collection, or dissemination of these models. Indigenous anthropologist Zoe Todd, in her article "An Indigenous Feminist's Take On The Ontological Turn: 'Ontology' Is Just Another Word For Colonialism," states: "Rather than bequeathing climate activism to the Al Gores of the world, when will Euro-American scholarship take the intellectual labour and activist work of Inuit women like Rosemarie Kuptana and Sheila Watt-Cloutier seriously?" (Todd, p.7, 2016). Todd raises an important question about giving voice to Inuit women who have been engaged in climate activism for just as long or even longer than white men like Al Gore. As a Settler researcher, I learned from my master's thesis that we all should make a much more deliberate effort to engage with Indigenous communities and scholars much earlier in our research processes because we do not have a strong record of doing so.

The findings from my MA thesis helped focus my attention on issues within the North of Canada, which influenced the development of my dissertation topic and approach. I have always been interested in Arctic Indigenous ways of knowing because I am aware that it not only has been largely excluded from Settler research but denigrated as unscientific and unobjective (Agrawal, 2002). Indigenous Knowledge systems have successfully kept Indigenous people alive in some of the harshest conditions on the planet. In reflecting on Zoe Todd's work however, I must also acknowledge that I have work to do as a Settler researcher. I need to

prioritize the engagement of Indigenous scholars, research, and methodologies because there is an incredible contribution by these individuals and knowledge systems that has been largely neglected by Settler researchers. This is no small task as it requires the acknowledgement that my Settler academic training perpetuated colonialism by continuing to steal Indigenous ideas and knowledge or simply ignoring them as not credible (Battiste, 2014). While there has been a great deal of effort by many Settler researchers, it is important to recognize that this work is not complete and perhaps never will be. I can play an important role in fostering fully collaborative collegial relationships and spaces with Indigenous communities and scholars if I first acknowledge our colonial history and that colonialism is still present.

Above, I discussed why I chose to begin this academic journey, my interest in working with people, and the current problems with Settler research. In the next section of the introduction, I will discuss the interrelationship of climate change in the North of Canada, and colonialism, as well as the limitations of Settler science when understanding climate change. This is critical to the last section of this introduction, where I will discuss the arguments of this dissertation. Before I proceed however, I want to discuss some important terminology. The terminology is about various types of researchers such as, western, Settler, southern, and come-from-away.

According to the Cambridge Dictionary, a researcher is "someone who studies a subject, especially to discover new information or reach a new understanding" (2023). This approximates a broad definition that the public in Canada might have of the term “researcher.” However, that definition is very limited, and does not represent the plethora of researchers or the diversity of their approaches, understandings, and knowledge. In my dissertation, choice of language is

important - and I want to explain to you how I chose to use specific labels, especially as they relate to describing research. This is important to me because I believe that nuance and specificity is important when establishing how I see myself and others within this scholarship. I will first review several specific terms used to describe non-Indigenous researchers I used in my dissertation that I both encountered during my literature review of Indigenous and non-Indigenous scholars as well as experienced while working in Yukon and Nunavut. Indigenous and non-Indigenous scholars have used a variety of terms for researchers that may reflect a researcher's knowledge systems, privilege, or behaviours. I see here that labels can refer to things other than the epistemological paradigms in which people work. When discussing non-Indigenous researchers, I use the terms: western, Settler, outsider, dominant, southern, and come-from-away Settler. You will notice I almost exclusively use Settler as that is how I identify. Next, I cover how residents of Pond Inlet and other Inuit communities use the term “southern researchers.” They often use this term when referring to researchers who travel to their community from institutions across the Canadian provinces. I then discuss the standard practices of homogenizing northern and southern Canada into two regions, which is problematic and colonial and should change. Finally, I conclude by explaining the term I have chosen to describe non-Indigenous researchers.

Non-Indigenous researchers and research can be defined as practitioners who utilize specific methods to "explain, predict, and control the natural environment through the invention of technology to deal with human problems through Judeo-Christian secularism" (Liboiron, p.52, 2021). Max Liboiron discusses in detail the past and ongoing colonial issues with research, which they call “western research” in their book *Pollution is Colonialism*. They identify as a

person of Michif-Settler descent. They further point out that western research has been based on the domination, appropriation, and theft of Indigenous land and knowledge and often treats many other forms of knowledge as tangential and invalid (2021). Many terms describe non-Indigenous researchers based on encounters, ideologies, and traditions. For example, Max Liboiron uses the term “Settler scientists” and “come-from-away Settler” as they argue that Settler scholars are trained in and may continue to practice science in a way that continues to perpetuate colonialism for the Settler state (2021). "Come-from-away" is a term often used in the province of Newfoundland to describe someone who is not from the province and has travelled to the island with the intention of not staying for long. Liboiron describes colonialism as “controlling, acquiring, and polluting land” (pg.10, 2021). They argue that one can understand Settler science by understanding it as "dominant science" (2021). Dominant science can be understood as a product of colonialism that is ever evolving within the western discourse of science and technology; it employs the only valid methods to uncover truths and facts (Liborion, p. 54, 2021). Taking an anticolonial stance, which Liborion does themselves, facilitates "acknowledging the shortcomings of western science and learning to maneuver, work around and through the contractions, injustices and violent structures that exist" (pg. 22, 2021).

Indigenous scholar Margaret Kovach uses the terms western research. In her book *Indigenous Methodologies*, she talks about the troubling history of western research and its methods used to exploit, steal, and misrepresent Indigenous people and cultures (Kovach, 2021) She draws attention to qualitative research and ethnography as its historical practice and methods have been exploitative, narrow in scope, and often at the expense of Indigenous people and their communities. In advocating for the decolonization of methodologies, she encourages the use of

Indigenous methodologies by both Indigenous and non-Indigenous researchers. She says that the most critical elements of research are relationships and responsibilities, no matter who the researcher is (Kovach, pg.36 & 39, 2021). Kathy Absolon, another Indigenous scholar, talks about her struggles with the term research and how she defines Indigenous research in her book *Kaandossiwin*. She avoids the term "research" because of its ongoing and historical colonial domination and practices (Absolon, 2011). Instead, she uses "re-search" to signify her belief that for Indigenous people, the act of re-search is “to search again from our location and to search again using our ways as Anishinaabek is Indigenous re-search” (Absolon, p. 21, 2011). She uses the term re-search to acknowledge the Indigenous process of “knowledge seeking and production” (Absolon, pg. 21, 2011). This process can also be understood as a revitalization of or re-claiming knowledge, history and understandings that reject the colonial practices of the Settler society (Absolon, 2021).

Linda Tuhiwai Smith, in *Decolonizing Methodologies*, acknowledges the destructive colonial past of non-Indigenous research and states that she is concerned with “policies that intruded into every aspect of our (Indigenous) lives, legitimated by research, informed more often by ideology” (Smith, pg.3, 2021). She identifies as a Ngāti Awa and Ngāti Porou, Māori scholar. The colonial Settler state has passed laws, acts, and implemented policies that have and continue to colonize Indigenous people and their communities. For example, western research and its methods are still used mainly in changing policies, increasing, or decreasing funding, and illustrating the lives of Indigenous people (Smith, 2021). Arguably, the policies, political and social conditions she describes are framed by colonial institutions that have, in many ways, continued to leave out and wrongfully use Indigenous people. Her critiques align with American

Indian scholar Vine Deloria, Jr. in many ways, such as the preconceived "truths" that researchers often create to describe Indigenous people through racist practices and exploitative means and to legitimate policies that are detrimental to Indigenous people (Smith, pg.8 & 10, 2021). While she does not critique a specific western discipline like Deloria does anthropology, she looks at how European Settler interests fueled by imperialism have led to the colonial academic disciplines that marginalize, ignore, and generalize the social world and human nature (Smith, pg.54 2021).

American Indian scholar Vine Deloria, Jr. takes a much more direct critique of western researchers in his chapter "Anthropologists and other friends" in *Custer Died for Your Sins* (1969). He starts this satirical chapter by saying, "But Indians have been cursed above all other people in history. Indians have anthropologists" (Deloria, pg.78, 1969). Throughout the chapter, he mocks anthropologists' colonial practices and behaviours by pointing out things such as the typical short summer field seasons where anthropologists will go into a community to make observations (which often seem to be preconceived) and turn those into "facts" or "truths." He argues that young Indians cannot stand up against the opposing colonial forces of mainstream white culture, unlike black youth who created Black Power due to the acceptance of "Indians-are-a-folk-people" developed by anthropologists (Deloria, pg. 83, 1969). Despite the well-deserved critique of anthropology and western research, he does advocate for the knowledge, skills, and funding to help tribes and move beyond studies that are not chosen, directed, or involving Indigenous people (Deloria, pg. 100, 1969). Deloria wants Indigenous people to conduct research that uses Indigenous epistemologies and direction. He does not outright reject western researchers from continuing their work but advocates for a change in which funds be given to tribes to give back to the community and for their research and its outcomes to be

owned by the tribe (Deloria, 1969). In this way, Deloria foreshadowed many of the principles advanced by the First Nations Information Governance Centre (FNIGC) through their Ownership, Control, Access, Possession (OCAP) approach (FNIGC, 2007)

Shawn Wilson, author of *Research is Ceremony*, uses the term dominant scholars and the dominant system of research throughout his book to discuss non-Indigenous research and scholars. Wilson identifies as a Opaskwayak Cree scholar. His book focuses on Indigenous research methods, methodologies, critical elements, and more. One of the primary tenets of his text is the relational context of an object or phenomenon and that the closer we look and examine such things we go further away from context (Wilson, 2008). He also encourages a break from the dominant western research tradition and encourages non-Indigenous and Indigenous scholars to engage with Indigenous research. He argues that Indigenous research is done to make a difference in people's lives and that this outcome is established before the start of a project and reinforced during the research process (Wilson, 2008).

Emilie Cameron, author of *Far Off Metal River*, and Lisa Stevenson, author of *Life Beside Itself*, use similar terms when discussing non-Indigenous researchers. They are both non-Indigenous scholars. For example, when Stevenson talks about Inuit describing RCMP or healthcare providers, she uses the word Qallunaat, an Inuit word typically used when referring to white people. Furthermore, the term Qallunaaq refers to non-Inuit regardless of racial or ethnic origin (Stevenson, 2014). Cameron uses Qablunaaq, which goes into further detail to describe non-Inuit, including non-Indigenous researchers, government officials, healthcare workers, and fly-in-fly-out workers (Cameron, 2015). For Cameron, Qablunaaq's have been the actors involved in expanding colonial relations with the Inuit (Cameron, pg. 13, 2015). However, the

term Qablunaaq goes beyond racial and ethnic labels; it represents colonial relations through Inuit encounters with whalers, traders, missionaries, academics, and government agents and the ongoing Settler colonial state that see the territory of Nunavut as a resource to be used for the benefit of southern Canada (Cameron, pg. 15, 2015). Both authors recognize that most research in the North of Canada is conducted within the dominant system of western research and that I need to recognize that as outsiders and non-Inuit, I represent an intersectional identity that is complex and formed by historical and contemporary colonial relations but that I have an opportunity to change those relations for the positive.

While attending meetings in Yukon, conducting my interviews in Pond Inlet, and attending the ScIQ summit in Cambridge Bay which I describe in chapter 2, I noted that the Inuit I spoke and interacted with referred to non-Indigenous Canadian researchers as southern researchers. Interestingly, non-Indigenous researcher from outside of Canada were referred specifically to their country of origin: researchers from the United States were American, from the United Kingdom were British etc. Through this practice, Inuit pointed to the problem of homogenizing northern and southern Canada. The problem with homogenizing both regions is that they span thousands of kilometres and represent diverse peoples, geographies, and communities that are very different. This is true when looking at communities from the West and East, North and South and so forth. As Settler researchers who work in the various territories in Canada, I tend to use the term "Canadian North" or simply say the "North." Southern Canada has historically and continues to treat the northern territories as a land where resources are extracted and shipped south, waste accumulates and pollutes the land, and most high paying jobs go to southern Canadians that fly-in-fly-out (Southcott, 2012; Hird, Predko, and Renders, 2022). The

term “North” is used in the national anthem of Canada, and there is an idealized notion that one needs to “go north” from southern Canada to discover themselves and that it is “...conventional to refer to the North as a particularly storied place...” (Cameron, p.21, 2015). Northern Canada has been subjected to colonial cultural domination by the Settler state from the south, and Indigenous people and communities were and are treated as wards of the state. This domination was demonstrated by Northern administrators (civil servants who hailed from southern Canada) who would provide to aid Indigenous people across the northern territories in the form of healthcare, money, and other colonial services (Stevenson, 2014). The idea of labelling someone as “southern” therefore is a common practice to reveal the historical and contemporary colonial relations between northern and southern Canada.

In this dissertation, the term for a non-Indigenous scholar I have adopted is Settler researcher. Settler researchers like me must acknowledge that we are uninvited Settlers on Turtle Island (Canada) conducting research for the Settler state. I did not choose the term dominant scholar because I believe that by applying that label, we would then further support the idea of colonial domination of research as Settlers. Similarly, I do not use the term southern scholar, even thought, my informants in Pond Inlet and Cambridge Bay, Nunavut apply that label to researchers from across Canada, I believe where we reside does not define our position or approach. Furthermore, I believe that our society is gaining greater awareness about the validity and breadth of Indigenous research, which is helping break down the silo of Settler research. We may actively work towards decolonizing our methods, methodologies, and understanding; however, we have been trained and often use Settler methods and view our research through Settler ideology. I encourage Settler researchers to ‘retrain’ ourselves and to lean into Indigenous

methods and methodologies, and actively work towards breaking down the dominant Settler approaches to invite and encourage Indigenous scholars and their epistemologies to break down the Settler state.

Climate Change in the North of Canada

The North of Canada is undergoing rapid and complex ecosystem changes due to increasing global temperatures (climate change), such as unpredictable and fast melting sea ice, changing migration patterns of wildlife, and the thawing of permafrost (Huntington et al., 2007; Morris et al., 2013; Johnson et al., 2015; NOAA, 2021). These changes affect the region's ecosystems, communities, and inhabitants (Larsen & Fondahl, 2014). According to Indigenous Services Canada, across the Canadian territories, there are over 59,000 Indigenous people living in the three territories of Yukon (8,195), Northwest Territories (20,860), and Nunavut (30,555) (2020). In Yukon, Indigenous people represent 23% of the population; Northwest Territories, 51%, and 86% in Nunavut, respectively (ibid). The use of the terms Indigenous people or Indigenous communities is problematic as it arranges certain Indigenous people into a single group while leaving others out (Smith, 2021). In Canada, the term Indigenous people are still widely used, particularly by various levels of government, including First Nations, Inuit, and Métis peoples. However, there is a move to address Indigenous people by their specific community or region and move away from a pan-Indigenous approach (Smith, 2021). Indigenous scholar Margaret Kovach supports the move because "it is about identity and respect" (Kovach, p. 38, 2021).

In addition to migration and resource development pressures across the Canadian territories, the issues of ongoing Settler colonialism is very present: sociocultural dislocations (as reflected in challenges to Indigenous knowledge systems, higher-than-average suicide rates, substance abuse, and domestic violence rates). Amidst these changes and pressures, the North of Canada is gaining global attention due to climate change (Lovecraft & Eicken, 2011; Grémillet et al., 2015; Cochran et al., 2013; Walsh, 2013; Larsen & Fondahl, 2014).

There is little doubt in the Arctic that, as the summer sea ice continues to diminish, new problems and issues, such as increased marine shipping, resource extraction, and security, will arise (Dodds & Nuttall, 2019). Indigenous scholar Zoe Todd writes,

> "We may go the way of the dinosaurs, and it will be because the dominant human ideological paradigm of our day forgot to tend with care to the oil, the gas, and all of the beings of this place. Forgot to tend to relationships, to the ceremony (in all plurality of ways this may be enacted), to the continuous co-constitution of life-world between humans and others" (Todd, 2017, p.105).

What Todd is pointing out here is that our dominant political structures, economies, and capitalist system are focused on production and consumption of more precious natural (non-renewable) resources. It appears that we will not change this relationship until there is no more oil or gas left and all that we will have is the damaging effects of that consumption.

One of the starkest changes in the North of Canada is the severity and extent of sea ice loss, which has been dramatically declining since 2007 (Serreze & Stroeve, 2015). Sea ice loss poses a risk to food security (Strawa AW et al., 2020) and threatens aspects of Indigenous knowledge systems, cultural traditions, values, and land-based knowledge. One aspect of these knowledge systems is that they have successfully determined the best times of year to engage in

various cultural activities (Larsen & Fondahl, 2014). However, these knowledge systems are now stressed and frequently no longer provide reliable information due to rapid ecological changes, further compounded by past and ongoing colonialism. (Vlasova & Volkov, 2016) Colonialism in the North of Canada has taken many forms, such as forced relocation, residential schools, the killing of sled dogs, and the removal of people to southern sanatoriums for the treatment of tuberculosis (Kulchyski & Tester, 2007; Stevenson, 2009). All these activities by the colonial state were attempts to "improve" the well-being of the Inuit by forcing them to participate in Settler forms of governance and lifestyle (Cameron, 2015). While there is a tendency to talk about colonialism in the past tense in the North of Canada, it is still ever-present, and "the effects of colonialism run deep" (Cameron, p.109, 2015). Many social issues emerged and are still prevalent due to these colonial acts. For example, physical and mental health problems, drug and alcohol abuse, suicide, poverty, and language and cultural practices loss, alongside continual land dispossession (Hicks, 2007; Cameron, 2015; Coulthard 2014). These colonial impacts are further exacerbated by climate change. For instance, species and ecosystem loss is occurring rapidly in the North of Canada, and it is likely to continue because of climate change (Tremblay et al., 2020). Climate change can have profound implications for Inuit traditional and cultural practices, which have historical and contemporary relationships with species and the land (Reibold, 2022). Furthermore, with increased pressure and opportunity to participate in the wage economy, heightened by the rising costs of necessities such as food and fuel, there might be less time spent on the land this disrupts the passing on of knowledge on to youth (Cameron, 2020).

Settler research has a considerable focus on the predicted impacts of climate change on the Inuit way of life in the Arctic, its species, and the ecosystems (Wrona et al., 2016; Rosol et al., 2016; Cameron, 2020). A primary challenge in using Settler research and its associated epistemological orientations is that it can often continue to perpetuate colonialism and "risks delimiting the way in which northern Indigenous perspectives, concerns, and critiques can be heard and be effective" (Cameron, p.104, 2012). Settler science often states a problem that will utilize numerous methods to study, understand and potentially offer solutions. In the case of the North of Canada, the problem is the potential adverse effects of climate change on human and animal life. Settler science often picks a geographically bounded area determined by ownership or utility for the benefit of humans (Reibold, p. 2, 2022). This Settler perspective goes counter to the relational understanding that Inuit often hold about land: that it is not a resource but a space that extends beyond human use (Reibold, 2022). Therefore, the limitations of Settler research may bring forward different challenges when trying to understand the breadth of obstacles brought on by climate change, especially if the focus is narrow and does not incorporate Indigenous Knowledge and perspectives (Zehr et al., 2016; Fidel et al., 2014). There has been an exponential trend upwards in studying the effects of climate change in the North of Canada (Zentner, 2019). Many of these studies are led by physical scientists interested in understanding physical changes over time (Ford & Pearce, 2010). While more Settler social science studies are being developed as well, physical science dominates the research field, and the quantitative findings from physical science limit how we understand the effects of climate change in the region (Finnis, Sarkar & Stoddart, 2015). It is vitally important that there is a close examination of environmental monitoring, the methods used to generate this knowledge, and the subsequent findings so that the most holistic understanding is obtained. That there is no reliance on a limited

number of approaches. In the next section, I discuss the overall Settler research context of where my dissertation is situated.

Problem Context

My dissertation focuses on the experiences of some Pond Inlet and Cambridge Bay, Nunavut, residents who have worked with Settler researchers on projects in or around their communities. I began working within these two communities due to a relationship I formed with the Inuit youth group, "Ikaarvik." Ikaarvik is a not-for-profit organization that has supported Inuit, First Nations, and Métis youth. The word Ikaarvik means “bridge” in Inuktitut. The goal of this organization is to bridge Settler science methodologies with Inuit Qauijimajatuqangit (IQ) so that youth can take a more active role in understanding and advocating for relevant Settler research in their communities (Oceanwise, 2020). I attended the Arctic Observing Summit in Fairbanks, Alaska, in 2016, where I met members of Ikaarvik. We had several conversations about how Settler researchers should approach a community to determine if there is a mutual interest in working together. As a result, I not only formed connections in Pond Inlet but also with Ikaarvik. I was invited by Ikaarvik to co-facilitate a workshop on the development of guidelines and protocols for Settler researchers in Cambridge Bay at the ScIQ summit. The various projects that the residents I spoke to range from wildlife monitoring, sound pollution, homelessness, and food security. In 2018, as I was conducting research, the Inuit Tapiriit Kanatami (ITK) produced the "National Inuit Strategy on Research” (NISR) (Inuit Tapiriit Kanatami, 2018). The strategy recognizes that research can play a positive role in communities.

However, it points to the central issue that frequently, research is for the researcher's benefit and perpetuates an exploitative relationship that needs to end. NICR calls for approaches that create meaningful connections with residents and communities, which are outlined in five priorities:

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" (ITK, p.6, 2018).

I go into further detail about NICR in chapter four, to illustrate how the document calls for changes to the current federal funding structures, university ethical guidelines, and supporting capacity building. My dissertation attempts to investigate all the priorities of NICR by asking residents in Pond Inlet and Cambridge Bay how they believe Settler researchers can act to promote these priorities. I use this document because it is one of the first position statements from a national Inuit organization about how they want the relationship with research to change. As a Settler researcher working in an Inuit community and with Inuit, it is essential to respect this document and act in good faith with it. Documents such as these are vital because it is from an Inuit organization that set clear guidelines of how they want their relationship with research to change. It can create new opportunities for working together and generate new forms of knowledge. Below, I summarize my ethnographic research and dissertation outcomes that includes my research questions that guided my project.

The research questions that drove my research therefore were: What conditions and circumstances can prevent or facilitate an ethical, meaningful, productive, and respectful collaboration between Settler researchers and Indigenous people engaged in community or environmental monitoring programs? What approaches can Settler researchers employ to help solve this complex question while simultaneously decolonizing the research process and equitably collaborating with Indigenous people and their communities? (Bull, 2010; Wong et al., 2020; Eitzel et al., 2017; Smith et al, 2020). Reibold discusses decolonization as “efforts that seek to rectify colonial injustices and revive Indigenous self-governance" (Reibold, p.2, 2022). It "is not just about restoring property rights or the value of the land lost; it is also about enabling Indigenous people to rebuild relations with species and ecosystems” (Wong, et al., p. 5, 2020). My research questions, which have been asked before by Settler and Indigenous scholars, although in different ways, are increasingly relevant and vital in this era of reconciliation. The importance of these questions in moving forward with reconciliation is that they have the potential to align with Indigenous calls to decolonize the research process and empower Indigenous people to take the lead with research. Across the Arctic, the effects of the rapidly changing climate are putting additional stress on ecosystems, local and regional resources, food security, housing, and knowledge systems (Ford et al., 2012). Equitable collaboration between Settler and Indigenous researchers could lead to innovative and creative ways to adapt to these changes. For example, adaptation research to climate change in the Arctic is "a response to community demands for the localized study of climatic change” (Cameron, p.112, 2012). This collaboration could also lead to a greater understanding and application of various knowledge systems, epistemologies, and pathways to decolonize Settler research (Nicolaidis et al., 2011; Pearce et al., 2012). Decolonization is a complex process, that perhaps might not have an end

point but both Indigenous and non-Indigenous scholars agree that working towards introducing different ways of doing research that Settler research has been mostly resistant to.

My dissertation aims to be community-based in that I only proceeded with this project with the explicit permission from community members in Pond Inlet and Cambridge Bay, Nunavut, and that all the steps I took were approved by community members to respect and honor Inuit epistemology. My primary message in this dissertation is the importance of Settler research to do research in different ways that include Indigenous worldviews. I argue that it is important to avoid a pan-Indigenous approach when thinking about working with Indigenous Peoples. Using a pan-Indigenous approach internationalizes and regionalizes the issues and struggles of some colonized peoples while neglecting others (Smith, 2021). A pan-Indigenous approach is problematic for many reasons. For example, Indigenous peoples have specific cultural, linguistic, and knowledge systems, and while there are strong linkages between people in and amongst communities, they are not homogenous. There is a common thread across Indigenous cultures in that they have emerged from their ancestral interrelationships to place (Kovach, p. 38, 2021). As a result, some Indigenous scholars and organizations believe that Indigenous peoples share a similar worldview and, to some degree knowledge system, with other Indigenous peoples. However, they are contextualized by acknowledging individual communities and places (Kovach, 2021). It is necessary for Settler research to bring awareness to and correct the legacies of its colonial practices and Settler dominance over Indigenous people and their knowledge systems in Canada and other countries. Indigenous scholars Shawn Wilson and Kathleen Absalon point out that Settler research has labeled itself as “true” knowledge and structured a hierarchical order, which is the dominance of all aspects of life and society (Wilson,

2008; Absalon, 2011). These legacies and continued perpetuation can create challenges for collaboration with Indigenous organizations and communities; rapid societal and environmental changes further compound these challenges. Various Indigenous organizations, government mandates, and community policies have aimed to promote the equal treatment of Indigenous methodologies, research, knowledge, and epistemologies with Settler approaches, and yet, there appears to be little progress (Armitage et al., 2011; Keenan, 2015; Tedford, 2016; Dale et al., 2011).

Why Community Participatory Research is Necessary

Settler research has been increasingly employing community participatory research approaches across the Arctic. The approach is often to develop adaptive measures while engaging communities as equal partners in setting the research agenda, collecting data, and analyzing results (Smith, 2021). If done collaboratively and collegially, these approaches may promote decolonial and innovative approaches that promote Indigenous Knowledge, methods, and research as equal to or leading above Settler methods (Doering et al., 2022). Building from Reibold's definition of decolonization of land, "…the Indigenous view is premised on being able to resituate their ethnogeography, that is, to materialize their land ontology in the way they live on, with, and off the land" (Reinbold, p.5, 2022). Efforts to decolonize research could be made by restoring Indigenous ways of knowing and leading the research process. However, colonial bureaucratic structures can be problematic in facilitating decolonial pathways. For example, the way research is funded is prescriptive and does not support funds being given directly to

Indigenous communities (Doering et al., 2022). As a result, while Indigenous ways of knowing are being utilized increasingly in Settler research, they appear to be overwhelmingly used as an afterthought or tangential (Dei & Simmons, 2011; Brayboy & Castagno, 2008). Despite increased Indigenous participation in Settler research that aims to empower communities and increase individual and local capacity, this approach has been critiqued as control over marginalized groups by the colonial state (Bowman, 2018; Lam et al., 2019).

There are two primary reasons why it is necessary to examine the role of Settler research in ethically developing adaptation programs to climate change in Nunavut. First, the North of Canada is experiencing the effects of climate change much faster than many other regions in the world. The lack of infrastructure and limited economic resources makes ecosystems, people, and their communities increasingly vulnerable due to a lack of local capacity and increasing reliance on transported supplies. Second, in this era of reconciliation and with the Truth and Reconciliation Commission's (TRC) calls to action, it can be argued that now is the time for Settler research to engage in ethical and collegial efforts to meet these calls and work collaboratively with Indigenous people. In chapter three, I discuss the TRC and calls to action in more depth.

According to Ngāti Awa and Ngāti Porou Māori scholar Linda Tuhiwai Smith colonization cannot be understood without acknowledging its connection to imperialism (2021). Imperialism can be understood through four different forms and functions. "(1) imperialism as economic expansion and (2) imperialism as the subjugation of 'others'; (3) imperialism as an idea or spirit with many forms of realization; and (4) imperialism as a discursive form of knowledge" (Smith, p. 24, 2021). Where colonialism is "in part, an image of imperialism, a

particular realization of the imperial imagination" (Smith, p.26, 2021). Colonialism, in large part, is still around today; it is pervasive and is an ever-ongoing process (Liboiron, 2021). According to Indigenous scholar Max Liboiron, colonization takes many forms, such as Settler colonialism, extractive colonialism, and internal and external colonialism (2021). Liboiron writes:

"Colonialism is a way to describe relationships characterized by conquest and genocide that grant colonialist and Settlers ongoing state access to land and resource that contradictorily provide the material and spiritual sustenance of Indigenous societies on the one hand, and the foundation of colonial state-formation, settlement, and capitalist development on the other" (Liboiron, p.9, 2021)

While I speak in detail about colonialism, I have not addressed nor elaborated on the differences between it and Settler colonialism. There are important distinctions that I elaborate on below. First, colonialism can be understood as the domination and acquisition of resources to feed the larger colonial empire (Glenn, 2015). The notion of Settler colonialism can also be associated with the expansion of capitalism and the acquisition of wealth in the form of land, politics, and violence (Coulthard, p.7, 2014). This acquisition of wealth has been and continues to be fueled by the marginalization and domination over Indigenous peoples, their lands, and rights (Coulthard, p. 151, 2014). According to Indigenous scholar Glenn Coulthard, Settler colonialism "is not race (or religion, ethnicity, grade of civilization, etc.) but access to territory. Territoriality is Settler colonialism's specific, irreducible element" (Coulthard, p.7, 2014). This is echoed by another Indigenous scholar Audra Simpson who states "Settler colonialism, as a process inherent to the making of states, wedding as it is to capital accumulation and as such, a story that it likes to tell itself (and others) as a story of liberalism (Simpson, p. 440, 2016). The

Settler state has not demonstrated a desire for Settler colonialism to ever stop or slow down. In fact, the Settler state is always looking at ways to reinvent and create new Settler relationships (Lorenzo Veracini, 2010 & Glenn, 2015). According to Coulthard "… in the Canadian context, colonial domination continues to be structurally committed to maintain-through force, fraud, and more recently, so called "negotiations" … (Coulthard, p.7, 2014). The rudimentary idea of Settler colonialism is that it is an ever-evolving relationship, one that is not satisfied by the procurement of land, it will continue to permeate all aspects of society and continue to evolve in complexity and form (Glenn, 2015). Simpsons summarizes this well by stating "Settler colonialism is predicated on a territorial possession by some and, thus, a dispossession of others" (Simpson, pg. 205, 2011).

Margaret Kovach, Indigenous scholar, believes that colonization can take the form of genocide and access to land, resources, and knowledge (2021). Settler research has a history of racist practices and attitudes that stem from colonial ethnocentric assumptions that exploit, not include, Indigenous people, and that continues today (Smith, 2021; Liboiron, 2021). There is growing pressure from these Indigenous scholars and others to decolonize Settler research, practices, and training and debunk its long-held tradition as "the" truth-telling science (Liboiron, 2021). Settler research has been and continues to be viewed as a colonial practice because in simple terms it attempts to quantify, re-organize, categorize knowledge. Furthermore, the methods used within Settler research aim to test and predict how specific phenomena will respond to various examinations. Settler research appears to be inflexible and unwilling to accept new forms of knowledge or worldviews in meaningful ways but there has been attempts and

some progress has been made. However, it is necessary to ask if it is possible to decolonize Settler research.

Scholars do not agree on one definition of decolonization or a single pathway toward it. Held argues that decolonizing using Eurocentric frameworks is likely impossible (2019). Decolonization can be understood from multiple perspectives and broken down further into its respective parts. On the one hand, it has been argued that it can be done through large-scale institutional or societal changes, while the other is small-scale through groups or individuals (Asadullah, 2021). In *Wretched of the Earth* (1963), author Frantz Fanon outlines decolonization as a process that would be violent and cause complete social disorder. Scholars such as Linda Tuhiwai Smith state that the decolonization process means that Settler theory, knowledge, or research should not be abandoned or ignored. Indigenous people must put their knowledge, epistemology, and worldviews first (Smith, 2021). Decolonizing research will require reclaiming history and epistemological, ontological, and pedagogical standpoints before being colonized (Grande, 2015; Smith, 2021). Cram (2018) argues that decolonization is necessary to preserve Indigenous languages and cultures.

It is also necessary to acknowledge the discourse of anticolonialism, which is understood by how it does not reproduce Settler and colonial entitlement to land, Indigenous cultures, concepts, knowledge, and life (Liboiron, p. 132, 2021). Leanne Simpson calls for a critical analysis of colonialism and dismantling the colonial power structures to protect, recover, and maintain Indigenous Knowledge systems (2004). Max Liboiron provides an example of anticolonial science, "I am proposing anticolonial science as knowledge systems, sometimes

arrayed with, sometimes adjacent to, and sometimes explicitly against the knowledge systems of dominant science (Liboiron, p.133, 2021).

Positionality Statement

As an anthropologist that comes to this region as an outsider, I found it necessary to follow the tradition of engaging in reflexivity. Reflexivity is an active process that carefully considers bias, beliefs, and forms of knowledge that guide a researcher to an authentic centre of evidence and rationality (Ben-Ari & Enosh, 2010). Reflexivity acknowledges that the politics of representation is a critical step to share because it supports transparency and trustworthiness. (Kovach, 2021). According to Creswell, trustworthiness can be evaluated by a researcher's reflexive engagement as it clarifies and makes bias transparent (2003). Reflexivity is essential as it provides insight into theoretical perspectives such as feminism, poststructuralism, and queer theory that I applied to my research (Kovach, 2021).

Third-wave feminism and poststructuralism have challenged academic disciplines historically dominated by white, Settler, middle-class, and heterosexual men (Garrison, 2000). Third-wave feminism and poststructuralism promote contextual experience as a legitimate form of knowledge and challenge the positivist academic training that is often impersonal, neutral, and resistant to new training and knowledge creation (Kovach, 2021; Haraway, 2020). It is important to acknowledge that feminism has been challenged for its attitudes resembling Settler worldviews, neglect of Indigenous and women of colour beliefs and opinions, and attitudes toward them as the Other (Smith, 2021). However, challenging the colonial state and the

evolution of feminism allows for a better understanding of who the victims of globalization, climate change, and the growing income disparities are and how they are being affected (Benería, L., Berik, G., & Floro, M., 2015). Feminism impacted my approach to research by reinforcing the importance (for me) of challenging Settler worldviews. It also helped me to be inclusive and understand the interconnectedness of disparities and inequality with the impacts of climate change. Colonial institutions such as all levels of government and most universities and colleges have historically excluded Indigenous scholars' contributions, knowledge systems, and epistemologies. For example, Zoe Todd describes a time when attending a lecture by Bruno Latour about climate change, he discussed the mythological figure, Gaia, from the ancient Greek tradition. Gaia is understood as the personification of Earth. Todd believed Latour would then discuss Sila from Inuit mythology, which is believed to be the breath or soul of the Earth. This was not the case as he did not mention Sila (Todd, 2016). What this illustrates is an example of how Settler scholars oftentimes continue to ignore Indigenous epistemologies and that the values and ideas of Indigenous people can often be ignore in Settler scientific discourse.

Further understanding how individuals have been and continue to be the victim of the colonial state invites us to understand queer theory. Queer theory questions the social construction by the colonial state of gender, sexuality, and race and the relationship between them (Tilsen, 2021). The colonial state, particularly natural science, is structured on binary assumptions suggesting only two opposing options exist. For example, truth/untruth, male/female, colonizer/colonized, and objective/subjective, which silos the natural sciences away from the humanities; Queer and Indigenous theory challenges this structure and welcomes a propagation of identities (Tilsen, 2021; Tallbear, 2019 and Smith, 2021). Queer theory tells us to

think of binaries as false universalization; we should pursue a more intersectional approach that acknowledges our positionality (Weiss, 2016). Conducting research from feminist, post-structural, and queer theoretical perspectives can facilitate a unique challenge to the colonial scientific method (Liboiron, 2021). These understandings impacted my dissertation by reinforcing the importance of positionality and to be open to a broader understanding of worldviews by rejecting binaries and challenging me to do research in a different way than the dominant Settler approaches.

As an outsider, I cannot relate to the experiences that my participants described in this dissertation. In my worldview, I see things through the lens of my own experiences, and I act in the ways that I consider appropriate according to those experiences. Although I do not identify as Indigenous, I am drawn to many Indigenous peoples' struggles and issues. My interests are complicated and multilayered. First, I deeply respect Indigenous ways of knowing that promote respect for all living things and challenge the Settler hierarchy that places humans above all. When thinking about the many broken promises, theft of land, racism, cultural genocide, treaties that have not been ratified, and the numerous encroachments on Indigenous lands, I am struck by many Indigenous leaders' resolve and continued determination to make the colonial state accountable for its actions (Deloria, 1988; Joseph, 2018). As a Settler, I understand that I have responsibilities to disrupt colonial knowledge reproduction/and the reproduction of colonial practices.

I am a white queer Settler researcher who is an uninvited guest in Treaty 7 and 8 in Alberta. My family has strong roots in Canada, spanning the Maritimes, Prairies, West Coast, and Yukon; my ancestors immigrated from England, Russia, Norway, and the United States. I

hope to continue conducting research collaboratively in communities in Nunavut. I recognize that my privilege as a white, educated male reflects that of many other Settler researchers and that there is a long tragic history of inappropriate Settler actions across Nunavut and other parts of the North of Canada (Cameron, 2015; Stevenson, 2014; Noble, 2015).

As a Settler researcher, whom the colonial state has permitted to conduct Settler research for the colonial state, I too, represent the crux of the problems I have outlined in my research question. I try to position my privilege and positionality as an ally that brings together queer and decolonial approaches (Tetreault, 2018). Being an ally, to me, means that I take the position to not only advocate for better representation and respect for Indigenous communities' concerns, knowledge systems, and worldviews, but that I hope my work and future career brings more Settler scholars together as allies. I believe we are seeing progress as a nation moving through reconciliation with the Indigenous people of Canada. For example, the papal visit and apology in the summer of 2022 was part of the Truth and Reconciliation Commission's Calls to Action (White & Reguly, 2021). However, I do not feel that the work is done and may never be complete. In the article "The Incommensurability of Decolonizing Critical Posthumanism" by Hird et al., the authors state "It is to leave awkwardly open the real possibility of the irreconcilability of knowledge and thus the impossibility of a decolonized post humanism within structures, systems, and processes of on-going (Settler) colonialism" (Hird, et al., p 16, 2022). A recent study conducted by Focus Canada, found that, among the general population, in Canada there has been an increased understanding and acknowledgement of the mistreatment and tragic abuses brought by the Settler state atop Indigenous people (Focus, 2021). I am aware that some of the complex and systemic issues that are still ongoing are linked to colonization, residential

schools, the forced relocation of Inuit to the High Arctic, and non-informed consent experiments (Hansen & Dim, 2019; Wotherspoon & Hansen, 2013). I am also aware that these issues are highly personal and that I will never fully comprehend their gravity and severity. Like many other Settler researchers, I actively participate in community engagement and local understanding of histories by listening to local priorities and spending a great deal of time fostering and nurturing respectful relationships; research is about relationships. However, it is also clear to me that there are researchers who do not take an active role in those areas.

Research carries significant historical trauma and abuse for many Indigenous people. Linda Tuhiwai Smith writes:

> "From the vantage point of the colonized, a position I write and choose to privilege, the term 'research' is inextricably linked to European imperialism and colonialism. The word itself, 'research,' is probably one of the dirtiest words in the Indigenous world's vocabulary. When mentioned in many indigenous contexts, it stirs up the silence; it conjures up bad memories; it raises a smile that is knowing and distrustful" (Smith, p.1, 2012).

This passage from Smith made me question my motivations and intentions regarding my research in Nunavut, working with Inuit because I did not want to make common errors that Inuit have spoken out about regarding Settler researchers. It was also important for me that it was clear the community wanted to develop this research project together that addressed issues of common concern. Research fatigue is common in Indigenous communities because Indigenous people, particularly Inuit, are among Earth's most researched groups (ITK, 2018).

However, I am acutely aware of the horrible mistreatments and neglect by the colonial state and some of the horrible experiments done in the name of research. Knowing the range of

feelings that the word research can conjure up for Inuit, I made sure that the research I did came directly from a community desire by regularly reviewing the project, its design, and its goals with community members. I also employed local people to assist with the research project, help with interviews, and discuss the findings. I made a point when speaking with potential participants about where the project came from and who was involved. I stated that the goal was to provide their voices and concerns so that perhaps Settler researchers would know how to change their approaches when working with them in the future.

In summary, I hope this dissertation explains what is precisely wrong with colonial research, that it suggests alternatives to the colonial research process, stresses the importance of building trusting and authentic relationships, provides alternatives to outdated processes and does so from a community-based and community-driven way. Indigenous and non-Indigenous northerners were the most influential contributors to my research and gracious enough not to be silent and to trust me with their stories. Throughout my fieldwork, concerned community members, administrators, youth and elders, and Settler researchers shared their concerns and positive experiences with the research. I have done my best to ensure that their voices and contributions are acknowledged by recapping each interview individually with the participants, working through the analysis and findings with my community-hired research assistants, and working with community members on publications from this research.

Progression of the Research

Figure 1 provides a broad overview of many of the steps taken during my dissertation, showing the evolution of the research and how various community visits and workshops influenced the research question and outcomes. When I started my Ph.D. in 2015, I traveled to Pond Inlet Nunavut. I met with community members, government officials, and directors of organizations, which ranged from fishing cooperatives, international Indigenous organizations, and community youth groups. After conducting my field research in the spring and summer of 2018, I undertook a thematic analysis to determine the various themes that emerged from the field notes and interviews. Through discussions with the two research assistants I hired, we mutually agreed upon the final set of themes employed in this dissertation. In addition, because of my field research, I co-developed and held a research ethics workshop at the University of Calgary to help several community members from Pond Inlet understand the university ethics process. The workshop brought together members of the Conjoint Faculties Research Ethics Board (CFREB), University of Calgary graduate students from archeology, geography, and sociology, and the Pond Inlet representatives, to allow them to discuss their frustrations with the general university research ethics process and Settler researchers. Another outcome of my field research was that I was invited to co-facilitate a workshop with the Ikaarvik group in Cambridge Bay to discuss Settler researchers' obstacles and barriers. The group brainstormed potential solutions to these barriers and offered detailed steps that Settler researchers should take before, during, and after a community visit.

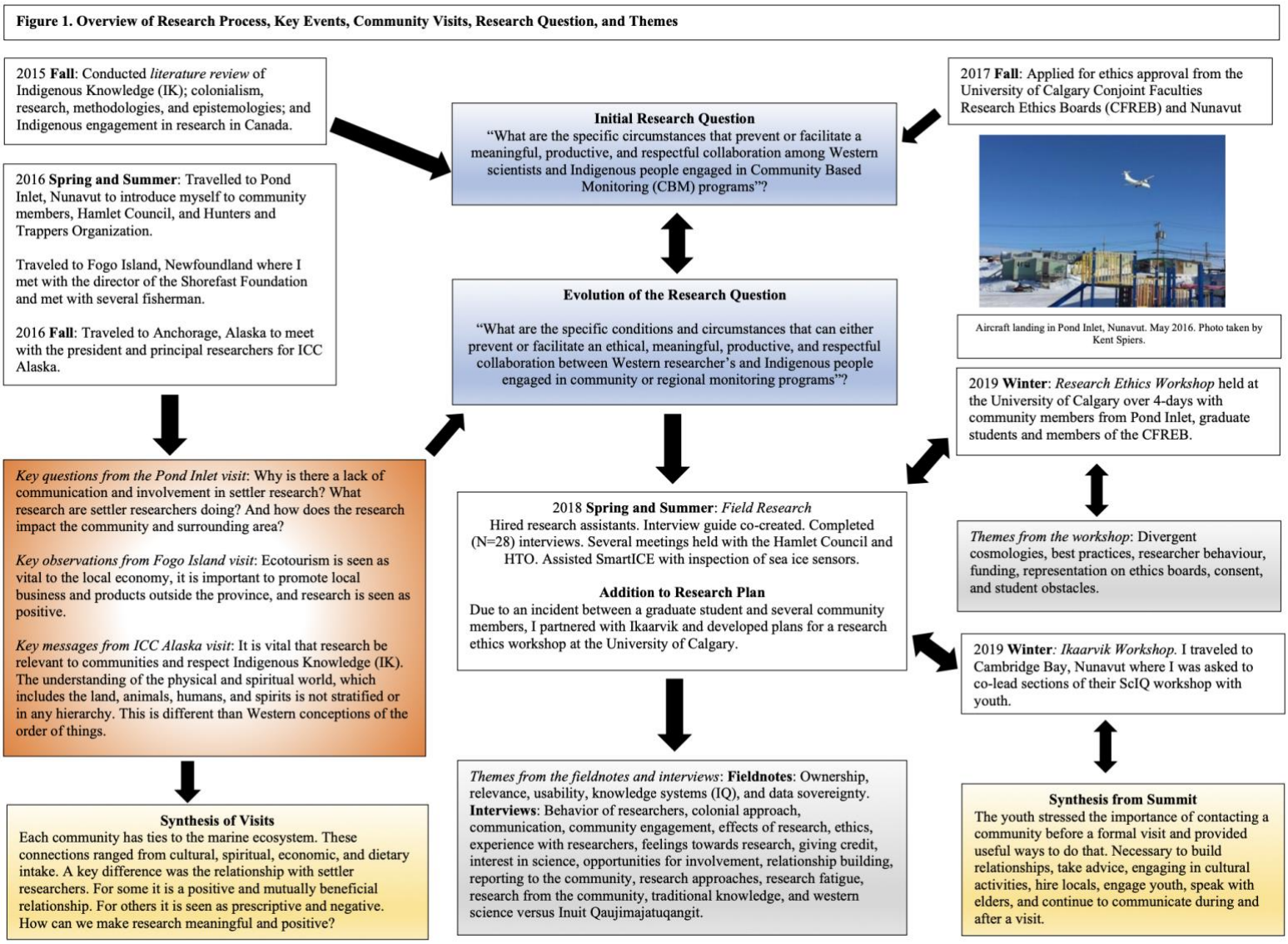

Figure 1. Overview of Research Process. Key Events, Community Visits, Research Questions and Themes

Dissertation Outcomes

I describe my dissertation as anticolonial while acknowledging that Settler research can have a place in fostering community and regional climate change adaption programs in Nunavut. Settler researchers can contribute to anticolonial science by fully engaging in Indigenous research, acknowledging the colonial nature of Settler research, and taking an active role in rejecting its often-narrow viewpoint and limited nature. Despite there being initiatives to incorporate Indigenous methodologies and knowledge there are still questions around the hierarchical nature of these research designs which often use Settler science to guide a project. To embrace anticolonial science and research design there needs to be a greater effort to move away from designing research with Settler methodologies and frameworks. My dissertation aims to provide some insight on how Settler researchers can operate in the space of anticolonial science while also acknowledging that it will require further investigation and engagement. I believe that by documenting the accounts of Pond Inlet and Cambridge Bay residents that worked on Settler research project provides us with important information about how best to facilitate a co-operative and collaborative relationship between Inuit and Settler researchers.

There are a few outcomes from the shared experiences of these residents. First, all residents I spoke to had experiences working with Settler researchers. They provided specific behaviors and actions that they would like to see Settler researchers adopt in their approach to working in, around, and with Inuit communities that respect Inuit Qauijimajatuqangit (Inuit Traditional Knowledge). Second, not all Settler research was viewed as inappropriate, but there was a strong judgment that most research is cyclic and, therefore, unnecessary. However, when

these residents expressed concerns about the effects of climate change, food security, health, and the overall adaptive capacity of their communities, they shared specific research projects they would like to see in their communities. What is clear is that strategies such as NICR validate the need for concrete, measurable and precise plans that better suit the region. IQ must be preserved, and Settler research empowers and equips Inuit and their communities to be resilient and adapt to the effects of climate change. My dissertation provides ways for physical and social scientists trained in Settler approaches to acknowledge their colonial approaches to community engagement and research and welcome a move toward an anticolonial framework.

Overview of my Dissertation

The following section provides a brief overview of the chapters in this dissertation.

Chapter 2, What makes a successful climate change adaptation research program in Nunavut? In this chapter, I argue that as climate change effects continue to increase, there may be an opportunity for various knowledge systems such as, Indigenous and Settler to be co-designed or co-developed to create adaptation programs for vulnerable communities that meet current and future needs. I also support the movement for Indigenous research and methodologies to take the lead in developing such adaptation programs. I further elaborate on the important elements necessary to develop a community climate change adaptation program that is developed from an interdisciplinary framework. I also present the potential impacts of climate change in the North of Canada by reviewing some of the current climate change science and literature. I then describe into current climate change adaptation programs that have been operate

in circumpolar environments with the objects to identify best practices for existing and future projects. I present discussions I had with some residents in Pond Inlet, Nunavut about the types of climate change adaptation programs they would like to see in their community and then conclude with some potential best practices for developing such projects.

Chapter 3, Community-Based Participatory Research: A Means to Decolonize research, provides an overview of several community-based research approaches, their advantages, and their disadvantages. One of the challenges with the many variations of community-based research is the need for a coherent or consistent definition. These concerns and others can create challenges when trying to understand what research approach may be proposed and what methods might be used during the research process. In this chapter, I discuss which approaches might be the most appropriate for Settler researchers that support collaboration with Inuit communities.

Chapter 4, Decolonizing Research in The Era of Reconciliation: A Collaborative Approach with Inuit from Pond Inlet, Nunavut, and the University of Calgary, assesses the university ethics training and certification process and how it can be problematic for various Indigenous communities. I intended to write about something other than university research ethics training and approval. However, when conducting my fieldwork, I witnessed tensions between some community members and a Settler researcher that led me to discuss how university graduate students are trained and cleared to do research. I believe in carefully reviewing any research proposed in any community. However, there is a tremendous opportunity to change and improve the process for graduate students. This manuscript details an ethics workshop I co-developed and held at the University of Calgary to help several community

members from Pond Inlet understand the university ethics process. During the workshop, I brought together members of the Conjoint Faculties Research Ethics Board (CFREB), several University of Calgary graduate students, and the Pond Inlet representatives. The workshop allowed the Pond Inlet representative to discuss their frustrations with the general university research ethics process and Settler researchers. I chose to do this project because it is the responsibility of researchers to attempt to tackle such challenges, and while this project is not perfect, this was an essential first step.

CHAPTER 2: WHAT MAKES A SUCCESSFUL CLIMATE CHANGE ADAPTATION RESEARCH PROGRAM IN NUNAVUT?

In this chapter, I argue that the most important characteristics of a community climate change adaptation program are multiple knowledges at the program's centre, interdisciplinarity, and collaboration. Without these characteristics (at a minimum) a community climate change adaptation program will not succeed. During my dissertation research, I concluded that, Settler research, Indigenous Knowledge (IK), and Indigenous research, can come together in an interdisciplinary approach. This coming together can include various methods and multiple stakeholders, such as researchers, community members, politicians, educators, Elders, and youth. I have organized this chapter as follows: first, I present an overview and discussion of the potential impacts of climate change in the North of Canada by citing various climate change reports and scientists and sharing accounts from Indigenous scholars. This overview is necessary to understand why climate change adaptation programs are essential to Arctic and circumpolar research agendas. Second, I will discuss how some current adaptation programs have successfully collaborated across multiple knowledge systems, institutions, and various levels of expertise. My ethnographic research that I discuss in this chapter includes an analysis of a climate change adaptation program called SmartICE in Pond Inlet, Nunavut. SmartICE provides a critical case study on developing and implementing a successful environmental monitoring adaptation program. Third, I examine some examples of current and ongoing adaptation programs in various Arctic countries by reviewing peer-reviewed articles and online content from these various programs. Fourth, I present the voices of several Inuit residents' responses to climate change and the research they would like to see that may help their community adapt to

climate change. Last, I detail some examples of the best approaches to working collaboratively with Inuit communities, as observed through an Inuit youth summit as well as my observations and experiences. I conclude this chapter by emphasizing that the typical approach of Settler researchers coming into Inuit communities to conduct research needs to change. With that being said, I provide some specific approaches and insights from my research and the growing body of knowledge around this topic that Settler and Indigenous scholars' support. Finally, I emphasize that the community needs to be the decision-maker when developing a local climate change adaptation program.

Climate change is one of the greatest existential threats that humankind is facing. Its effects are unfolding rapidly across low-lying island nations, mid-latitudes, and the Arctic and Subarctic regions, seriously impacting Indigenous communities (Crate, 2011; Taconet, Méjean, & Guivarch, 2020; Vitousek et al., 2017). Climate change is a process that has measurable and ever more visible changes in weather conditions. Most of the scientific community agrees that since the onset of the Industrial Era, human actions have contributed to an increase in the global average temperature of 0.85°C (Hamilton, 2016; IPCC, 2014; Zhang et al., 2019). The Arctic and Subarctic regions are warming at more than twice the global average rate, affecting the region's inhabitants with greater food insecurity and biodiversity loss (Ford et al., 2012; Lam et al., 2019). The Intergovernmental Panel on Climate Change (IPCC) provides regular assessments of various earth systems to report on the state of climate change. The IPCC is a body of the United Nations created in 1988 to provide scientifically supported assessments, reports, and adaptation options to policymakers in the face of the changing climate. The IPCC assessments and reports demonstrate consensus and confidence in climate change projections (IPCC, 2020).

The IPCC documents project that over the 21st century, surface temperatures will continue to rise, even if all emissions were to stop today. Some of the likely outcomes due to the planets average temperature continuing to rise, are more intense and prolonged heat waves and more intense and frequent extreme precipitation events (IPCC, 2014). According to the National Oceanic and Atmospheric Administration (NOAA), nine of the ten warmest years have occurred between 2010 and 2020, with the warmest being 2016. Strong evidence is that this trend will continue into the next decade (NOAA, 2020).

Impact of climate change on Arctic regions

The Arctic is undergoing rapid physical and ecological changes due to the increase in global temperatures, including loss of multi-year sea ice, early melt and later freeze-up of the sea, lake, and river ice, glacial melting, changes in precipitation patterns, amplified severe flooding, and increased coastal erosion in some regions (Watt-Cloutier, 2015; Descamps et al., 2017; Dudley, Hoberg, Jenkins, & Parkinson, 2015; Zentner, Kecinski, Letourneau, & Davidson, 2019). These physical changes impact life at all levels, from microbial to human, and impact Indigenous people disproportionally (Huntington et al., 2007; IPCC, 2019; Morris et al., 2013; S Nickels et al., 2002; Pour, Wahab, Shahid, Asaduzzaman, & Dewan, 2020; AMAP 2021). These changes are not insulated; they can have a domino effect and impact many ecosystem segments. For example, some physical changes in the Arctic and subarctic are impacting the breeding activities of various species: polar bear pregnancies have declined, which is attributed to the lack of sea ice due to warming water around denning areas (Deschamps et al., 2017). Moreover, there has been a decline in the population growth rate of reindeer, ascribed in part to increased rain and

snow events that encase the normally accessible vegetation and habitats in their traditional calving grounds (Descamps et al., 2017). The many physical changes greatly impact wildlife, vegetation, and human socio-cultural activities and health. While the traditional activities of Indigenous peoples and the harvesting of country food (seal, caribou, and walrus) have experienced and adapted to changes over time, the rapidity of change has never been as intense as in the last few decades (Watt-Cloutier, 2015; Ayanlade et al., 2020; Bell, Briggs, Bachmayer, & Li, 2015). The consequences of these changes go beyond access and availability of country food for Indigenous peoples. Several Indigenous communities have shared experiences where the reliability of their knowledge system has been stressed, strained or even unable to provide the necessary health and safety insight to engage in socio-cultural traditional practices (Watt-Cloutier, 2015; Cochran et al., 2013; Lam et al., 2019; Silvertown et al., 2013). These traditional activities, knowledge systems, epistemologies, and belief systems have built up multigenerational interactions with the ecosystem (Cochran et al. 2013, Larsen and Fondahl 2014, ICC 2015, Loring and Gerlach 2015, Clark et al. 2016, Greaves 2016, Chatwood et al. 2017, Grat et al. 2018, Dankel et al. 2020, Griffen 2020, AMAP 2021). The effects of climate change in the Arctic have consequences for the rest of the planet, and as Indigenous leader Sheila Watt-Cloutier states, “the Arctic is the health barometer for the planet (Watt-Cloutier, p.205, 2015).

Indigenous people who live in the Arctic are particularly vulnerable to climate change due to the rapid changes affecting the land, water, sea, and animals they depend on for subsistence and cultural practices (Schmidt et al., 2021). The Arctic region spans northern Canada, Greenland (Denmark), Finland, Iceland, Norway, Russia, Sweden, and Alaska (Arctic Council, 2017) and is home to over 4 million people, 10% of whom identify as Indigenous.

Indigenous people across the Arctic have lived successfully and sustainably with the natural environment for thousands of years and have built strong and robust IK systems (e.g., Inuit Qauijimajatuqangit or IQ) built on their interactions with the natural and spiritual environment (Inglis, 1993; Zehr et al., 2016).

Approximately 40% of Canada's landmass is within the Arctic and Subarctic regions, representing 25% of the global Arctic (The Arctic Institute, 2021). According to Environment and Climate Change Canada, since 1948, the national overland temperature has increased by 1.7°C (Zhang et al., 2019). In contrast, in northern Canada, which refers to the region above 60° latitude, the temperature has increased by 2.3°C (Zhang et al., 2019). There has been an overall increase in precipitation in northern Canada and a decrease in the southern part of the country. Climate extremes across Canada have increased, such as more frequent heatwaves, prolonged droughts, and longer, more intense wildfires (Zhang, et al., 2019) Also, there has been a decrease in freezing temperature events, particularly in northern Canada (Zhang et al., 2019). There is an increased risk to the freshwater supply caused by the decrease in snowpacks, loss of glacier ice, and warm summers leading to increased evaporation (Zhang et al., 2019). The oceans surrounding Canada are acidifying, although there is regional variation in the extent and degree of acidification (Zhang et al., 2019). Both marine and fresh waters are generally warmer and have become less oxygenated over the past century (Zhang et al., 2019). These trends, if they continue, will have severe consequences for marine ecosystems and the communities that rely on them. There has also been a marked increase in sea level rise projected to continue and cause further stress on coastal communities in the Atlantic and Pacific and some communities in the Arctic (Zhang et al., 2019). For example, as sea levels rise, islands in the territory of Nunavut might not be livable. There will likely continue to be less historically important structures, such

as Fort Conger, which played an important role in early Arctic explorations (Dawson et al., 2013; Lazrus, 2012). Ice-free sea conditions across the North of Canada have continued to grow, with the latest projections indicating that the summer months will be ice-free as early as 2050 (Zhang et al., 2019). The rapid changes due to climate change are profoundly affecting the environment, ecosystems, and ways of life for animal species and humans and putting safety and survival at risk. The North of Canada is home to approximately 114,000 people spanning the three territories (Yukon, Northwest Territories, and Nunavut) and two provinces (Quebec and Newfoundland and Labrador), with approximately 53% identifying as Indigenous and 47% as non-indigenous (Statistics Canada, 2017). Statistics Canada defines Indigenous people as individuals identifying as 'First Nations people, Métis or Inuit' (Statistics Canada, 2017). People who identify as Inuit live in 51 communities across this region (Figure #2, Canadian territories), which to many is known as Inuit Nunangat (homeland). Inuit Nunangat represents 50% of Canada's coastline, stretching from the Inuvialuit Settlement Region (NWT) in the west, through Nunavut, Nunavik (Northern Quebec), and Nunatsiavut (Northern Labrador) in the east (Inuit Tapiriit Kanatami, 2021).

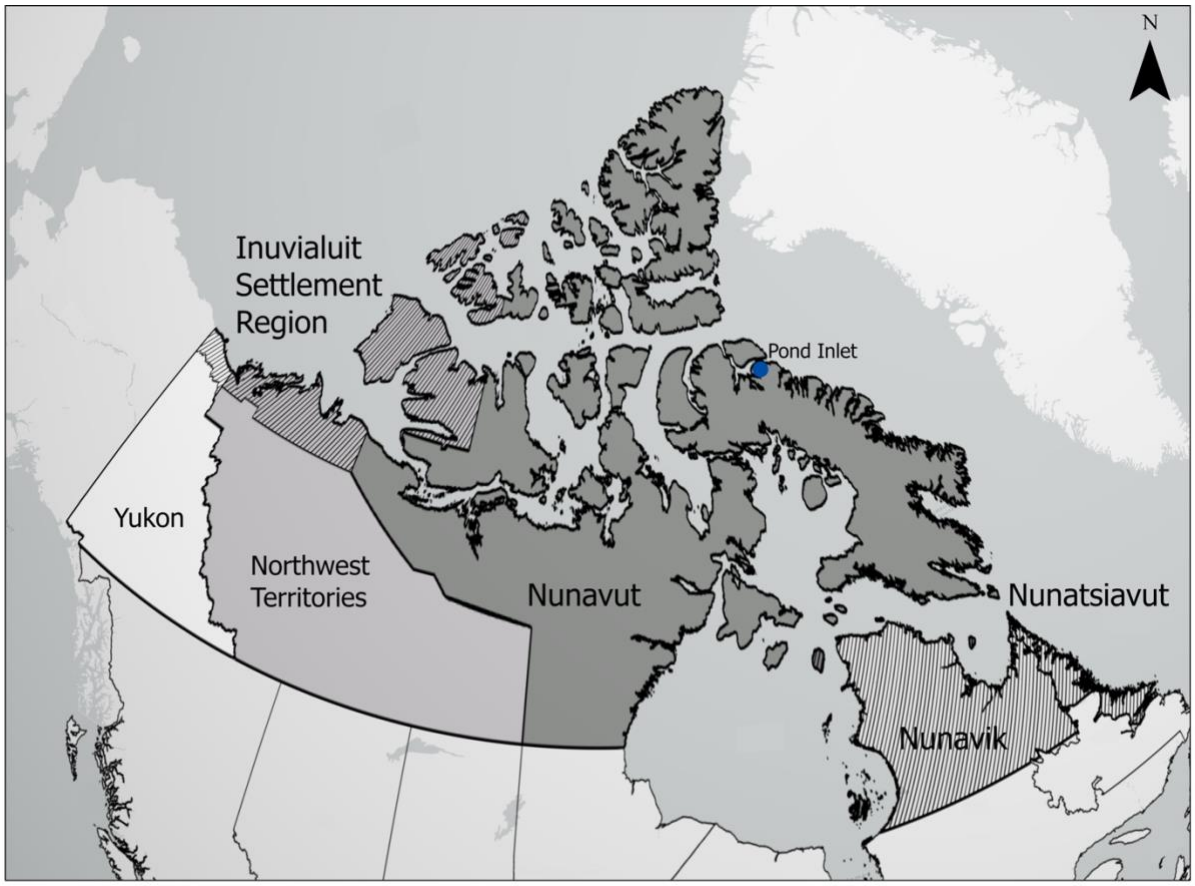

Figure 2. Canadian Territories of Yukon, Northwest Territories, Nunavut; and the Inuvialuit, Nunavik, and Nunatsiavut regions. Map data provided by the Canadian Geospatial Platform Services ArcGIS Online and ESRI, 2022.

Adapting to Climate Change

From the scholarly literature, one might define adaptation to climate change as simply: the capacity to change society's livelihoods and systems to continue functioning in a world altered by climate change (Levina & Tirpak, 2015). However, this term itself represents many different approaches to it. The Intergovernmental Panel on Climate Change (IPCC) defines adaptive capacity as "the ability of systems, institutions, humans, and organisms to adjust to climate change, moderate potential damages, take advantage of opportunities, or cope with the consequences" (2014:1758). Whereas the Organization for Economic Co-operation and Development (OECD) / International Energy Agency (IEA) defines as "a process by which strategies to moderate, cope with and take advantage of the consequences of climatic events are enhanced, developed, and implemented" (Levina & Tirpak, p. 7. 2006). Adapting to a world that has changed due to climate change is a contentious issue, particularly for poorer countries and Indigenous communities that inhabit areas that are being impacted at a much greater rate than more prosperous nations and non-Indigenous communities (Smith, 2021). One of the points of contention related to climate change adaptation is centred on the difference between the definitions presented above, where one focuses on preventing damages, and the other suggests a more transformative or developmental position (Cannon & Muller-Mahn, 2010). It can be argued that development aims to improve living conditions, whereas adaptation aims to maintain the status quo (Cannon & Muller-Mahn, 2010). Additionally, contention exists in the different interpretations of terminology, governance structures (local government vs. territorial or federal), and contextual differences (Solecki, Leichenko & O'Brien, 2011). Both adaptation and development efforts can also be seen as a form of colonial development that aims to further

colonize Indigenous people from the financial and economic powers that lie within the developed world that are dominated by colonial structures and institutions (Cannon & Muller-Mahn, 2010; Santos & Mourato, 2021).

It is evident that climate change is a complex phenomenon to understand, anticipate and adapt to. In an environment such as the Arctic, that level of complexity is far more intense. Academics such as Doering et al. (2022) call on an interdisciplinary approach that works collaboratively with Indigenous people and researchers to develop high-quality research outcomes that consider and respect the colonial legacies and power imbalances between Indigenous people and researchers. Social scientists, generally, are well positioned to work collaboratively with natural scientists and Indigenous communities to co-design and co-develop adaptation mechanisms (Huntington et al., 2007; Suzuki, 2020).

It is necessary to address that many Indigenous people, scholars, and communities have strong reservations against research, particularly anthropology, due to a long-standing history of colonial practices, manipulation, and theft (Smith, 2021; Grande, 2015; Liboiron 202, and Kovach 2021). I argue that one of the ways to develop a community or regional climate change adaptation program is to bring community members, researchers, politicians, Elders, and youth together to determine what area(s) of a community are under threat from climate change. Then by using an interdisciplinary framework, combining multiple knowledge systems to work collaboratively to develop a program that allows for a culturally appropriate adaptation while promoting the sustainable and respectful preservation of community that is under threat. While Settler research may acknowledge IK systems and attempt to combine said knowledge collaboratively, there have been critiques of the efforts thus far. For example, Inuit scholar Pitseolak Pfeiffer, in his article “An Inuit Critique of Canadian Arctic Research,” discusses how

research in the North of Canada continues to exclude Indigenous Knowledge. He states, “Arctic research continues to operate in a colonial framework and with an academic mindset that largely privileges the interests of southern institutions and fails to address Northern societal needs and issues, in particular, those experienced in Inuit communities (Pfeiffer, p 29, 2018)”. He recognizes that efforts have been made to include Inuit in research but argues that efforts need to go further to empower communities and individuals to obtain funding and conduct their own research based on their knowledge systems and methodologies (Pfeiffer, 2018). There are organization in Canada such as the Inuit Tapirit Kanatami that works to advance the concerns of Inuit living in the northern territories of Canada and advocates for policy changes that improve socio economic conditions.

Northern Canadian Political Responses to Climate Change

Due to Nunavummiut concerns and suspicions of conventional research and its often-colonial approach, the Inuit Tapiriit Kanatami (ITK) has developed its own strategy that advocates for changes at the regional, territorial, and federal levels. ITK, represents Inuit from across Canada, has developed a “National Inuit Climate Change Strategy” that echoes the need for a better understanding of climate change and stresses a coordinated effort of domestic and international partners to understand and adapt to the impacts of climate change (ITK, 2019). The strategy outlines five key priorities: 1) knowledge and capacity-building; 2) health, well-being, and the environment; 3) food systems; 4) infrastructure; and 5) energy (ITK, 2019).

Similarly, the Yukon government has developed its “Science Strategy” that outlines goals for centring Settler and IK to address current and future needs. The six goals are to 1) support

decision-making; 2) build science capacity; 3) improve data collection and management; 4) stimulate private and civil sector science; 5) promote information sharing; 6) manage and enhance science conduct (Yukon Government, 2019).

Like the Yukon Government, the Government of the Northwest Territories has implemented several science strategies, the most recent being the “2030 NWT Climate Change Strategic Framework.” This framework stresses the need for greater research and monitoring while using traditional knowledge to understand and adapt to climate change (NWT, 2022). The goals of the “2030 NWT Climate Change Strategic Framework" are 1) to reduce greenhouse gas emissions by 30% below 2005 levels by 2030; 2) improve knowledge of climate change impacts; 3) build resilience and adapt to a changing climate (NWT, 2022).

It is useful to look at these three policy documents and understand how they are all similar and different. The ITK “National Inuit Climate Change Strategy” was developed by an Indigenous governing body whereas the “Yukon Science Strategy” and “2030 NWT Climate Change Strategic Framework” were produced by Settler governing bodies. The primary differences in these documents are the specificity of what the strategies call for and goal setting. The ITK strategy outlines calls to action to address local needs, such as food security and infrastructure improvements. In contrast, the Yukon strategy identifies priority areas and not necessarily specific goals. What all three of these documents have in common is supporting greater science and knowledge capacity; they all aim to understand better and adapt to the changing climate, and both Indigenous and Settler governments agree on many approaches. These strategies are not in conflict with each other. In fact, they are complementary and stress the need to work together to adapt to climate change. There is a need for a strong coordinated effort to increase knowledge production that brings together multiple forms of knowledge and

provides sustainable and long-lasting solutions to adapting to a changing climate in the North of Canada.

Multiple Knowledge Systems: A Call Towards Collaborative Interdisciplinarity

As research on climate change increases, interdisciplinary approaches are necessary to develop adaptation solutions for the communities most impacted. Interdisciplinarity as a concept and approach is not new; it can be traced back to the 1920s (Jacobs & Fickle, 2009). Definitions of interdisciplinarity range in scope and size and are limitless as it is ever-evolving (Graff, 2016). In basic terms, interdisciplinarity can be defined as the "integration of knowledge originating in two or more fields" (Jacobs & Fickle, p.45, 2009). A more robust definition of interdisciplinarity is "the scholarly practice of interdisciplinarity depends on the ability to use knowledge, theories, questions, methods, understandings, and the like from more than one disciplinary area or field to fashion a new and different approach to a question or problems, large or small, theoretical, or applied (Graff, p.788, 2016). A more practical thinking of how to define or apply interdisciplinarity might be as sociologist Guy Michaud states, "interdisciplinarity is perhaps first and foremost a practice, interdisciplinarity cannot be learnt or taught, for it is a way of life. It is basically a mental outlook which combines curiosity with open-mindedness and a spirit of adventure and discovery" (CERI p. 285, 1972).

Interdisciplinarity, at its core, should be flexible and adaptive, encompass different forms of knowledge, approaches, methods, and methodologies, and find connections between and apart from the various interrelationships (Graff, 2016). In terms of applying an interdisciplinary approach to climate change, it is necessary to break down the various barriers between academic

disciplines, such as physical science vs. social science and applied vs. formal. Additionally, there needs to be a leveling between forms of knowledge, such as Settler vs. Indigenous and scientific vs. local. Settler scientific knowledge can be understood as a methodology that is reductionist, analytical, objective, and distant (Mazzocchi, 2006). Indigenous scholar Linda Tuhiwai Smith states, "In research, the concept of distance is most important as it implies neutrality and objectivity on behalf of the researcher" (Smith, p. 63, 2020). Feminist scholar Donna Haraway states, "objectivity and the scientific method are particularly bad guides to how scientific knowledge is actually made" (Haraway, p. 184, 2020). However, Haraway does not completely reject the notion of objectivity but suggests that a partial perspective is necessary to offer an "objective vision" (Haraway, p. 190, 2020). The idea of this objective vision is to embrace "politics and epistemologies" that reject a universality of one "true" or "pure" science and knowledge systems and instead encourage a "partiality" that includes our location, multiple connections, and critical positioning (Haraway, pg. 195, 2020). Haraway calls for the recognition that many factors, such as language, perspectives, and institutional structures, influence knowledge. Settler science needs to embrace different knowledge systems, such as local and IK (and vice versa) and should be comfortable with being what Haraway calls "an unequal structuring." This unequal structuring challenges the typical process where one knowledge system leads over others, typically Settler science (2020).

Combining these knowledge systems is not without its challenges. As Haraway states, "their combination is both contradictory and necessary" (Haraway, p.187, 2020). Indigenous scholars have called for the combination of multiple knowledge systems to develop new awareness's and explorations (Settee, 2007; Battiste, 2021). Battiste discusses that there have

been advances with this combination of multiple knowledge systems in well-being and rebuilding from colonialism within the context of Indigenous communities (Battiste, 2007).

Deeply entrenched within Indigenous belief systems, IK involves the systematic observation of the living world and the physical world (Johnson et al., 2013). Similarly, the Inuit have successfully relied on their knowledge system, Inuit Qauijimajatuqangit (IQ), to survive in some of the most challenging environmental conditions on the planet (Ashford & Castleden, 2001; Inuit Tapiriit Kanatami, 2018; Simeone, 2008). IQ is informed by Inuit societal values and includes systematic environmental observations (Pedersen et al., 2020). Inuit have relied on IQ to predict and explain changes occurring in the environment, such as the ability to travel on sea ice and land. However, the ever-increasing effects of climate change in the region have rendered IQ less reliable than in past decades (Ashford & Castleden, 2001; Bell et al., 2015). Arctic Indigenous people, researchers, and decision-makers have called for a better understanding of how climate change is and might impact the environment by integrating various knowledge systems to understand better human-environmental relations (Arruda & Krutkowsky, 2017; Stepien et al., 2014; Evengard &Thierfelder, 2021; Ford et al., 2021). Kawerak Inc, which is a consortium of 20 Alaska Native tribes in the Bering Strait region along with three other organizations representing dozens of Indigenous communities, has stated, “For many decades, we have asked to be active partners with agencies and academics that wish to come onto our lands and waters to conduct research” (2020).

Climate change can be regarded as one of our society's most serious challenges due to its complexity and unknown implications (McCright et al., 2009). For climate change adaptation programs, a locally informed assessment of various vulnerabilities can lead to the avoidance of poorly executed plans that might introduce new problems (Schipper, Dubash & Mulugetta,

2021). Utilizing an interdisciplinary approach to climate change has political implications that can add another layer to its complexity. At its root, an interdisciplinary approach needs to acknowledge and respect multiple knowledge, be collaborative and respect the relationship between humans and the ecosystem while rejecting academic Settler privileges by challenging the ongoing colonial oppression (Schipper, Dubash & Mulugetta, 2021; Todd, 2016). An example of a group that encompasses multiple knowledge systems, collaboration, and the dynamics between humans and the ecosystem is the Arctic Council.

When broadly examining the political forces in the Arctic, it is important to discuss the role of the Arctic Council, what it does, and point out its strengths and weaknesses. The Arctic Council is an intergovernmental forum that was created in 1991, which coordinates and promotes interaction between Arctic States (Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and the United States), permanent participants (Indigenous organizations), working groups, and observers. The council is informed and promotes activities that reflect the IPCC climate change assessments, as demonstrated by the various working groups and their activities. The working groups have been focused on environmental change, sustainable development, and maintenance and protection of biodiversity across all Arctic countries. There are six Indigenous organizations[1] that act as Permanent Participants on the Council, and they each represent their peoples and

[1] Aleut International Association; Arctic Athabaskan Council; Gwich'in Council International; Inuit Circumpolar Council; Russian Association of Indigenous Peoples of the North; and the Saami Council.

concerns. There are six working groups[2] that conduct the primary research and monitoring for the Council. And thirteen non-arctic States hold Observer status on the Council and several intergovernmental, interparliamentary, and non-governmental organizations (Arctic Council, 2021). The Arctic Council can provide a full examination of the current condition of the Arctic as well as recommendations that can be used to alter current challenges brought on by climate change. During my ethnographic research, many community leaders, researchers, and political figures believed the Arctic Council would provide a voice and recommendations to the Arctic nations that address current and emerging needs. The research and data collected, compiled, and synthesized by the Arctic Council is of tremendous value. However, the Arctic Council cannot implement any of its recommendations; it comes down to the political will of the Arctic nations to act. Concerns have been raised about the representation or lack thereof of northern residents on the council, including several Indigenous communities. One way that the Arctic council could push for greater representation and encourage political will would be to find a way to organize the various climate change efforts connected to Arctic communities into a more organized and representative effort. The Arctic council could also utilize and promote greater use of interdisciplinarity that is inclusive of IK and participatory Settler research.

We must foster ways to move forward and work together as social and natural scientists, politicians, and IK holders, as it is seen as necessary for gaining a stronger understanding of the

[2] Arctic Contaminants Action Program; Arctic Monitoring and Assessment Programme; Conservation of Arctic Flora and Fauna; Emergency Prevention, Preparedness and Response; Protection of the Arctic Marine Environment; and Sustainable Development Working Group.

effects of climate change so we can collaboratively develop adaptation strategies (Crate, 2011; Pellow & Nyseth Brehm, 2013; Zehr, 2015). There are many frameworks in which this collaborative research in climate change can take place, such as community-based research or monitoring that supports an interdisciplinary approach that equally works with Settler and Indigenous science (Dickinson, Zuckerberg, & Bonter, 2010; Murphy et al., 2016). During the last few decades, collaborative interdisciplinary research programs have grown in remote regions like the North of Canada to understand and adapt to global climate change (Dickinson, Zuckerberg, & Bonter, 2010; Kouril et al., 2016; Pollock & Whitelaw, 2005). Interdisciplinarity, the benefits of interdisciplinary collaboration, and the need for stronger data collection are all factors contributing to the growth of these programs (C. C. Conrad & Hilchey, 2011; Ford, et al., 2018; Bols (2017). The growth in this approach can be attributed to the recognition that research and action are quickly needed at multiple scales (Cundill, Currie-Alder & Leone, 2019). Supporting the growth in this research approach is the financial investment made by governments in Canada, the United Kingdom, and the Netherlands, which have collectively invested over $300 million over the past ten years (Cundill, Currie-Alder & Leone, 2019). There are inherent challenges to engaging in interdisciplinary collaborative research that can be categorized into three key areas: transferability, integration, and scalability (Reyes-Garcia, 2019). The issues around transferability come into play with different forms of data, such as qualitative vs quantitative and Settler knowledge vs IK (Reyes-Garcia, 2019). One possible way to integrate climate change data is to create categories that can then be organized into different subfields. These subfields could include citizen observations or typical phenomena. Over time the data in these categories can show observed changes over time. The process of integration is complex, but by breaking down specific foci, it can be easier to see which areas can be integrated

and which will require further development (Reyes-Garcia, 2019). There are several large-scale natural science datasets related to climate change, and while this is extremely important the challenge inherent to this is scalability (Reyes-Garcia, 2019; Moss et al., 2010). One of the ways to address this challenge can be through what Reyes-Garcia calls the "creation of a community of practice that considers the need to effectively downscale global models…" (Reyes-Garcia, p.2, 2019). One of the critical points is that researchers are not the only ones disseminating this knowledge; it is being spread out to a wider community. Breaking down these models into the regional or community scale can facilitate the development of local adaptation programs.

Engaging communities across the North of Canada in developing climate change adaptation programs is no easy venture. It is understood that active engagement, early consultation, collaborative research designs, and clear goal setting are key to successfully developing climate change adaptation programs (Pearce et al., 2009; Pedersen et al., 2020; Vlasova & Volko, 2016). Pearce et al. state that despite the challenges of developing these programs, "researchers have a practical and ethical responsibility to engage with communities (p.10, 2009). One of the initial steps in the development of a climate change adaptation program is assessing local vulnerability and adaptive capacity through a collaborative process these programs will likely be successful if there have been community members involved in the design, implantation, data collection and dissemination of the results (Pearce et al., 2009). Working together and collaboratively on climate change adaptation programs is underway as it is seen as vital and immediate urgency as communities across the Arctic are experiencing the impacts of climate change. Taking the key considerations into account, creating a guide of best practices, and working across disciplines and knowledge systems can lead to relevant and useful adaptation programs.

The role of academia in building climate change adaptation programs

There can be a role for every academic discipline and form of knowledge in developing an interdisciplinary collaborative climate change adaptation program. By taking the lessons learned and listening to the voices of community members in the North of Canada, it can be argued that there can be even greater development of climate change adaptation programs that address local vulnerabilities, build skills, and facilitate resiliency (Zehr, 2015; Gerin-Lajoie, 2018; Goforth, et al. 2021). Although there are some adaptation projects in place across the North of Canada, what is missing is an understanding of how current and future projects can be successfully co-designed in a way that respects (and prioritizes) Indigenous communities' calls for a change in the colonial practices inherent in research. Colonial approaches to research are demonstrated when Indigenous people and communities are not part of decision-making, such as setting research agendas and determining how data and information are collected, used, and stored. One of the calls to change is to ensure that Indigenous communities have access, ownership, and control over data and information (Carroll, Rodriguez-Lonebear, & Martinez, 2019; Inuit Tapiriit Kanatami, 2018). This call to change is reflected in the ITK "National Inuit Climate Change Strategy", Yukon Government "Science Strategy," and NWT "2030, Climate Change Strategy Framework". I present the findings from my case study that took place in Pond Inlet, Nunavut. The analysis of this case study has led to a set of 'best practices' criteria that may be applied as a set of indicators for the successful development, implementation, and sustainability of adaptation and mitigation projects. I conclude with recommendations for ways in which communities and social and natural scientists can work collaboratively to co-design and

develop adaptation projects that meet the emerging needs of these communities in the face of a changing climate.

There is a wide range of stakeholders working on climate change adaptation projects, including policymakers, engineers, health workers, and territorial and federal governments. Some projects are cross-disciplinary such as the "SEARCH: Study of Environmental Arctic Change- A System- scale, Cross-disciplinary, Long-term Arctic Research Program" (Wiggins, Schlosser, & Fox, 2009), which looks at overall climate change effects across the Arctic. Local-level projects include the Canadian (Sea-ice Monitoring and Real-Time Information for Coastal Environments) SmartICE program, which aims to work with Inuit communities to assist in finding ways to adapt to the unpredictable warming of sea ice (SmartICE, 2020).

The development of adaptation programs to understand and respond to the effects of anthropogenic climate change in remote regions such as the North of Canada has been growing over the past two decades (Dickinson, Zuckerberg, & Bonter, 2010; Kouril, Furgal, & Whillans, 2016; Pollock & Whitelaw,"05). The growth of these programs can be attributed to the growing demand for an enhanced holistic understanding of the relationship between humans and the environment, the need for more robust data, the growing stress on IQ from climate change, and the cutback in government monitoring programs (Alexander et al., 2011; Bell et al., 2015; Conrad & Hilchey, 2011; Mustonen & Lehtinen, 2013; Pollock & Whitelaw, 2005; Riseth et al., 2011). Across the Arctic, climate change has stressed the ability of IQ to be a reliable source of knowledge for Inuit that is utilized for such activities as procuring food and engaging in cultural practices. There has been a growing interest in developing adaptation programs that can be augmented with Settler science to support community well-being and protect food security (Barnes et al., 2013). One of the challenges in developing these programs is the paternalistic and

colonial history of science and government (Coulthard & Alfred, 2014; Deloria, 1973). Understanding and acknowledging this history has required researchers to work on ways to decolonize their research design approaches and work collaboratively with Indigenous communities (Keenan, 2015). Max Liboiron has outlined a decolonizing framework in their CLEAR Lab Manual that discusses topics such as, values, decolonization, rules, empowerment vs. participation, Indigenous science vs. decolonial science vs. anticolonial science, etc., (CLEAR, 2021). There are growing efforts to develop programs collaboratively that incorporate IQ with the natural and social sciences (Cruikshank, 2001; Pedersen et al., 2020; Wiseman & Bardsley, 2016).

Another challenge in developing these programs is recognizing that each knowledge system offers varying perspectives that must be handled equitably. Inuit communities have expressed concern that their knowledge needs to be adequately documented, and not taken out of context, or not used at all (IASC, 2013; Inuit Tapiriit Kanatami, 2016; Johnson et al., 2015). Combining Settler science and IQ is not easy, perhaps not genuinely possible as efforts to combine the two have been met with skepticism and frustration as the differing ontologies are often seen as dichotomist by their very nature (Briggs, 2005). Haraway's critique of the dominant Settler scientific understanding of objectivity brings attention to the fact that combining entire knowledge systems does not lead to more explicit scientific understandings. She argues that partial perspective of knowledge systems can provide an "objective vision" (Haraway, p.191, 2020). Settler science often is viewed by Indigenous people as reductionist, objective, narrow, and "truth" seeking (Deloria, 1969; Nadasdy, 2003; Pulsifer, Laidler, Taylor, & Hayes, 2011), whereas IQ is considered holistic, subjective, and a means to understand various broad ecological and social patterns and interactions by Indigenous people and many social

scientists (Julie Cruikshank, 2005; Nickels, Shirley, & Laidler, 2007). Further arguments about Settler science and IQ being combined illustrate that the process of Settler nature uncovering 'facts' strips away the rich information that IQ provides (Deloria, 1969).

Another critical argument that needs to be addressed is the idea that Settler science when combined with IK can erode or further stress that knowledge system (Ludwig & Macnaghten, 2020 & Abanyam, 2013). Throughout my dissertation, I point out that there have been and continue to be various phenomena that stress IK systems such as climate change and colonialism. Ludwig and Macnaghten would support my argument and add that the introduction of the wage economy, migration away from communities and regions, and changing social structures further stress IK systems (2020).

The argument exists that Settler science can erode IK systems because these two epistemologies are often thought of as incompatible and the imperialistic nature of Settler science has a pervasive and dominating presence that is further compounded by colonial relations (le Grange, 2004; Berkes, Colding & Folke, 2000). In fact, Abanyam argues that most Indigenous communities have developed a dependence on Settler technology, which erodes cultural practices, values, and knowledge sharing (2013).

However, other scholars, myself included, would argue that Settler science and technology can and has been used to support Indigenous cultural practices, knowledge sharing, and land-based learning, which slows and averts further loss of IK (Wilson, et al.,2021; le Grange, 2004; Berkes, Colding and Folke, 2000). As I have discussed previously, SmartICE was a project that came out of Inuit Elders and hunters asking for Settler technology to help support the cultural practices of harvesting animals during times of the year when sea ice thickness is no longer predictable with their Inuit knowledge system. Furthermore, IK systems are dynamic and

ever changing and if communities and local leaders desire to introduce Settler technology into their practices then it is their choice to do so and our role as Settler researchers could be to support those requests.

Conversely, IQ has been fraught with misunderstanding and a lack of equal respect. It is often considered anecdotal, subjective, and lacking in rigor by Settler science, thus not being utilized in Settler governance structures (Ingold, 2000; Nadasdy, 2003; Sillitoe, 1998). The struggle to fully incorporate IQ into Settler science, particularly environmental monitoring, and policy, runs parallel to the continuing Inuit struggle for recognition and self-government (Inuit Tapiriit Kanatami, 2016; Pedersen et al., 2020). I believe that through an interdisciplinary approach and community invitation, Settler researchers can take an important role in the facilitation of building climate change adaptation programs in communities in the North of Canada. Changing how research funding structures currently are in place that would allow Inuit communities to apply for funding is of paramount concern (Coulthard & Alfred, 2014; Deloria, 1973; Inuit Tapiriit Kanatami, 2016, 2018).

Examples of adaptation programs

In this section, I outline two adaptation projects in different parts of the Arctic designed to help Indigenous communities and peoples face a changing climate. By breaking down these two programs, I intend to show the similarities and differences in the design, approach, goals, and outcomes to promote the more significant development of more programs in the North of Canada. One of the commonalities across these programs is that the Indigenous people and

communities involved set the research priorities and guide each program's direction. Another commonality is that these programs have sustainable government funding and a platform to continue developing innovative partnerships to tackle real-life challenges.

The SnowChange Cooperative

The SnowChange cooperative started in Finland during the early 2000s and develops and conducts research projects, write policy, and advocates for Indigenous issues such as loss of wildlife and land, and promotes IK in climate change adaptation. SnowChange is trailblazing in its work to find solutions to the damaging effects of climate change and human actions; it has become a major international organization that has developed climate and Indigenous policy and research (Gaia Foundation, 2021; SnowChange, 2021). SnowChange is funded by several sources, including the National Science Foundation in the United States, several Ministries of Finland, and the Nordic Council of Ministers (SnowChange, 2021). SnowChange has produced international workshops and partnerships, books related to oral histories, and community monitoring programs.

The Cooperative has coordinated knowledge mobilization for the Arctic Biodiversity Assessment, which is one of the working groups of the Arctic Council. It has also implemented a green energy infrastructure in several communities (SnowChange, 2021). One example of the environmental work from the SnowChange Cooperative is the Näätämö project, located in northern Finland. The Skolt Sámi have been working on this community-based monitoring program to restore what was once a vital salmon spawning area in the Vainosjoki river, which is fed from the larger Näätämö River basin. One of the projects is to restore salmon stocks by

allowing the Sámi fishers to set the catch limits, relying on their knowledge system for guidance (SnowChange cooperative, 2022). SnowChange has been regarded as a widely successful program for its documentation of IK and for empowering locals, particularly youth and Elders, to respond to climate change while protecting and promoting their cultures (Mustonen et al., 2011). SnowChange has been at the forefront of this effort with its publication "*Eastern Sámi Atlas*" (Ingold, 2013), which included oral histories, written information, and photographs of the salmon fishery in the basin and other traditional practices (Gertz, 2015). As a result of their work, the Cooperative has been awarded many environmental and human rights awards, such as the St. Andrews Prize for the Environment in 2021 for its work on the restoration of the salmon fishery in Finland. SnowChange has effectively found solutions to the damaging effects of climate change and human actions by restoring wetlands and natural areas that have been damaged due to industrial activities (SnowChange, 2021).

World Reindeer Association

Reindeer herding is not only a means of harvesting country food and traditional clothing; it is also a fundamental expression of culture that utilizes traditional knowledge and language (Jacobsson, Stoor, & Eriksson, 2020). Across Norway, Sweden, Finland, Russian, Mongolia, China, Alaska, Canada, and Greenland, reindeer herding is practiced by more than 20 different ethnic groups (Association of World Reindeer Herders, 2021). In 2005, the International Centre for Reindeer Herding (ICR) was established and funded by the Norwegian Government to work in cooperation with the various reindeer herders across the circumpolar Arctic. According to the ICR website, the purpose of the organization is to: "Contribute to maintaining and developing

sustainable reindeer husbandry in the north, strengthen the cooperation between the reindeer herding peoples, document and take care of the traditional knowledge of reindeer herders and contribute to knowledge development, communicate knowledge about circumpolar reindeer husbandry to our target groups" (2021).

While climate change affects regions where reindeer exist, the biggest threat to the species and reindeer herding is primarily human activity, such as military and mining activities and pipeline development (Association of World Reindeer Herders, 2021). The ICR works with various reindeer herders across the circumpolar Arctic and has contributed to organizations such as The Arctic Council and the World Indigenous Nations' Higher Education Consortium (Association of World Reindeer Herders, 2021). One of the many outcomes of the Association's work is the Mallu project; endorsed by the Arctic Council Sustainable Development Working Group, the project aims to understand food culture by utilizing traditional knowledge, engaging youth, and determining adaptation to climate change (Association of World Reindeer Herders, 2021). These two interdisciplinary climate change adaptation projects are led by Indigenous people, their communities, and their knowledge systems.

Large-scale interdisciplinary collaborative programs are happening across the globe and in the Arctic region. The above examples provide insight into various programs and illustrate their different approaches. In the following section, I will detail my observations conducted during my ethnographic research in Pond Inlet, Nunavut on a climate change adaptation program called SmartICE.

CASE STUDY

Pond Inlet ᑎᕐᓂᒪᒃᑯᓪ (Mittimatalik: ‘the place where the landing-place is’) is an Inuit community on Northwest Baffin Island in the territory of Nunavut and located in the Qikiqtaaluk Region (Figure 3). The population of Pond Inlet was 1555 (93% of residents identifying as Inuit) as of 2021 (Government of Canada, 2022). Pond Inlet was the first community to enter into negotiations with the Federal Government for land ownership in 1990, which led to the proposed North Baffin National Park (Fenge, 2001). Inuit from Pond Inlet were particularly interested in obtaining ownership over Bylot Island as it has been a source of hunting, fishing, and trapping for many years (Fenge, 2001). Pond Inlet has been a point of interest of European Settlers since the early 1900s (Qikiqtani Inuit Association, 2013). The Hudson’s Bay Company, Royal Canadian Mounted Police and both the Roman Catholic and Anglican Churches quickly established themselves in the community (Qikiqtani Inuit Association, 2013). Due to the easy access to the ocean in the summer months, rich mineral deposits, and diverse species habitat the community has been of great interest to researchers, governments, and capitalist ventures (Qikiqtani Inuit Association, 2013). In the early 1960s the Department of Northern Affairs and Natural Resources invested in local infrastructure, which provided heated garages, classrooms, a hostel, walk-in freezer and a two-bedroom house (Qikiqtani Inuit Association, 2013). This was part of a larger plan by the Crown to centralize Inuit populations, introduce English-language schooling and introduce a wage economy (Qikiqtani Inuit Association, 2013). It can be argued that these Settler colonial actions lead to a greater level of dependence on store bought food, wage subsidies, and decreased political power to prevent Settler colonial actions such as mining activity and Settler research. The Settler research environment in Pond Inlet is thriving which is

evident with increased research funding and the building of physical infrastructure such as the Environment and Climate Change Canada research station which was opened in 2017 (Government of Canada, 2017). It is likely that Pond Inlet will continue to be a hub for Settler research and economic activity. It is my hope that this chapter will provide specific ways in which Settlers can and should engage with Inuit are collegial, collaborative and addresses the needs and concerns of the community.

In the spring of 2016, I traveled to Pond Inlet to meet with residents and speak with local organizations including the Hunters and Trappers Organization (HTO), Hamlet Council, and Ikaarvik. The HTO is a local organization representing traditional harvesters in and around Pond Inlet. The organization meets regularly to discuss research projects which have asked for their advice or partnership. They also discuss and vote on other pending local or regional projects related to harvesting or traditional practices. Ikaarvik is a youth program that bridges Settler research with IQ and local communities. I wanted to determine if there was an interest in the community to understand how researchers can engage with the community. It was clear that residents were interested in this as I repeatedly heard that they wanted to know why researchers continue to come to the community and region and mostly fail to hire locals or report their findings.

Figure 3. Picture of Pond Inlet, Nunavut. Photo Credit: Kent Spiers, March 2018

During my visit, researchers with the Sea-ice Monitoring and Real-Time Information for Coastal Environments (SmartICE) project arrived in the community to talk about how their project could support IQ with Settler science in the face of rapid climate change; they also indicated that the project could be community-led and operated. At that time, I was not conducting interviews. I was making connections with community members and talking with Ikaarvik about how best to execute my project. Fortunately, I was able to attend meetings where the SmartICE project personnel spoke with various community organizations and residents about the project. I took extensive field notes of residents' questions, conversations with them, and observations about the events.

SmartICE was developed to augment and complement IQ for safe sea-ice travel. It was first introduced as a pilot project in Nain in Nunatsiavut in 2013 and Pond Inlet, Nunavut in 2015 (Bell, Briggs, Bachmayer, and Li, 2015). It has now spread across many communities throughout the North of Canada. SmartICE attempts to deliver real-time sea-ice measurements for hunters and trappers to safely navigate sea ice to utilize traditional hunting and trapping grounds. Of great significance to Inuit people, sea ice is a pathway to access traditional food and pass on IQ (Laidler et al., 2009). SmartICE uses several sea-ice and land-based sensors that create a network across a specific geographical area. The sea-ice sensors are drilled into the ice and then collected in the summer when the ice has melted. The land-based sensors are pulled along in a qamutiik (sled) by a snow machine over the sea ice, which uses the salinity of the water to measure the distance between ice and water. This series of sensors can take real-time measurements, which are sent to a satellite and then delivered back to the community within 24 hours in the form of

maps to the Hunters and Trappers Organization (HTO) offices. SmartICE has continued to spread into other communities across the North of Canada, now employing 33 youth and having trained 46 operators; the Government of Canada has committed funding to help with the continued distribution (Patar, 2020). The communities are active in almost all aspects of the project, from operations to research and, ultimately, to decision-making (Bell et al., 2015). This program has received national and international recognition and awards: the Canadian Governor General's Innovation Award in 2019, the 2017 Momentum for Change Award (awarded by the United Nations), and the Arctic Inspiration Prize (awarded by a Canadian Charitable trust) in 2016 (SmartICE, 2020). SmartICE was supported by residents, the HTO, and Hamlet Council as they felt that the program would respond to local needs and incorporate the community in the ways they felt were appropriate.

In 2017, I traveled back to Pond Inlet to conduct my fieldwork, and in another stroke of good timing, I arrived in the community while SmartICE was being deployed. I was allowed to accompany the SmartICE personnel and community members in learning how the project works and how to troubleshoot potential issues with the various sensors. As I was conducting my interviews, it was interesting to notice how many participants talked about SmartICE in detail, even when they were not directly involved in the project. This is important as it demonstrates that the SmartICE team's approach to communicating the project was made in a way that was understandable to the audience and likely facilitated dialogue between community members about the project. The approach and design of SmartICE are worth understanding for current and future adaptation and mitigation programs to be successful and align with community needs.

METHODS

In this section, I describe the case study that led to a greater understanding of how the climate change adaptation project (SmartICE) integrated into the community, leading to a set of community-specific guidelines for engagement. I used an exploratory qualitative analysis approach (Srivastava & Hopwood, 2009) to describe the effects that SmartICE has had on community participants from Pond Inlet, Nunavut, concerning facilitating conversations about meaningful and respectful engagement from researchers. This approach is situated in real-life concerns about adapting to climate change and Inuit experiences and research perspectives (Huntington et al., 2007; Nickels et al., 2007). Qualitative analysis is naturally inductive as the data's various themes, codes, and patterns emerge. I understand the role of a qualitative researcher to be that of a storyteller (Srivastava & Hopwood, 2009), I aimed to detail specific aspects of the approach used by SmartICE that facilitated community engagement and buy-in, in hope that other similar programs might utilize these best practices.

I used an exploratory qualitative analysis to guide this study and organized the data collection categories as follows: 1) field notes; 2) interviews with community participants; 3) and recommendations (centre for Innovation in Research and Teaching, 2020).

Field Notes

During the initial visit to Pond Inlet, I took descriptive field notes each day, sometimes two or three times, depending on my interactions and observations. (Chan, 2009). I found it helpful to follow the recommendations by Grey (2004) on taking detailed field notes (Table 1) as they helped keep me focused, see preliminary themes, identify potential ideas for further analysis, and help construct future interview questions.

Table 1. Components for taking comprehensive field notes*		**How I applied these components in my research**
Primary observation – chronological log	Raw data of observations on people, surroundings, behaviors, and conversations. Each set of field notes is dated, and the time of occurrence is noted.	I took notes during meetings and noted the surroundings, participants' behaviors and topics discussed. The Dates and times of the meetings were at the top of each page.
Reflection and recall	Some of the reflections were stimulated from jotted notes, and some were recalled while writing up field notes. Sometimes objects or events did not seem important initially but were when recalled and when they occurred again.	At the end of each meeting, I would write initial thoughts about the meeting and if I could recall connections between previous meetings or documented interactions. When I had time later in the day, I

		would review previous notes to confirm connections and often discover ones I could not recall.
Pre-analysis of data	Themes and insights started to emerge. I did not try to censor myself; I wrote down anything that occurred to me.	When subjects or similar phrases to topics would occur, I would document those to identify if there was a theme emerging.
Experiential data – impressions and personal feelings	Impressions and personal feelings can often be useful sources of analytic insight at a later stage. This included my interpretation of participants' emotional reactions, people, conversations, and my interpretation of emotional reactions.	If I identified similar reactions amongst participants to specific subjects, I would document that. I also documented the emotional reactions of participants and compared notes afterward to see if I came to a similar conclusion. For instance, negative community reactions to polar bear hunting.
Planning	This included future research, ideas for workshops, and possible ways to analyze the data.	During meetings, I would think of other research questions, workshops, or ways to interpret data. Ideas often occur at the

		end of the day when I re-read the notes, thought about the observations, and then wrote reflections.
*Source: David Gray "Doing Research in the Real World" 2nd edition, 2004, p.403-404.		

In 2016, I attended community group meetings during which SmartICE personnel talked about how the project would augment IQ. Residents and elected officials asked a few questions concerning how the project worked, who would run and own it, and who would have access to the data collected. It seemed to me that there was much skepticism around the project, especially concerning ownership. The SmartICE personnel explained in plain language how the project worked that the person operating the sensor-equipped snow machine would be a resident who would take their direction on where to travel from the HTO. The technology would enable the production of maps of where it was safe to travel. The community was assured of ownership; it was entirely in charge of where the sensors were placed and aware that the maps produced (within about 24 hours of the readings) would be made available only to the community. At the end of the week of meetings with SmartICE, the HTO and Hamlet office approved the project.

A year later, I noticed that community questions about SmartICE were no longer being asked in a way that questioned the applicability of the project for the community or its ownership. There was a sense of excitement about the project and how it would provide easy-to-follow maps for hunters and trappers while being guided by and supporting IQ, food security, skills development, and employment opportunities.

Interviews

I conducted (N=28) semi-directed interviews (Ashford & Castleden, 2001) with community members who had experience working with outside researchers, a majority of whom had worked on projects related to climate change understanding and adaptation (N=24). My fieldwork aimed to answer the research question, "what are the specific circumstances that facilitate meaningful and engaging relationships with community members and researchers?" During my first meeting with my research assistants, Maktar and Milton, I decided that an incentive was necessary to recruit participants. Initially, I planned to provide every participant with a gift card to one of the local grocery stores; however, that meant that each gift card was small in value ($5) and likely would not be a meaningful incentive. In my observations of the community, I noted the popularity of Friday night BINGO, drawings, and contests on the local radio. I concluded that, like in southern Canada, there was an active interest in gambling. With that in mind, I suggested to Maktar and Milton that perhaps pooling the gift card funds and a drawing for a higher value card should be done after all interviews were complete as it might yield more participation; it appeared to work because I had a sudden increase in individuals interested in conducting an interview.

All interviews were audio-recorded (with participants' permission), and I made notes during and after each interview. Participants signed consent forms, which included assurance of confidentiality. The University of Calgary's Conjoint Faculties Research Ethics Board (CFREB) approved the project (REB17-1416), and the Nunavut Research Institute issued the research license (02 027 18R-M). Participants were asked questions related to the nature of the research project they worked on, how they were recruited if they were compensated, if they relied on

skills they already had or whether their involvement facilitated the development of new skills, whether they felt that the project was relevant to the community, and their overall feelings about the experience (see Appendix 1 for interview script questions).

Semi-directed interviews provide an opportunity to ask probing questions when a participant mentions something that the researcher finds of interest. For example, in this study, most participants, directly and indirectly, expressed their feelings about various climate change adaptation projects in and around the community; during the interviews if a participant mentioned one of the adaption projects I would ask questions about their impressions of the project, if they were involved and if not why, and I asked if they felt the project would benefit the community. Interviews were conducted until a saturation point was reached; this was determined when the responses were no longer revealing new information. Upon the conclusion of each interview, I would offer a summary of key points that I heard from the participants to confirm accuracy. Participants were informed that if they wished to add, remove, or change any of their comments, they were free to contact me while I was in town or up to 12 months from the time of the interview.

I conducted a thematic analysis using the QSR International NVivo 12 qualitative software (QSR, 2018). The themes were categorically organized and coded using an inductive approach (Braun and Clarke, 2006). These codes were compiled and collapsed into themes using the triangulation method. There are different types of triangulations; for this study, I used method triangulation, which utilized interviews, observations, and field notes as sources to test and confirm the validity of my conclusions, which was done through the convergence of information from the various sources (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014). Method triangulation also involves an analysis of the associations across the field notes, relevant

literature, and the interviews. However, it is a profoundly reflective exercise that I found interesting. Table 2 depicts how Srivastava & Hopwood describe the process of reflexivity that I used (2009).

Table 2. Questions that served as the framework for the data analysis from Srivastava and Hopwood (2009)	
1	What is the data telling me? (Explicitly engaging with theoretical, subjective, ontological, epistemological, and field understandings)
2	What is it I want to know? (According to research objective, questions, and theoretical points of interest)
3	What is the dialectical relationship between what the data are telling me and what I want to know? (Refining the focus and linking back to research questions)

In part, the themes in Table 3 were foundational to the development of the expected behaviours and actions community members want to see researchers incorporate (see Table 4) that was further expanded on at the Ikaarvik summit a year later.

The goal of my fieldwork was not only to determine the specific actions/behaviours of researchers but also to articulate how anthropologists like me can assist in the development of climate change adaptation programs that facilitate communal ownership and community involvement in mind.

Table 3. Coded Themes from Fieldnotes (2016) and Community Interviews regarding SmartICE (2017)	
Theme	**Example from Field Note / Community Interview**
Ownership	Community members seemed skeptical about who owned the project. For example, during an HTO meeting, the President asked several times who owns the project, even saying, "the university owns it, right?"
Relevance	During the interviews participants talked about the need for projects to be relevant to the community. For example, SmartICE is relevant as it responds to an outcome of climate change affecting sea ice thickness.
Simple Technology	The technology used in these projects must be easy to use and straightforward when it comes to technological issues. For example, there was much concern around the technical knowledge required to operate the sensors and what to do if something is not working.
Knowledge Systems	The success of a project appears to rely on respecting IQ and appropriately incorporating it. For example, participants spoke about how their IQ dictates where the sensors are placed and where they send out the snowmobile with the sensor.
Data Sovereignty	Data collected in and around the community and region needs to be safeguarded. For example, questions were asked about who would see the data and who would have access to it as interview participants did not want data publicly available outside the community.

RESULTS

A total of (N=28) interviews were conducted; 20 of those had mentioned SmartICE in some capacity with either direct or indirect involvement in the project. The difference in awareness of the project between 2016 and 2017 was striking. In 2016, I was talking with the community about the project, and a year later, the project was well-known and highly praised by several residents. Table 5 highlights examples of the thematic analysis I prepared based on the participants' comments about SmartICE during the interviews and the coded themes from my 2016 and 2017 fieldnotes.

To help researchers understand the specific steps they should take when conducting research in or around communities in Nunavut, during the Ikaarvik summit (ScIQ) in the winter of 2018, a group of Inuit youth developed the information presented in Table 4. I was asked to co-facilitate during the summit to help the Ikaarvik youth articulate the expectations they have for researchers coming into their community and how IQ could be incorporated into the design of research projects. Our process for the summit was to invite the local Elders to the first-day session to talk about the purpose, elicit feedback and seek their permission to continue. The Elders that were in attendance blessed the summit and looked forward to hearing the results. On the last day of the summit, the Elders came back, and the Ikaarvik youth presented the results of their work, which was well received.

Table 4. ScIQ: An invitation and recommendations to combine science and Inuit Qauijimajatuqangit for meaningful engagement of Inuit communities in research. Pedersen, C., Otokiak, M., Koonoo, I., et al. 2020

Before arriving at a community
● "Get community buy-in and feedback from the beginning— Contact the Hamlet, Hunters and Trappers Organization, Heritage Societies, or others in the community to ensure your research will be welcomed and relevant. ● When writing funding proposals, ask for additional funds to visit and work with the community to develop your research questions and methods. ● Talk to as many organizations as you can in the community about meaningful ways to get the right local people involved in your work and how best to inform and engage the community as a whole in your research. ● Take the time to research where you are going—history, customs, culture, and language. ● Remember that English may be a second language for many community members and plan accordingly for interpretation and translation services. ● Have all your documents translated into the correct dialect of Inuktitut for the community or communities you intend to work with? ● If you need a letter of support from the community, ask for it well in advance. ● Be flexible when planning your research. Learn when good times to visit the community are and when is best not to come. For example, there are times when many people will be out of the community and on the land.

- If your work involves interviews or mapping, find out what work has already been done in the community to avoid repeating questions already asked of community members.
- If you are planning a field camp, please consider bringing your food. Buying your groceries in town may appear to benefit the community, but groceries are limited in town, and you could leave the community without the foods they need.

During a community visit

- Be a human first and a researcher second. Introduce yourself as a person, not as a set of credentials.
- First, make yourself known to the community--As soon as you arrive, visit, and introduce yourself to the Hamlet, Hunters and Trappers Organization, local radio. Go on the local Facebook page to let people know you are in town and participate in any community gatherings. Look for opportunities to be active in the community.
- Next, make your project known to the community—have a table at the Coop or Northern and talk to people, do a presentation at the Community Hall, go on local radio and Facebook to introduce what you are working on. This is a great opportunity to include community members that you are working with.
- Remember that English is a second language in many communities. Do not use jargon.
- Do not assume that people will understand why you are doing what you are doing or care about it. Be prepared to explain why it matters and have a conversation with people to learn how your research is relevant to the community.

- Know that not everyone can speak on behalf of the community. Different people have different experiences and expertise. Take the time to find out whom the right people to talk to are for the questions you wish to ask.
- Do not just ask the community to help you; ask how you can help the community.
- Plan to give back to the community—volunteer, do a public presentation, host a feast, etc.
- Become a teacher and a student—pass on your knowledge and learn from the community at the same time.
- Look for opportunities to work with the local schools or college - you can help inspire the next generation of Inuit researchers by sharing your knowledge and skills.
- Be prepared to bring cash for payment of stipends and honoraria.
- Be flexible when plans change. Accept and adapt to changes due to weather, community events (festivals, funerals, etc.), or equipment failures.
- Understand that there are many different dialects of Inuktitut and know which dialect people use before hiring an interpreter or having documents translated.
- Allow your Inuit guide to be in charge. When on the land, they call the shots. Trust that they have your best interests and safety in mind.
- We understand that you have timelines, deadlines, and budgets, but it is important to be flexible enough to work with the community's flow. Otherwise, your project may not fit with the community's pulse and people who are busy taking care of family, jobs, and their own needs.
- Involve the community in the interpretation of results and help determine the relevance of the results for the community.

- Be thankful for your guides, assistants, and local co-researchers, and let them know how much you respect and appreciate them.
- Communicate to the community about the research throughout, not just at the beginning and end, stay in touch via Facebook etc., to keep the community in the loop while continuing your work.
- Follow local, regional, and federal rules and regulations regarding archaeological and cultural resources. Do not pick up or take artifacts from the land.

After a research trip

- Pass on skills and knowledge so the community can continue the research after you have left.
- Credit and acknowledge the Inuit who worked with you and their community, not only in citations but also in the body of your work and presentations.
- Celebrate with the community by hosting a feast, presentation in the Community Hall, or other activities.
- Make sure anything that is left behind is translated into the appropriate Inuktitut dialect.
- Help other researchers to understand the community and how to engage them in a meaningful way.
- Share the beauty and history of the Arctic with the south. You are now a critical link between the North and South, and your experiences can help the rest of the country develop a better understanding and appreciation of this amazing place."

With programs growing in numbers and climate change adaptation programs growing across the Arctic and subarctic region (Pearce et al., 2009; van Vuuren et al., 2011), it is essential to consider potential ways to evaluate the success of these programs. Brooks, Waylen, and Mulder (2012) offer four characteristics: Social Capital and Participation, Equity, Increase Capacity, and Engagement. These can be useful in determining appropriate indicators that can be implemented to measure program success. Social Capital and Participation are when communities participate in project initiation, establishment, and management (Brooks, Waylen and Mulder, pg. 21265, 2012). This could be measured by tracking the number of community members that are involved in the process and if positions for the project are occupied by locals. There could also be regular surveys and focus groups to determine general feelings toward a project. It is important to highlight that a considerable amount of local involvement can also suggest that there are extremely laborious demands for a project, which can result in community burden and burnout.

Equity is fostered when the benefits are equitably shared (Brooks, Waylen, and Mulder, pg. 21266, 2012). This can be measured and demonstrated by carefully documenting the benefits of a project and how they have been shared. For example, if a project has resulted in funding for solar panels, then it can be documented where those panels were placed, perhaps a community hall, as well as how much energy they have generated to show how much money was saved for the community. Increased Capacity is evident when a project invests in locals and their institutions, which also increases social capacity and economic success (Brooks, Waylen, and Mulder, pg. 21266, 2012). Ways in which this can be tracked are by showing financial investments in a community because of a project as well as how many community members have been involved, in which ways, and by documenting the various skills that community members

have been trained in. Engagement in a project should honor positively supporting cultural traditions and governance institutions (Brooks, Waylen, and Mulder, pg. 21266, 2012). This can be measured by showing how a project has incorporated the feedback of Elders and youth as well as if the researchers conducted themselves in a way that respects local political institutions such as a Hamlet Council or HTO.

Building off these characteristics, I offer suggestions (Table 5) on measurable indicators that researchers or communities could put in place to gauge similar projects' success. This table is an unanticipated outcome of the research I conducted as many participants talked about specific actions researchers can take to generate community buy-in.

Table 5. Characteristics of success and measurable indicators for successful local adaptation programs	
Characteristics	**Potential Indicators**
Social Capital and Participation	● Track attendance and attendees at various project meetings and at different stages in the project? If attendance has lowered, ask former participants why they decided not to attend. ● Document the project employment positions and measure how many locals occupy those roles. ● Track how the project has grown since inception.
Equity	● Count how many community members are involved in the project during its various phases. ● Track the number of paid working hours that have been used and this can include age, families, and gender to better understand distribution. ● Hold regular focus groups, distribute surveys, and hold Town Hall meetings to ask specifically if community members feel the project is meeting their expectations.
Increase Capacity	● Track the number of residents who have been involved in training aspects of a project. ● Conduct pre and post-test and interviews to document if residents appear to have acquired skills.

	● Document if there has been an increase in research or other projects that can be linked to the start of another.
Engagement	● Track the number of HTO and Hamlet Council meetings that researchers have conducted about the project. ● Count how many community members attend the meetings. ● Monitor the number of hunters and trappers that use project data for example, sea ice thickness. Invite several community members to a focus group to determine how useful project data are and find out any changes that might be required to the project. ● Track how projects may contribute to traditional activities such as paying for fuel or ammunition for Hunters and Trappers or supplying Elders with refreshments at meetings.
Adapted from "How national context, project design, and local community characteristics influence success in community-based conservation projects" Brooks, Waylen, and Mulder (2012)	

DISCUSSION

In this case, it was clear that the Pond Inlet participants approved of SmartICE. Approval was demonstrated through their change in attitudes toward the project as evident in interview comments about how the project was positive and helped to address community needs. It was striking that local attitudes towards the project shifted in just over a year, which can be attributed to the SmartICE personnel taking appropriate and meaningful steps to engage the community throughout the process.

During their interviews, community members shared frustrations about the typical colonial approach that many researchers continue to practice year after year. Overall, the researchers that community members spoke about were graduate students, post-doctoral fellows, faculty members, government researchers, and consultants. Most complaints were towards researchers from the natural sciences. Participants talked about the desire to be included in research projects and be regularly updated on the progress and outcomes. Most participants talked about the value of research, particularly in understanding and adapting to the changes caused by climate change. However, because participants shared that they are tired of being researched and would instead like to help conduct research, the research/researchers approach needs to change. The lack of engagement from researchers can be due to the nature of the researcher's discipline, lack of sufficient funding to allow for an adequate level of community engagement, short timelines, as well as a general sense of being unsure of how to engage the community meaningfully (Nickels et al., 2007). Based on my observations and the number of interview participants that talked about SmartICE, their process demonstrated that it was possible to develop an adaptation project that fully engaged the community, met project goals, and

supported local knowledge systems such as IQ. Social scientists such as anthropologists can take part in supporting the development and deployment of such projects by employing the discipline's knowledge of building meaningful connections in the communities where they operate. I believe that to start such a project, a researcher must visit a community, get to know residents, and find out what the primary concerns for the community are and if there is an interest in developing a partnership. It is important for a researcher to spend a significant amount of time in a community where residents get to know the researcher and feel comfortable discussing their concerns and want to participate in the development of a project. It is necessary to point out that Indigenous scholar Linda Tuhiwa Smith cautions that when framing a research problem (a step-in Settler research to develop a project) researchers often focus on Indigenous people or their communities and do not consider that the issue likely stems from "social or structural issues" (Smith, p. 105, 2021). While I have never formally or informally been involved in SmartICE, I could discuss specific aspects of the project with my interview participants due to the relationships I had established. There is a clear need in several communities in the North of Canada and Subarctic region for climate change adaptation projects that natural sciences can co-design and co-develop with social science practitioners. Due to the potential constraints that natural scientists might have, such as the lack of familiarity with building interpersonal connections with communities, anthropologists would be a natural partner in building connections. Developing these projects appropriately with a community and coming together in a mutually agreed-upon fashion is advantageous and the ethically correct approach during this era of reconciliation. Actively listening to each other and finding common ground to support equity is necessary to the sustainability and success of any community-based project. Second, the respect, acknowledgment, and collaborative design of a climate change adaptation project ought

to clearly understand how to bridge different knowledge systems that reject a Settler scientific hierarchy. Last, working together to develop tools and deliverables locally situated and owned by the community is paramount for a successful climate change adaptation project.

Research Implications for Inuit Communities

Inuit communities are not homogenous in their views on the approach that researchers need to take when developing adaptation and mitigation projects. However, researchers should take the time to understand the local research needs and the desired approach by local organizations such as Hamlet offices and HTOs. National organizations such as ITK have called for a significant change in researchers' typical approaches by insisting that communities be adequately consulted before the start of a project, that residents be permitted to co-design and co-develop the project, and that skills training is incorporated in the approach (Inuit Tapiriit Kanatami, 2018). It is reasonable to assume that communities may develop local engagement rules by developing a locally controlled approval process, which could assist in ensuring that engagement by researchers is done in a way that respects local desires. It could also inhibit researchers' desire to conduct research in the community or region, which could be seen as more bureaucratic red tape. Some researchers might view this as inconvenient or cumbersome. However, I argue that there are many benefits to partnering with the community, such as empowering residents to take a vested interest in the project, and leading to skills development. It is reasonable to assume that there will likely be researchers that do not wish to take an interdisciplinary approach and that some community members do not mind that a research project does not take that approach. The results of my interviews suggest that some community

members were content without being fully invested in the research project. However, most participants talked about the desire to be more invested in a research project from the onset so that they can contribute their knowledge system and experience (adding multiple partial perspectives) to benefit themselves and the community from further research. Additionally, as seen with the response to SmartICE, such an approach can led to increased local research capacity and promote the project's sustainability. Undoubtedly, taking the steps that communities and organizations call for will require more time, funding, and patience, but an interdisciplinary approach that includes anthropology is much more likely to foster strong connections in the community.

CONCLUSION

This study has its limitations: for instance, only about one percent of Pond Inlet residents were interviewed, and their comments may only reflect their individual perspectives. While qualitative research is a powerful tool that can be used to help us understand various aspects of the human condition, it also presents limitations in not investigating causality. We should not rely upon one knowledge system; we should design projects from an interdisciplinary collaborative approach that strives towards finding ways to incorporate Indigenous perspectives; ultimately, the suggestions made by researchers need to be clearly explained to Indigenous community members. The community will need to decide what they would like to do with the knowledge and suggestions presented by researchers. While I noticed a pattern in how residents spoke about SmartICE during my trips to Pond Inlet and noticed the change in the tone with which people spoke about the project, this type of analysis is beyond the scope of my research. Nevertheless, altering researcher approaches to fit local needs and to respond to national organizations' calls for change should yield substantial results and greater local buy-in (Inuit Tapiriit Kanatami, 2016, 2018; Pedersen et al., 2020; Wong, Ballegooyen, Ignace, Johnson, & Swanson, 2020).

My research adds to the growing understanding of the need for changes in the typical approaches of researchers to the communities within which they conduct research. Second, my research illustrates specific approaches researchers can take to work in partnership with Inuit communities. Furthermore, my involvement with the Ikaarvik summit and observations about the approach of SmartICE researchers allow other researchers to identify best practices of engagement, knowledge mobilization, and dissemination for other Inuit communities. Moreover,

my dissertation, illustrates how social scientists can work not only to help address local needs as related to but not limited to climate change adaptation but also how anthropologists can help facilitate dialogue and partnership with communities and researchers. Finally, I hope other Inuit and Indigenous communities can perhaps see that there can be positive outcomes in working in partnership with researchers, especially considering the increasing threats brought on by climate change.

CHAPTER 3: COMMUNITY-BASED PARTICIPATORY RESEARCH: A MEANS TO DECOLONIZE RESEARCH

In this chapter, I present a range of community-led research approaches that address local and regional concerns, consider their alignment with Indigenous organizations' and communities' calls for changes in the research enterprise, and argue for specific approaches to research that moves away from continued actions that reproduce Settler paradigms. This includes practicing predatory research, limiting Indigenous community engagement and ownership of data, limited transparency, and the neglect of Indigenous epistemologies. While conducting my field research, I concluded that it is necessary to change Settler scientific approaches to facilitate the use of Indigenous Knowledge (IK) systems within the framework of Community Based Participatory Research (CBPR) and science broadly. Indigenous communities ought to have sovereignty and autonomy over research projects conducted in or surrounding their community. Now is the time when Indigenous epistemologies and research approaches must take the lead in the design and implementation of research projects.

Research in and around Indigenous communities has an extensive history of being colonial and prescriptive (Louis, 2007; TallBear, 2014). Settler research largely operates within a colonial framework, which is demonstrated in part by how funding is administered to southern institutions to conduct research in the North of Canada, how knowledge is rooted within Settler scientific evidence, and the nature of academic disciplines largely operate independently from other disciplines; going against the holistic nature of Indigenous epistemologies (Pfeifer, 2018; Silvertown et al., 2013). When considering the authoritarian nature of Settler research, especially in Inuit Nunangat (homeland) it has been shown time and time again that research has been

imposed on the Inuit people. For example, they have been treated as objects of study with very little participation. Southern institutions often do not engage Inuit in project design, analysis, or decision-making during a study. Furthermore, even though Inuit in Canada have often been the subject of Settler research, the research benefits tend to target Settler populations. (Inuit Tapiriit Kanatami, 2018; Pfeifer, 2018). Inuit scholar Pitseolak Pfeifer states "I argue for the need to have a shift in Arctic research governance away from ways of thinking and doing that reinforce colonial frameworks of producing knowledge and making policy, and towards research and policy accountability to Inuit communities" (Pfeifer, p. 34, 2018). It is in the spirit of accountability to my Inuit collaborators that I begin this chapter. In the first part of this chapter, I will discuss what Indigenous leaders, scholars and communities have asked of Settler researchers. I then discuss specific Calls to Action listed by the Truth and Reconciliation Commissions, and then I will detail the "National Inuit Strategy on Research" that was published by the Inuit Tapiriit Kanatami (ITK). In this paper, I provide an overview of some of the political movements by Indigenous communities and organization to change the colonial nature of research. I also present the various forms of different Settler research approaches that have been used to engage community members. I then describe a specific research project that was presented and then implemented in the community of Pond Inlet, Nunavut. The intention of this paper is to identify the specific steps and actions taken by Settler researchers to establish a research project that considers the concerns, needs and level of engagement that Inuit community members desire in a Settler research project.

Before I begin, I want to emphasize that control of research by Indigenous people and their communities has long been a central part of understanding the exercise of political

sovereignty. Since the 1970s, research reform and criticism has been at the heart of Indigenous nations' political actions - recognizing the role that research plays in policymaking. Settler governments typically form policies that are informed by research and political interests. However, research that has been conducted with Settler paradigms and Settler researchers can be problematic for Indigenous communities who have described fault in this approach. At times, Indigenous ways of knowing have suggested that the Settler narratives neglect critical elements that are necessary for the development of policies. Indigenous communities have called research into question for several decades, particularly in the 1970s through the Yukon Native Brotherhood Movement's publication *Together Today for our Children Tomorrow*. In this document, they state: "we need research to show us the best way to take advantage of the good parts of the Whiteman Way, while at the same time keeping the best parts of our Indian Way" (Brotherhood, Y.N. pg. 23, 1973). Specifically related to policy change, the Yukon Native Brotherhood stated a desire "....to find solutions for problems and suggest changes to existing government programs - and where necessary, design new ones" (Brotherhood, Y.N. pg. 23, 1973). In the United States, the American Indian Movement also echoed these desired changes to research. This is especially visible in Vine Deloria Jr's book *Custer Died for Your Sins*. Deloria, who was also the Executive Director of the National Congress of American Indians, cautioned that it is necessary for Settler research to change their approaches by prioritizing the wishes of Indigenous communities. He states that, unless research changes, "they (Indigenous communities) will seal up the reservations until no further knowledge, useless or otherwise, is created" (Deloria, p. 96, 1988).

Deloria had an active stake in the transformation of Settler research because he knew that it played an important role in policy making (Deloria, 1988). In the 1970s and 80s, there was a

recognition amongst Indigenous scholars that Settler research was always harmful; the only way it could provide benefits was if Indigenous priorities drove the research (Deloria, 1988). Research needed to be sanctioned by and inclusive of Indigenous communities; most importantly, it had to support Indigenous political sovereignty (Brotherhood, Y. N., 1973 & Deloria, V.,1988). Today, across the territories in Canada, the discussion of sovereignty is at the forefront of national and international political discourse. There has been progress with modern treaties between Indigenous communities and the Crown (Government of Canada) since the Supreme Court of Canada decision (Calder et al. v. Attorney-General of British Columbia) in 1973. However, there continues to be mounting concerns pertaining to self-governance and research happening within places and with people that are part of modern-day treaty agreements, particularly when it comes to concerns about research on wildlife and for the development of natural resources (White, 2002 & Government of Canada, 2020).

The Truth and Reconciliation Commission of Canada (TRC) was convened in 2008 to establish a new relationship of mutual recognition and respect between the Indigenous people of Canada and the Government of Canada (Canada, 2015). The TRC established 94 Calls to Action to start a renewed reconciliation process (Crown-Indigenous Relations and Northern Affairs Canada, 2019). The TRC states that "reconciliation is about establishing and maintaining a mutually respectful relationship between Aboriginal and non-Aboriginal peoples in this country" (Canada, 2015). The Honourable Jody Wilson-Raybould, a Kwakwa̲ka̲'wakw jurist, who served many public offices but is most known for being the former Minister of Justice and Attorney General of Canada has written about reconciliation in her book, *True Reconciliation. How to Be a Force for Change* (2022). Wilson-Raybould defines true reconciliation with three core

practices, which are: learn, understand, and act. For her, the act of learning involves a forward direction based on knowledge of the past and present that guides us with good intention and purpose (Wilson-Raybould, p.179, 2022). When she details understanding, she points out that we need to recognize the ways in which we interact with the world, and each other; recognize our differences, particularly our worldviews (Wilson-Raybould, p. 198, 2022).The colonial structures such as the Indian Act, economics, governance, culture, and the environment all need to be understood if we are to proceed toward true reconciliation (Wilson-Raybould, p. 185-189, 2022). Her final point in outlining true reconciliation is to act. She challenges us to act in our daily lives and spaces, but she does not outline specific actions. Most of her charge here is directed towards governments to act on old promises and move forward with self-government, but she does encourage us all to reflect and have conversations with our families and friends. She always acknowledges that the work toward true reconciliation is a marathon that may never end (Wilson-Raybould, p. 277, 2022). Similarly, we can see that it is likely that the transformation of research may never end but that it is moving in the direction of being more inclusive and responsive to the needs of Indigenous communities.

As we move along in this era of reconciliation with Indigenous people in Canada, there needs to be a fundamental shift toward being inclusive in approaches to research and being more inclusive in general, which requires clear guidelines for Settler researchers. Call to Action 65 from the TRC demands the establishment of a national research program with multi-year funding to advance reconciliation efforts (Truth and Reconciliation Commission, 2012), which still needs to be established. While the TRC Calls to Action do not directly address research, calls 62 to 65 in the section on Education for Reconciliation tangentially imply necessary change in research practice.

Call 62 states:

> "We call upon the federal, provincial, and territorial governments, in consultation and collaboration with Survivors, Aboriginal peoples, and educators, to: ii Provide the necessary funding to post-secondary institutions to educate teachers on how to integrate Indigenous Knowledge and teaching methods into classrooms."

Call 65 states:

> "We call upon the federal government, through the Social Sciences and Humanities Research Council, and in collaboration with Aboriginal peoples, post-secondary institutions and educators, and the National Centre for Truth and Reconciliation and its partner institutions, to establish a national research program with multi-year funding to advance understanding of reconciliation" (Truth and Reconciliation Commission, 2012)."

By acting on these calls, there would be a greater understanding in the education system around the topic of reconciliation. Academic disciplines may be able to determine ways to change Settler research approaches and support the ongoing demand that Indigenous communities want in being able to exercise their political sovereignty by controlling local and regional research activities.

Taking into consideration the TRC's Calls to Action and knowing that Indigenous communities have advocated for a change in the colonial relationship with research, there have been further detailed publications presented such as the "National Inuit Strategy on Research" (NISR) that outlines specific actions to facilitate such changes demanded by the TRC.

In 2018, the ITK published the NISR that explicitly states the need for Settler research to be more inclusive and respectful to Inuit people, their communities, and epistemologies. The NISR outlines 5 priorities to achieve its objectives of changing Settler research to be "efficacious, impact, and meaningful" (Inuit Tapiriit Kanatami, 2018). Those 5 priorities are

advance Inuit governance in research, enhance the ethical conduct of research, align funding with Inuit research priorities, ensure Inuit access, ownership, and control over data and information, and build capacity in Inuit Nunangat research (Inuit Tapiriit Kanatami, 2018). It can be argued that there is recognition of an epistemological crossroads where Settler research has largely ignored or discredited the validity and function of IK, including Inuit Qauijimajatuqangit (IQ) and Traditional Ecological Knowledge (TEK) (Fernandez-Gimenez et al., 2018; Kimmerer, 2013; Nadasdy, 2016). Challenges remain in the encounter of Settler science with IK, IQ, and TEK with Settler science. For many years, Indigenous organizations, leaders, and communities have called for an approach to research where the benefits are mutually shared; research is guided by IK, and ways of knowing, skills are transferred, and local or regional priorities are addressed (Castleden, Morgan, & Lamb, 2012; First Nations Information Governance Committee, 2007; Inuit Tapiriit Kanatami, 2018; Wilson, 2008). In my fieldwork in Pond Inlet and Cambridge Bay, Nunavut, it was clear that the priorities at a community level are to ensure that Settler researchers communicate early on about the type and way they will conduct research, that benefits are shared with the community, locals are hired, and that the findings of the research be presented back in a way that is easy to understand. The most significant difference between what the above authors have called for versus what I was told in the communities is that while IK and ways of knowing should be respected, there is a concern that IK may be used incorrectly. In responding to Calls to Action 62 and 65 of the TRC, I examine, in this chapter, the strengths and weaknesses of utilizing the various research methodologies (within the Settler tradition), including Citizen Science (CS), Community-Based Monitoring (CBM), Participatory Action Research (PAR), and Community Based Participatory Research (CBPR) in order to determine suitable approaches that facilitate Settler research that can be used to help local issues of concern

for Indigenous communities and in the development of policies. These strengths and weaknesses show potentially suitable methodological approaches that best fit specific communities. I see the Settler tradition as methodologies constructed from the Judeo-Christian foundation that led to the development of dominant science (Liboiron, 2021). I hope that by developing a greater understanding of these along with Indigenous methodologies, we will see a time when Indigenous methodologies are used over Settler research methodologies. I discuss how these research approaches have the potential to break down the epistemological barriers between the researcher(s) and IK holder(s). I chose to focus on these research approaches because they have been cited by both Settler and Indigenous scholars as some of the most useful and acceptable means to combine or create encounters between multiple knowledge systems (Smith, 2021; Liboiron, 2021; Kovach, 2021; Silvertown, 2009). Indigenous scholar Margaret Kovach states that Settler participatory methodologies are potentially the most useful and acceptable because they "valu[e] the relational," and relationality is fundamental to Indigenous research (Kovach, p.24, 2021).

Furthermore, Linda Tuhiwai Smith, discusses that community-based research(ers) have a unique opportunity to conduct research "... because they are placed within a community to document what is happening at a local level over long periods of time" (Smith, p. 281, 2021). Using a case study in this chapter, I further showcase the insights from Inuit participants about their experiences working with Settler researchers in the community of Pond Inlet, Nunavut. I examine and share these views to outline their suggested changes to the often prescriptive (little to no community engagement in the design and execution of the research) nature of research (that largely benefits the Settler researcher and not the research subjects), with the aim that Settler researchers will adopt a more inclusive process that brings community members and their

knowledge systems into the design, and execution of research projects. Research frameworks and procedures are produced by various Indigenous organizations with clear and concise recommendations for how, when, and why researchers should engage with Indigenous people, communities, and organizations in a mutually respectful and beneficial relationship where all parties can meet stated goals. My research guidelines for this case study have been influenced by incorporating suggested approaches set out in "Negotiating Research Relationships with Inuit Communities" (Inuit Tapiriit Kanatami, 2007) and the "National Inuit Research Strategy" (Inuit Tapiriit Kanatami, 2018). The reason for choosing these guidelines is that an Inuit-led organization produced them, and the research took place in Inuit Nunangat with the Inuit. I conclude with recommendations to change to a more inclusive approach to research that can facilitate a mutually beneficial relationship between researchers and community members.

In the next section, I will describe the typical ways in which Settler researchers have engaged citizens and communities in participatory research, followed by a potentially new way to define how we can categorize these various methodologies, which then leads to a discussion about Indigenous research and specific steps that research should take before, during, and after a visit to an Inuit community as described by the Ikaarvik group. It is crucial to understand how citizens have historically been included in research to better understand how and why that engagement has changed and what factors might have played into those changes, such as political activism. In the second part of the paper, I describe community-based monitoring efforts in Nunavut. The origins of this case study are followed by the results of interviews with participants from Pond Inlet, Nunavut. I conclude with a discussion about finding appropriate methodologies that promote reconciliation, promote Indigenous epistemology, and research, and aim for meaningful engagement with Inuit people and their communities.

Engaging citizens and communities in research

The following section outlines several ways non-Indigenous and privileged citizens were engaged in research starting in the 1800s. I want to illustrate that engagement in science was not a universal or equal opportunity for all. Many colonized communities, especially Inuit, were often exploited, their knowledge and artifacts stolen for research and were the subjects of experiments without their consent (Irniq, 2008). In this section, I also put together a similar historical timeline to contrast the experiences Inuit had with research in parts of Nunavut and the Northwest Territories.

Documented involvement of citizens' involvement in data collection for research reaches back several centuries, if not further. In North America, in the 1880s, lighthouse keepers on the east and west coasts kept count of bird strikes and documented the various species because of the alarming number of birds that would get confused by the light tower and strike the lighthouse. It was common to see lighthouses adorned with numerous taxidermy birds that had struck the lighthouse (Bonney et al., 2009). In 1874, amateur astronomers were recruited by the British Government for the Transit of Venus project to measure the Earth's distance to the Sun (Dickinson, Zuckerberg, & Bonter, 2010). In the U.S., large-scale ecologically focused citizen-science research began with the annual Christmas Bird Count in 1900, run by the National Audubon Society (Ducey, 2009). This project drew on the interests of 'birders' across North America and still runs today. Similarly, since 1932, the UK British Trust for Ornithology has engaged in comparable work with its annual "Christmas Bird Count," using citizens to count various species of birds, which produced a rich data set and has led to environmental policy developments (British Trust Ornithology,2021; Silvertown, 2009).

Even though citizen engagement in research originated in ecological studies rooted in conservation biology, it has evolved in many different directions over the decades. In the 1940s, there was a shift in this type of research, focusing on year-round (as opposed to short-term, often only summer months) data collection, analysis, and recommendations—for example, year-round sampling for water and air quality (Macaulay, 2017). In the 1970s, Paulo Freire, among many others, argued that individuals, not the government, should govern their own needs to improve their lives, which led organizations such as UNESCO and the World Bank to invest in citizen research across developing countries (Dickinson et al., 2010; Macaulay, 2017). Throughout the 1980s and 1990s, agencies such as the centres for Disease Control worked with community partners on evaluation research, including advisory boards with community members, health and education professionals, volunteers, and policymakers. At that time, primary healthcare researchers were also engaging citizens, particularly in Indigenous communities (Macaulay, 2017). Since 2000, there has been a steady increase in the promotion and utilization of citizen research addressing conservation biology, public health, education, disaster prevention, coastal and marine monitoring, natural resources, veterinary medicine, and climate change, to cite just a few examples (Bell, Briggs, Bachmayer, & Li, 2015; Devries, Pratihast, Verbesselt, Kooistra, & Herold, 2016; Fidel et al., 2014; Martina Björkman & Jakob Svensson, 2017). Today, research that involves citizens as active researchers is found in most regions across the globe, with a steady rise of projects across the pan-Arctic, predominantly focused on understanding the effects of climate change or monitoring change (Pearce et al., 2009; Zehr et al., 2016). The Arctic region is home to over four million people, with one-tenth identifying as Indigenous. The Arctic has been experiencing amplified warming as an effect of climate change compared to any other region on Earth (Arctic centre, 2020; IPCC, 2019; Zhang et al., 2019). With the rapid biological

and physical changes occurring across the pan-Arctic, its comparative remoteness, the high cost of doing research there, and in some areas, Indigenous self-governance, make it a logical region to engage local citizens in climate change adaptation research through appropriate citizen research methods that empower local people (Johnson, Alessa, Behe, et al., 2015; van Vuuren et al., 2011).

Engaging Inuit in research

In this section, I provide a historical overview of Inuit involvement in research, with a similar timeline to the section above. What becomes apparent is that these engagement efforts look starkly different from what was offered to non-Indigenous and privileged individuals. Inuit were not engaged in research the way we would hope; they were exploited for their knowledge to provide economic opportunities to whalers and fur trappers, used in biological experimentation, and have seen their knowledge used in ways that misrepresent themselves and their communities. Whalers and fur trappers provided items to the Inuit in exchange for their knowledge and help; the exchange was exploitative and not equitable (Wenzel, 2019). There were consequences to the Inuit way of life that impacted their cultural practices and caused severe health issues, such as outbreaks of tuberculosis (Johnson, 2017). It is understandable why many Inuit do not trust practices labeled as research, are skeptical of its intentions and why Inuit organizations are working tirelessly to change the colonial nature of research and usher in an era of change ITK, 2018 and Wilson, 2018).

Early encounters between Inuit and European fishing ships occurred between the sixteenth and early nineteenth centuries. Sadly, there are accounts of Inuit and their belongings

being kidnapped and brought back to Europe to be put on display (Irniq, 2008; Kral, Idlout, Minore, Dyck, & Kirmayer, 2011). In 1765, Moravian missionaries established permanent settlements in Labrador to administer health care and other welfare services to the Inuit and promote commercial fishing (Indian and Northern Affairs Canada, 2006). During the mid-19th century, around the 1840s, encounters with White-Euro Americans were becoming more consistent with the establishment of whaling operations in the North of Canada by American, English, and Scottish whalers (Indian and Northern Affairs Canada, 2006). The whaling industry peaked in the 1860s , then whalers augmented their incomes by hunting caribou, walrus, and seal, which caused a strain on country food supplies for the Inuit. Just as whalers left their outposts, fur traders moved along with the Hudson Bay Company to establish trading posts to encourage the Inuit to trap foxes. This period also ushered in the arrival of the Northwest Mounted Police, representing the Federal Government. During this time, contact between early colonizers and Inuit was to exchange their Inuit Knowledge (IK) and animals for goods such as rifles, tobacco, cloth, and food (Indian and Northern Affairs Canada, 2006). While these encounters were not directly understood as research, it is important to point out that these early colonizers depended on IK skills, i.e., research, that has been passed down from generation to generation to obtain animals for sale and use in foreign markets.

The first archeological expedition in the North of Canada was in 1922, led by Danish geologist Therkel Mathiassen, part of the Fifth Thule Expedition. This expedition used Inuit in the area to not only locate but also dig up and interpret artifacts that were found (Folger, 2004; Griebel, 2014). Due in large part to the encouragement of colonizers for Inuit to engage in whaling, trading, and hunting, there was a shift in family groups living in small nomadic settlements into larger family units, which brought on the rapid spread of tuberculosis. With this

breakout of tuberculosis amongst Inuit populations such as the Coppermine Inuit, they suffered a death rate of 22 per 100 people. The Government of Canada initiated relief programs to provide health services (Kovesi, 2019). The Government of Canada also implemented other economic relief efforts in the 1930s and 40s due to widespread starvation from the over-exploitation of the country's food that Settlers harvested from the region (Indian and Northern Affairs Canada, 2006). In 1947, Inuit were sent south to sanatoriums to receive health care to treat tuberculosis. Unfortunately, the average time away was two and a half years and, in many cases, when individuals died, it was not common practice to inform living family members of the persons passing. During this time Northern Health Services implemented the Eskimo Identification Number system, which was a wearable tag with a number printed on it to keep track of Inuit; this was also used by Royal Canadian Mounted Police and the HBC (Indian and Northern Affairs Canada, 2006; Kovesi, 2019). From 1948-1952, the Government of Canada, responsible for establishing residential schools, permitted nutritional and dental experiments on Indigenous children living in residential schools (Mosby, 2013; Morton Ninomiya & Pollock, 2017). Sadly, these types of experiments on Indigenous people were not uncommon. In the late 1960s, global International Biological Researchers descended upon more than 30 Inuit communities. They conducted experiments that involved taking a skin sample from one person and grafting it onto a family member to monitor the reaction. Participants were not asked for consent nor informed about the purpose of the experiment. Not until recently have community members spoken out about this unethical treatment that has left them with physical and emotional scars (Canadian Broadcast Channel, 2019).

In 1971, the Inuit Tapirisat of Canada (now Inuit Tapiriit Kanatami (ITK)) was formed to promote Inuit autonomy, self-government and negotiating land claim agreements. With the

advocacy from ITK and other Inuit organizations, some land claim agreements have been negotiated with the Crown (Government of Canada), which allows for Inuit to have greater control over their lands, economic development, and the ability to regulate research that is being conducted in or around their lands (Indian and Northern Affairs Canada, 2006). Recently there has been the establishment of guidelines such as the Canadian Institutes of Health Research's "considerations and templates for ethical research practices" (2007) that focuses on the importance of participation and collaboration between Settler researchers and Indigenous communities (Kral et al., 2011). However, there continue to be inequities regarding Inuit involvement in Settler research that organizations such as ITK continue to advocate against (Inuit Tapiriit Kanatami, 2018).

Inuit community engagement with Settler research was different and not a uniform experience (Griebel, 2013). It is not surprising that most early Settler research in Nunavut did not contain details concerning Inuit conceptions of nature, their knowledge system (IQ) or local stories (Griebel, 2013). It seems that historical Settler research and its lack of engagement with Inuit does not stem from poor or even hostile relationships, it is linked to overall disengagement with community members. This disengagement, arguably stems from challenges within Settler research to effectively communicate, involve, and demonstrate relevance to community members despite their strong interest and desire to be involved (Griebel, 2013). As I have discussed above, most Settler research engaging Inuit was either to extract their local knowledge for resource exploitation, build on archeological knowledge, or to conduct biological experiments. However, a different type of engagement was taking place in Pond Inlet, Nunavut between 1975 and 1989. The Arctic Research Establishment (ARE), which was a private research station operated by the Steltner family hired and trained several Inuit residents to take sea ice, oceanographic and

weather data on a regular basis (Wilson, 2022). During my ethnographic research I had conversations with several community members who had worked for the ARE. The overall comments made by community members was that they enjoyed the work but did not understand what the overall objective was or how the work improved the community. I asked if IQ was used in collecting or analyzing data but was told no that the data collected was measuring sea ice, taking temperature and wind readings, and analyzing water samples. The community members that spoke about ARE had said that they are frustrated that they do not know where those data went or what they might have been used for. In her dissertation "The Sikumiut model: a cross-cultural decolonizing research approach for sea ice travel safety in Mittimatalik, Nunavut" Dr. Katherine Wilson discusses where those data ended up (2022). Wilson was able to find a living family member of the Stelner family who had boxes of the physical records housed in their basement. They agreed to donate those data to the community of Pond Inlet, but the community lacks the capacity to archive and store them at this time (Wilson, 2022). Those data are currently stored in the Government of Nunavut territorial archives in Ottawa (Wilson, 2022).

What Settler scholars, including myself, suggest is that now is the time to rethink and redesign settle research with equitable and equal involvement of IQ and Inuit community members that reflect Inuit research, methodologies and address community and regional concerns (Rowley, 2002).

In the next section, I will discuss citizen science, community-based monitoring, participatory action research, and community-based participatory research to provide historical context and illustrate their strengths and weaknesses. These can then be used to determine which one, if any, of these approaches would be appropriate for use in specific Indigenous communities. I will conclude the section with the definition of citizen engaged research. I have

chosen these various methods in this section because they are frequently cited and discussed by Indigenous and non-Indigenous scholars when probing research with communities.

Citizen Science

In its most basic sense, Citizen science (CS) is the process where non-expert volunteers (citizen scientists) are involved in a research project as data collectors and data providers – this is most often quantitative data. What I mean by quantitative data is best understood by thinking about the role of citizens in the Christmas bird count, which is to count and document various types of birds they see (Conrad & Hilchey, 2011; Silvertown, 2009). The history of CS is deeply rooted in ornithology and astronomy, from counting birds to observing stars (Dickinson et al., 2010), as I've discussed in the previous section. CS's strengths are the volume and quality of data collected, its popularity among the general population, and generally low cost (Conrad & Hilchey, 2011; Dickinson et al., 2010; Silvertown, 2009). There has been a marked increase in the use of CS in areas such as policy and education. During the Obama administration, in the United States, federal agencies were asked to appoint a coordinator for CS to support agency mandates and encourage citizen engagement (Baker, 2016). However, one of the ethical concerns about the increase in the use of CS is the large amount of free (unpaid) labour using volunteers that academic institutions and governments rely on (Kimura & Kinchy, 2019). In 2015 globally, CS has been attributed to the growth of macroecology research, geographic ecology, the study of invasive and disappearing species, and urban ecology (Dickinson et al., 2010). There is still skepticism of CS from the Settler scientific community about the quality and validity of the data collected by citizens and concern that CS projects have low rates of peer-

reviewed publications (Burgess et al., 2017; Cox, Philippoff, Baumgartner, & Smith, 2012; Kimura & Kinchy, 2019). As the growth of CS is ever-expanding it is important to stress that it should not wholly replace funding for environmental science. Marcia McNutt, the editor in chief of science, states, “without adequate federal support, gaps, of all kinds can develop in the balance of exploratory, basic, applied, and translational research; in the support of different types of institutions” (McNutt, 2014); which cannot entirely be supplemented or replaced with CS.

The hallmark of CS is its transformative nature, it gives voice to marginalized communities that historically have been left out of research and advocacy, can increase, and promote participation in political movements, and can decrease inequality (Kimura & Kinchy, 2019). Kimura and Kinchy argue that CS can be used to challenge denials of environmental health problems as seen with the Louisiana Bucket Brigade that came together in the wake of the Deepwater Horizon oil spill in 2010 to crowdsource a map to illustrate the size and scope of the damage (Kimura & Kinchy, p. 16, 2019). Over the years, CS programs funded by governments and NGOs have led to the emergence of Community-Based Monitoring, which aims to be more holistic in its engagement and empower citizens to lead and direct research projects (Conrad & Hilchey, 2011).

Community-Based Monitoring

Community-Based Monitoring (CBM) is defined as "a process where concerned citizens, government agencies, industry, academia, community groups, and local institutions collaborate to monitor, track and respond to common community [environmental] concerns" (Whitelaw et al., 410, 2003). CBM is often like CS in design, implementation, data collection, and reporting.

The major difference is that CS projects are frequently designed outside a community or region by a Settler researcher or research organization, and citizens typically volunteer to collect and input data.

In contrast, depending on the design of CBM projects, citizens may be more engaged in the design by choosing the research questions, data collection methods, analysis, and decision-making (Pollock et al., 2013). The weaknesses of CBM are like CS, concerns about data fragmentation, inaccuracy, and absence of objectivity (Whitelaw et al., 2003). Data quality issues have been raised consistently amongst scientists and policymakers when evaluating CS and CBM projects. Their concerns have led to a lack of treating those data as fact and simply anecdotal and therefore, not taking the issues and recommendations raised by concerned citizens seriously, which can feed into the broader question of the validity of quantitative versus qualitative research.

It is important to point out that the Settler scientific paradigm dominates CBM and CS, which helps us understand why these critiques exist and seem to continue to be unreconciled. Nevertheless, there is growing recognition that CBM is a strong alternative to traditional research designs, especially as regions and communities (often Indigenous) are affected by climate change and demanding the ability to influence policy at the decision table. The strength of CBM is that it helps empower communities and continues demonstrating its rigor and accuracy within the scientific community (Macaulay, 2017). CBM can create meaningful relationships, powerful research outcomes and evenly distribute the power imbalances between Settler scientists and Indigenous people and their communities (Wilson, Mutter, Inkster, & Satterfield, 2018). However, with proper training and spot checks by professional scientists, the quality of data collected by citizens is comparable to that collected by professionals (Danielsen et al., 2014;

Herman-Mercer et al., 2018; Shelton, 2013). Some examples of CBM include Narwhal management (Keenan, 2015), natural resource monitoring (Danielsen et al., 2009), and water quality monitoring (Shelton, 2013). There is no specific guide to how one must construct a CBM program. As Cohen et al., points out, CBM in Indigenous communities is problematic with the struggle between the tension of increased CBM demand and the overarching colonial structures in which they are sanctioned by (2012). It is obvious that CBM programs provide a platform that incorporates more IK in the steps of conducting a research project than, say CS. For example, Johnson et al. state that IK can be used as a conceptual framework, contributing, and analyzing observations, and helping identify monitoring priorities as well as the best sites for monitoring stations (Johnson, et al., 2016). It is worthy to note the concern that CBM in its current and often practiced form still prioritizes Settler knowledge as opposed to IK. However, we will see that Participatory Action Research and, by extension, Community Participatory Action provide greater flexibility in the placement and utilization of knowledge systems.

Participatory Action Research

The emphasis on participation and action in addressing local concerns sets Participatory Action Research (PAR) apart from CS and CBM. PAR is defined as, "community-directed process of collecting and analyzing information on an issue or situation to take action and make a change*"* (Bennett, 2004). PAR occurs when community members and researchers investigate local problems and provide solutions to the community to take collective action towards social change (Bennett, 2004). There are some similarities between CBM and PAR in that the approach is about working together; all parties are equally involved in the research project from

conception to finalization. Both PAR and CBM reject the colonial research paradigms that emphasize neutrality and objectivity; hence, a need to find an alternative to Settler research methods would replace the dominant research paradigms (Bennett, 2004). Bennett illustrates that the use of a PAR and CBM design often stems from the need to address a local issue or concern (Bennett, 2004). The idea that local citizens engaged in the research could act neutral or objective does not appear to be possible (Bennett, 2004). According to Datta et al. (2015), PAR can be respectful to IK as Settler science often ignores Indigenous spiritual relationships and traditional experiences as sources of research knowledge. By engaging PAR, research aims expand to include: 1) developing critical consciousness of both researcher and participants, 2) improving the lives of those involved in the research process, and 3) transforming the fundamental societal structures and relationships (Bennett, 2004). One of PAR's strengths is that it has been identified as a research method conducive to working with Indigenous communities, as long as researchers have empathy for their participants and aim to be accountable to Indigenous communities in their research (Datta et al., 2015). Some examples of PAR include wildlife health monitoring (Fidel et al., 2014), marine mammal management (Dale & Armitage, 2011), and community health (Wallerstein & Duran, 2010). As the definition suggested, PAR allows community members to assist the researcher by providing them with insight into participants' needs, values, and customs, and at the same time empowering them in investigating their social reality while building on local skills and increasing capacity for their community's autonomy (Bennett, 2004; Datta et al., 2015). A critique of PAR from an IK perspective is that the qualitative nature of PAR is still rooted in Settler thought and language. Therefore, it can be challenging to think outside of the perspective of historical qualitative approaches that were extractive in nature (Kovach, 2009). This viewpoint was often looking at Indigenous

communities and peoples from a position of being in crisis and with limited research capacity (Kovach, 2009). This may be why there was a lack of inclusion of Indigenous people in Settler research and that they rarely-if ever- benefitted Indigenous people (Kovach, 2009). One of PAR's weaknesses is that to be successful, the problem must be identified and defined, analyzed, and solved by the community (Bennett, 2004). Due to a lack of capacity, it may be difficult for Indigenous or other communities to identify the problem or source of a problem. According to Tuck (2008), one of the best utilizations of PAR in a project is from the very beginning and throughout, as it encourages learning and new ideas (Tuck, p.49, 2008). I argue that a greater focus should be given to the strengths of CBM and PAR. Greater attention also needs to be paid to how both can work collegially within Indigenous methodologies. There should be greater attention also given to both PAR and Community Based Participatory Research (CBPR) approaches as both can work collegially and in partnership with Indigenous communities. Taking from Coombes and Tallbear, there needs to be a shift in thinking away from the concept of equality in research (being shared equally) to an emphasis on Indigenous leadership in the process (2012 and 2014). There is a considerable amount of work that needs to be done to decolonize and reduce (or eliminate) the prescriptive elements of both PAR and CBPR. For example, the concern that Indigenous communities have about intellectual property, the need for more appropriate ethics procedures, and research funding needs to be addressed for both PAR and CBPR (Coombes, Johnson, & Howitt, 2014). There is also a need for greater flexibility around the community goals of a PAR or CBPR project that allow for adaptability and creativity (TallBear, 2014).

Community-Based Participatory Research

Community-Based Participatory Research (CBPR) was first developed in the 1940s by Kurt Lewin, a social psychologist. CBPR uses research for social action and change and rejects researchers' positivist belief in disregarding participants' meanings, as the participants act from an objective perspective (Wallerstein & Duran, 2010). CBPR is understood as an "epistemological orientation" that aims to create social change through knowledge-generation and building community capacity to address issues of local concern (Jacobson & Rugeley, 2007; Stanton, 2014; Stringer, 2007). CBPR is not a research method but a broader research strategy (methodology) to understand the best process by which community members can address concerns or issues to act on a particular issue that the community or region is facing (Castleden et al., 2012; Stanton, 2014). CBPR provides a framework that allows the incorporation of IK and Settler science to facilitate a productive working relationship, especially between the Indigenous and scientific communities (Fletcher, 2003). In other words, CBPR allows the community and researchers the ability of seeing the world differently by incorporating multiple perspectives and by acknowledging that research is not value-free (Fletcher, 2003; Koster, Baccar, & Lemelin, 2012).

Community encompasses multiple dimensions, such as geographical, racial, common values, interests, gender, religious alignment, sexual orientation, and so forth (Springer & Skolarus, 2019). Methodologically, CBPR operates on the understanding that each stakeholder involved in a research project has equal status, which is particularly important for Indigenous communities who can have multiple epistemological standpoints (Castleden et al., 2012; Jacobson & Rugeley, 2007; Stanton, 2014). Stringer (2007) describes the social values of CBPR

as democratic, equitable, liberating, and life-enhancing (2007). Historically, CBPR used methods grounded in the social sciences and other disciplines to find practical solutions to social problems. In the 1960s, CBPR declined because of its association with radical political activism; however, CBPR has since re-emerged due to its practical, theoretical focus and resurgence of political activism (Stringer, 2007).

The challenge with developing a project within a CBPR framework is that the process itself can be much slower than traditional methods as it takes time to build trust, seek interest, and train community members. Larger-scale projects involving many community members can be difficult to manage, and ethical concerns are often raised, such as the risk of confidentiality breaches. Due to its qualitative nature, CBPR has been challenged (like CS and CBM) as not being academically rigorous compared to other traditional, mostly quantitative approaches (Macaulay, 2017; Stanton, 2014). Despite these concerns, CBPR is often hailed as a "novel approach to research outside the academy" as it is not constrained by colonial academic practices and power structures (Castleden et al., 2012; Drawson, Toombs, & Mushquash, 2017). This is critical in this era of reconciliation with Indigenous people and their communities. CBPR is aligned with Indigenous organizations' calls to action, communities, and leaders to create more inclusive and Indigenous-led research (Fidel et al., 2014; Jacobson & Rugeley, 2007)

Across all four of these approaches, there are concerns around the colonial nature of research that historically has diminished Indigenous methodologies (Margaret Kovach, 2009). One of the primary concerns from Indigenous scholars such as Margaret Kovach is that IK has been and is often misrepresented, appropriated, manipulated, or dismissed within academic institutions (Kovach, pg.37, 2009). However, she argues that writing, applying, and promoting Indigenous methodologies is paramount and critical for Indigenous cultural sustainability, not to

mention as well as a challenge to the colonial nature of the academy (Margaret Kovach, pg. 2009). In the following section, I describe a new approach that I am advocating for when it comes to research with and in Indigenous communities. I offer a new definition that aims to encompass different Settler science approaches and IK and worldviews.

Community-Engaged Research

As there are various forms of citizen and community engagement approaches within the Settler scientific tradition (community-based research, community-based monitoring, etc.), it is important to understand these variations. Equally important is to consider each of these approaches because they differ in scope, breadth, and application. Research is generally understood as investigating a subject or object with scientific methods to reveal or confirm facts (Moon, K., & Blackman, D, 2014). Monitoring can be thought of as careful surveillance of a particular object or area to track changes and develop adaptation strategies if necessary; a monitoring project may come out of a research project's recommendations (Vanclay, F., Esteves, A. M., Aucamp, I., & Franks, D. M., 2015). Observation can be like monitoring as it surveys a particular area, perhaps with a larger lens and much broader (Nikolaev, D., Chetiy, V., Dudkin, V., & Davydov, V., 2020). The findings from an observing project (system) can create a monitoring project that sets narrower parameters, which could be a more focused research project. Another difference is the length of time it can take to complete research projects using different applications (Burke et al., 2019; Foelsche et al., 2008). As projects that involve citizens grow in the Arctic and Subarctic regions, it is necessary to either establish clear definitions and parameters for the local engagement in research. This must be understood by both researchers

and community members or to develop a more inclusive definition of engagement that is less specific. Consequently, I offer a definition when thinking about the variations of the different research approaches that use community members in some capacity. The standpoint, I offer is community engaged research (CER). CER does not differentiate between research, monitoring, observing, or science; it allows the community and researcher to establish those parameters. I define community engaged research as the action of identifying an object of study that is of local interest of community members that would best be further understood by applying local (Indigenous) Knowledge systems and Settler scientific methods to determine its significance. Local knowledge is understood as the experiential lived experience and understanding of various ecological and social patterns situated within a geographical region or culture (Bélisle, Asselin, Leblanc, & Gauthier, 2018; Cruikshank, 2005). I offer this definition of IK, it is deeply rooted in the cultural practices and beliefs of Indigenous people that is holistic in nature, promotes social justice, and provides an understanding of ecological patterns and responses. Table 6 is how I see community engaged projects as a jumping-off point for various citizen and community research approaches.

Table 6. Various Community Engaged Research

Community Engaged Research Identifying an object of study that is of local interest would best be further understood by applying local knowledge systems and scientific methods to determine its significance.			
Research Approaches			
Citizen Science the process where volunteers (citizen scientists) are involved in a research project as data collectors and data providers (often quantitative data (Conrad & Hilchey, 2011; Silvertown, 2009).	Community-Based Monitoring is "a process where concerned citizens, government agencies, industry, academia, community groups, and local institutions collaborate to monitor, track and respond to issues of common community concern" (Whitelaw et al., 2003).	Participatory Action Research "Is a community-directed process of collecting and analyzing information on an issue or situation to take action and make change*"* (Bennett, 2004).	Community-Based Participatory Research is understood as an "epistemological orientation" that aims to create social change through knowledge-generation and build community capacity to address issues of local concern (Jacobson & Rugeley, 2007; Stanton, 2014; Stringer, 2007).
Examples			
Citizen Science: Audubon Society's Christmas Bird Count: https://www.nationalgeographic.org/idea/citizen-science-projects/	Community-Based Monitoring: Northwest Territories Water Quality Monitoring Program	Participatory Action Research: Photovoice and empowerment	Community-Based Participatory Research: Understanding community-based participatory research through a social movement framework.

Bringing all these types of understanding together can be challenging and often such an effort is not perfectly executed. However, there are several examples where Settler science and IK have come together within frameworks such as CBPR to address issues of local concern that have been led by the community and are vital to community well-being and pathways to reconciliation with Indigenous people (Bell et al., 2015; "SmartICE," 2017; Spiers, 2014). The conceptual diagram aims to simplify the understanding of each method and how they can fit

within the spectrum of engagement of community-engaged research. Margaret Kovach acknowledges that PAR is a research approach that aligns with Indigenous methodologies as it places values on relational, which is like Indigenous research (Kovach, 2021). Similarly, Linda Tuhiwai Smith believes that PAR is a way to bring voice to marginalized communities in an authentic and honest fashion (Smith, 2021). Kathleen Absolon recognizes that community-based strategies such as CBM and CBPR are being utilized more often by Indigenous researchers as they often align with community goals like employment and community ownership (Absolon, 2011). However, it is important to understand that some Indigenous scholars and Settler researchers are critical of participatory and community research.

Unangax̂ scholar Eve Tuck and Settler scholar K. Wayne Yang discuss Indigenous approaches counter to Settler science in their article "Decolonization is not a metaphor." The authors put emphasis on the need of Settler researchers to think about decolonization, obligations, relationality to "decentre Settler perspectives" (Tuck & Yang, pg. 1, 2012). The authors offer what decolonization needs: "...decolonization specifically requires the repatriation of Indigenous land and life" (Tuck & Yang, pg. 21, 2012), while they most cleverly state what decolonization is not. "It is not converting Indigenous politics to a Western doctrine of liberation; it is not a philanthropic process of 'helping' the at-risk and alleviating differing; it is not a generic term for struggle against the oppressive conditions and outcomes" (Tuck & Yang, pg.21, 2012). They state "Settler colonialism operates through internal/external colonial modes simultaneously because there is no spatial separation between metropole and colony (Tuck & Yang, pg. 5, 2012). Further to this, there needs to be a recognition that colonialism while well defined by many scholars should be understood by its specificities such as, investigating the

colonial apparatus that influences the relationships between the land, people, and environment (Tuck & Yang, 2012).

Continuing to execute any type of research using colonial methods and approaches cannot lead to decolonial outcomes (Liboiron, 2021). In addition, if a research project claims to be participatory and gains community or regional approval but in fact does not act in a manner that aligns with community expectations, then there can be further mistrust and frustration of Settler researchers (Kimura & Kinchy, 2020). Indigenous scholars who have discussed Settler researcher approaches regarding community engagement and Indigenous research stress the importance of relationships (Kovach, 2021; Smith, 2021). The best approach to developing a climate change adaptation program in an Indigenous community is by discussing the benefits and limitations of each research approach to determine how the community would like to be involved and what the desired outcomes are.

Indigenous Research

When considering the numerous definitions of research within the Settler scientific tradition, one would likely see keywords like *fact-finding, experimentation, objectivity, and truth-seeking* (Mazzocchi, 2009). Seeking a definition of Indigenous research is not straightforward or clear. Indigenous scholars have echoed this point and stated that there is significant work to articulate what Indigenous research is or is not. They argue that seeking a definition of Indigenous research is not the most paramount task; rather, gaining a better understanding and respect for Indigenous worldviews is the most vital task (Behe, Daniel, & Raymond-Yakoubian, 2019; Hart, 2010; Steinhauer, 2002).

When discussing Indigenous research, Settler researchers often compare and contrast it to Settler scientific research (Kovach, 2021). Indigenous scholars warn against this line of thinking because there are fundamental differences between the paradigms (concepts and theories) of Settler science and IK systems that cannot be compared (Wilson, 2008). Cameron also cautions against this comparison within the framework of knowledge production as it reinforces colonial power structures because Settler scientific knowledge is often described as being able to flush out truths and facts whereas IK is seen as anecdotal (Cameron, pg. 30, 2016). Settler science often treats IK as information that needs to be dissected to improve it rather than simply understanding or accepting it (2016). Both Steinhauer (2002) and Wilson (2008) argue that one of the key differences between Settler science and IK systems is that Settler science emphasizes the individuality of knowledge as proven, gained, and therefore owned. In contrast, IK stresses relationships and the sharing of subjective knowledge. To further understand IK, Wilson (2008) stresses the importance of understanding Indigenous research paradigms.

Gaining a better understanding of these paradigms requires the careful consideration of ontology (the nature of existence), epistemology (the nature of knowledge), methodology (framework of research), and axiology (values and ethics) (2008). Within ontological perspectives in Indigenous research, many scholars have pointed out a glaring difference from the Settler perspectives; the recognition and respect between the spiritual and physical realms and how dreams shape reality for Indigenous people (Cajete, 2000; Hallowell & Hallowell, 1960).

The nature of knowledge (epistemology) within Indigenous culture is passed down from generation to generation through storytelling that emphasizes humans' interconnectedness, animals, and the natural and spiritual environments (Kovach, 2005). Settler knowledge is based

on the idea of being objective, which is to suggest that the facts or truth produced are not impacted by politics, power structures or any other factors other than truth. This is different from Indigenous epistemology that promotes experiential understanding by utilizing the lessons and knowledge from Elders (Ermine, 1995). Wilson (2008) argues that Indigenous research is synonymous with relational accountability, which is holding oneself responsible to community members and the community, and that knowledge production is accountable in a cosmological perspective. Often, Settler science practices accountability but on much smaller scales from person to person, not people and the environment (2008).

Axiological considerations in Indigenous research are complex as there are many values, morals, and principles to be aware of. Hart (2010) recognizes this complexity and outlines eleven aspects that should be considered within Indigenous research paradigms. These aspects are: 1) Indigenous people need to have control over research, 2) Researchers need to demonstrate respect for individuals and communities, 3) Reciprocity and responsibility need to be practiced by researchers, 4) Participants in research need to be respected and kept safe, 5) Observation needs to be done without intruding on the lives of community members, 6) Listening and hearing should include researchers listening to themselves, 7) It is important to practice non-judgment by researchers, 8) When information is shared with researchers it is important to honor that, 9) Awareness of the connection between logic and the feelings the researcher is experiencing is vital, 10) Be self-aware when listening and observing, and 11) Acknowledge researchers' subjectivity (Hart, p. 10, 2010). The eleven objectives that Hart discusses closely align with what ITK stresses in NISR that calls for: 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 for Inuit Nunangat

research (ITK, p. 6, 2018). As Indigenous research continues to be practiced more, it is important to recognise that these approaches include various knowledge systems such as IK in general, Inuit Qauijimajatuqangit, and Traditional Ecological Knowledge. Another definition of IK is that it is the systematic observations of wildlife, weather, culture, and the environment; collected, practiced, and shared for thousands of years and deeply entrenched within Indigenous belief systems (Johnson, Alessa, Gearheard, et al., 2015). The Inuit within the Arctic and Subarctic regions have articulated their knowledge system as Inuit Qauijimajatuqangit (IQ). IQ is like IK as it is built upon traditional practices with a rich history and is understood as a way of life. IQ goes beyond a knowledge system; it is also how people interact and behave with one another and the environment (Pedersen et al., 2020). Traditional Ecological Knowledge (TEK) can be understood as knowledge gained through extensive observation and lived experience of a particular area or species (Mauro & Hardison, 2017). While TEK is practiced and passed down amongst IK holders, it can also be transmitted to and by other users of a particular resource. TEK is often used to predict environmental events and improve resource management (Huntington, 2000). There are many epistemological orientations to understand when interacting with a community, especially when designing a research project. One of the challenges to being aware of different epistemologies is how to apply IK and principles equally and correctly. One of the challenges in being aware of different Settler researchers face due to the historic nature of science, excluding different epistemologies, is how to apply Indigenous methodologies within their research (Kimura & Kinchy, 2019). Many may feel that they lack sufficient training, do not identify as Indigenous or are simply unsure as to how they can apply Indigenous methodologies in their research (Margaret Kovach, 2009). In the section below, I offer ways in which the Ikaarvik group would like to see Settler researchers apply IQ into their research approaches.

The Ikaarvik group, co-lead by Shelly Elverum and Eric Solomon, has worked to bridge Inuit Qauijimajatuqangit (IQ) and Settler science principles and practices and to partner researchers with community members, with the caveats that research needs to be relevant, and that skills and knowledge are passed on to community members through an experiential research design (Oceanwise, 2020). In 2018, Ikaarvik organized a summit (ScIQ) with Inuit youth and researchers in Cambridge Bay, Nunavut, to produce a guide that provides a series of steps that researchers can take before, during, and after a research trip that incorporates principles of IQ (Table 7) (Pedersen et al., 2020).

Table 7. Steps that researchers should take before, during, and after a research project. Adapted from "ScIQ: An invitation and recommendations to combine science and Inuit Qauijimajatuqangit for meaningful engagement of Inuit communities in research."*

Before arriving at a community
● Get community buy-in and feedback from the beginning— Contact the Hamlet, Hunters and Trappers Organization, Heritage Societies, or others in the community to ensure your research will be welcomed and relevant. ● When writing funding proposals, ask for additional funds to visit and work with the community to develop your research questions and methods. ● Talk to as many organizations as you can in the community about meaningful ways to get the right local people involved in your work and how best to inform and engage the community as a whole in your research. ● Take the time to research where you are going—history, customs, culture, and language. ● Remember that English may be a second language for many community members and plan accordingly for interpretation and translation services. ● Have all your documents translated into the correct dialect of Inuktitut for the community or communities you intend to work with. ● If you need a letter of support, ask for it well in advance. ● Be flexible when planning your research. Learn when good times to visit the community are and when is best not to come. For example, there are times when many people will be out of the community and on the land.

- If your work involves interviews or mapping, find out what work has already been done in the community to avoid repeating questions already asked of community members.
- If you are planning a field camp, please consider bringing your own food. Buying your groceries in town may appear to benefit the community, but groceries are limited in town, and you could leave the community without the foods they need.

During a community visit

- Be a human first and a researcher second. Introduce yourself as a person, not as a set of credentials.
- First, make yourself known to the community--As soon as you arrive, visit, and introduce yourself to the Hamlet, Hunters and Trappers Organization, local radio. Go on the local Facebook page to let people know you are in town and participate in any community gatherings. Look for opportunities to be active in the community.
- Next, make your project known to the community—have a table at the Coop or Northern and talk to people, do a presentation at the Community Hall, go on local radio and Facebook to introduce what you are working on. This is a great opportunity to include community members that you are working with.
- Remember that English is a second language in many communities. Do not use jargon.
- Do not assume that people will understand why you are doing what you are doing or care. Be prepared to explain why it matters and have a conversation with people to learn how your research is relevant to the community.

- Know that not everyone can speak on behalf of the community. Different people have different experiences and expertise. Take the time to find out who the right people to talk to are for the questions you wish to ask.
- Do not just ask the community to help you; ask how you can help the community.
- Plan to give back to the community—volunteer, do a public presentation, host a feast, etc.
- Become a teacher and a student—pass on your knowledge and learn from the community at the same time.
- Look for opportunities to work with the local schools or college - you can help inspire the next generation of Inuit researchers by sharing your knowledge and skills.
- Be prepared to bring cash for payment of stipends and honoraria.
- Be flexible when plans change. Accept and adapt to changes due to weather, community events (festivals, funerals, etc.), or equipment failures.
- Understand that there are many different dialects of Inuktitut and know which dialect people use before hiring an interpreter or having documents translated.
- Allow your Inuit guide to be in charge. When on the land, they call the shots. Trust that they have your best interests and safety in mind.
- We understand that you have timelines, deadlines, and budgets, but it is important to be flexible enough to work with the community's flow. Otherwise, your project may not fit with the community's pulse, and people who are busy taking care of family, jobs, and their own needs.
- Involve the community in interpretation of results and to help determine the relevance of the results for the community.

- Be thankful for your guides, assistants, and local co-researchers, and let them know how much you respect and appreciate them.
- Communicate to the community about the research throughout, not just at the beginning and end. Stay in touch via Facebook etc., to keep the community in the loop while continuing your work.
- Follow local, regional, and federal rules and regulations regarding archaeological and cultural resources. Do not pick up or take artifacts from the land.

After a research trip

- Pass on skills and knowledge so the community can continue the research after you have left.
- Credit and acknowledge the Inuit who worked with you and also their community, not only in citations but also in the body of your work and presentations.
- Celebrate with the community by hosting a feast, presentation in the Community Hall or other activities.
- Make sure anything that is left behind is translated into the appropriate Inuktitut dialect.
- Help other researchers to understand the community and how to engage them in a meaningful way.
- Share the beauty and history of the Arctic with the South. You are now a critical link between the North and South, and your experiences can help the rest of the country develop a better understanding and appreciation of this amazing place!

*Ikkarvik ScIQ recommendations By Pedersen, C., Otokiak, M., Koonoo, I., et al. 2020

The above table represents many Ikaarvik youths' voices who have worked tirelessly to clearly articulate the behaviors and actions they want to see researchers demonstrate as they work in partnership and help in the successful use of IQ. There are challenges for researchers and communities to fully implement the suggestions put forth, but through collaboration and knowledge sharing, this is a potential way to address local, regional, and global concerns that not only respects but relies on IQ.

Community-Engaged Research in the North of Canada

This research in this chapter was developed as an outcome of an analysis of CBM projects presented in 2014 at the annual ArcticNet Networks of centres of Excellence (henceforth=ArcticNet) conference in Ottawa, Canada. ArcticNet is Canada's largest single commitment to climate change science (Natcher, Maria Bogdan, Lieverse, & Spiers, 2020). During the talk table 8 was presented, which was an analysis of data availability and accessibility from the Atlas of Community-Based Monitoring and Indigenous Knowledge in a Changing Arctic (https://www.arcticcbm.org/index.html) (Figure 7). The Atlas displays a map showing where in the Arctic and Subarctic various CBM projects have been completed, are in progress or are on hold. This is a voluntary depository, and therefore it is unlikely that all CBM projects are uploaded here, and it is even more likely that community run CBM projects are less likely to be included here as opposed to ones that are operated by Settler researchers. Using Atlas data, the authors analyzed the total number of projects listed (N=79). Sixty-four were in progress, 11 completed, and four were put on hold for various reasons, such as lack of funding. The analysis was conducted to understand if the listed CBM projects were providing usable and

understandable data to communities and data users. It was determined only 17.7% of the projects provided accessible and usable data to end users (Murray et al., 2014).

Table 8. Analysis of Atlas of Community-Based Monitoring and Indigenous Knowledge in a Changing Arctic. Presented at the 2014 ArcticNet Conference, Ottawa, ON.

	In Progress	**Complete**	**On Hold**
N=79	64 (81%)	11 (14%)	4 (5%)
Project had a website for public access	49 (62%)	7 (9%)	
Data available on website	17 (22%)	2 (3%)	
Accessible Data *	13 (17%)	1 (1%)	

Accessible data = downloadable, in a format conducive to use (not PDF files). Reasons for lack of accessibility also include password protections, sensitivity, and similar. Total providing web-accessible and useable data (17.7%)

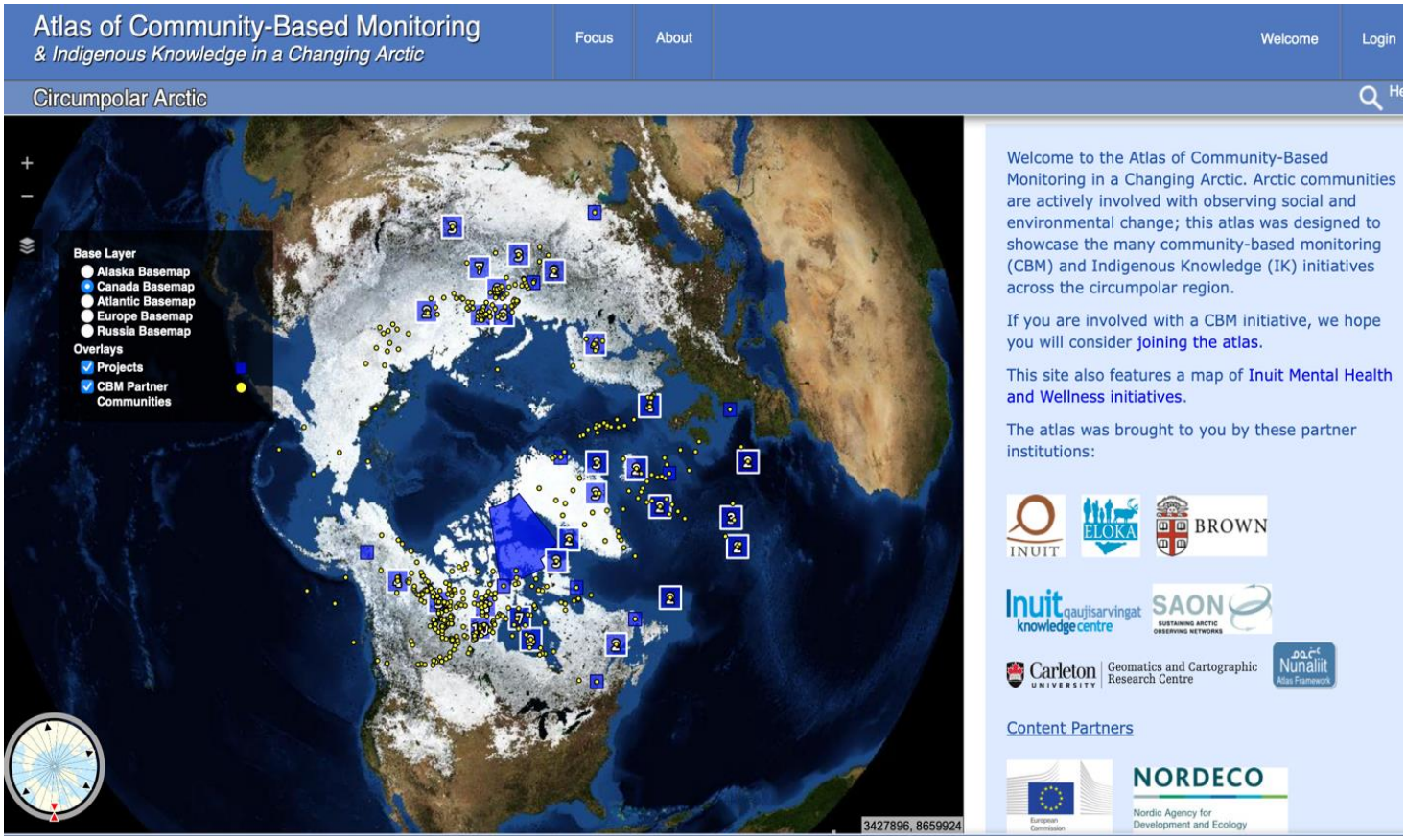

Figure 4. Screenshot of the Atlas of Community-Based Monitoring. Source:

https://arcticcbm.org/index.html

Another critical finding in the presentation was the level of engagement researchers had (or did not have) with communities. While projects in the Atlas are not required to fit within a definition of CBM, there is no universal definition (nor one defined on the Atlas). Upon closer examination of each project, it appeared there were large inconsistencies in researchers' reporting of efforts to engage community members. Some researchers stated activities such as holding community meetings, hiring locals, and working collaboratively with locals to analyze and help in the decision-making process. Most researchers' efforts appeared minimal, such as speaking with IK holders about the project or hiring a bear monitor as the incorporation of IK (Murray et al., 2014). Labeling a project as community-based ought to require a clear explanation of how it is community-based and perhaps examples of community collaboration efforts, as a lack of engagement can lead to community frustrations and resentment towards researchers (Pedersen et al., 2020). One addition that could be added to the Atlas is Danielsen's five categories of community members' involvement in research projects (Table 9), showing a range from completely externally designed to fully locally developed.

Table 9. Role of local and professional researchers in the different categories of natural resource monitoring schemes. Source (adapted from) (Danielsen et al., 2009)		
Category of monitoring	**Primary data gatherers**	**Primary users of data**
1.Externally driven, professionally executed	Professional researchers	Professional researchers
2.Externally driven with local data collectors	Professional researchers, local people	Professional researchers
3.Collaborative monitoring with external data interpretation	Local people with professional research advice	Local people and professional researchers
4.Collaborative monitoring with local data interpretation	Local people with professional advice	Local people
5.Autonomous local monitoring	Local people	Local people

While the Atlas is an important contribution to understanding various CBM projects across the Arctic and Subarctic region, the presentation highlighted many limitations in the ArcticNet presentation, most significantly the usability and utilization of data. As community engaged projects continue to develop and spread across the Arctic and Subarctic regions, it is important to develop research with Indigenous communities. In the following section, I offer the perspectives of residents from Pond Inlet, Nunavut, who have worked with Settler researchers in various citizen engaged projects. The aim of the following case study is to provide specific accounts, insights and recommendations from Inuit who have first-hand experience.

CASE STUDY

Based on the findings from the ArcticNet presentation (Murry et al., 2014), I decided to plan a visit to the Inuit community of Pond Inlet ᑎᑦᑎᒪᓕᒃᑲᖅ (Mittimatalik: 'the place where the landing place is') in the spring of 2016. I was interested in going to Pond Inlet after discovering that there has been and continues to be a considerably large number of researchers going to this community. Pond Inlet is an Inuit community located in the Qikiqtaaluk (Baffin) region of Nunavut (Figure 5). The hamlet of Pond Inlet has a population of approximately 1600 people, of which over 92% are Inuit, with a median age of 23 (Statistics Canada, 2022). The purpose of this initial visit was to meet with community members and get a sense of what some common feelings were towards researchers, research in general, and if residents have experience or thoughts towards CBM. Through a series of discussions with community members and organizations such as the Hunters and Trappers Organization, Ikaarvik, and the Hamlet Council, it was clear that most community members felt frustrated by what can be considered a sense of disenfranchisement and fatigue with researchers and research. Many research projects have taken place in and around Pond Inlet; some have been around for over 25 years (Gauthier, 2020), while others continue to be implemented. The Ikaarvik group took a strong interest in my project and offered to partner him with residents in helping with the project. My community visit aimed not only to document some of the experience's community members had had working on research projects but also to illustrate what did and did not work with researcher's approaches, and to record some potential projects that were of local interest or concern.

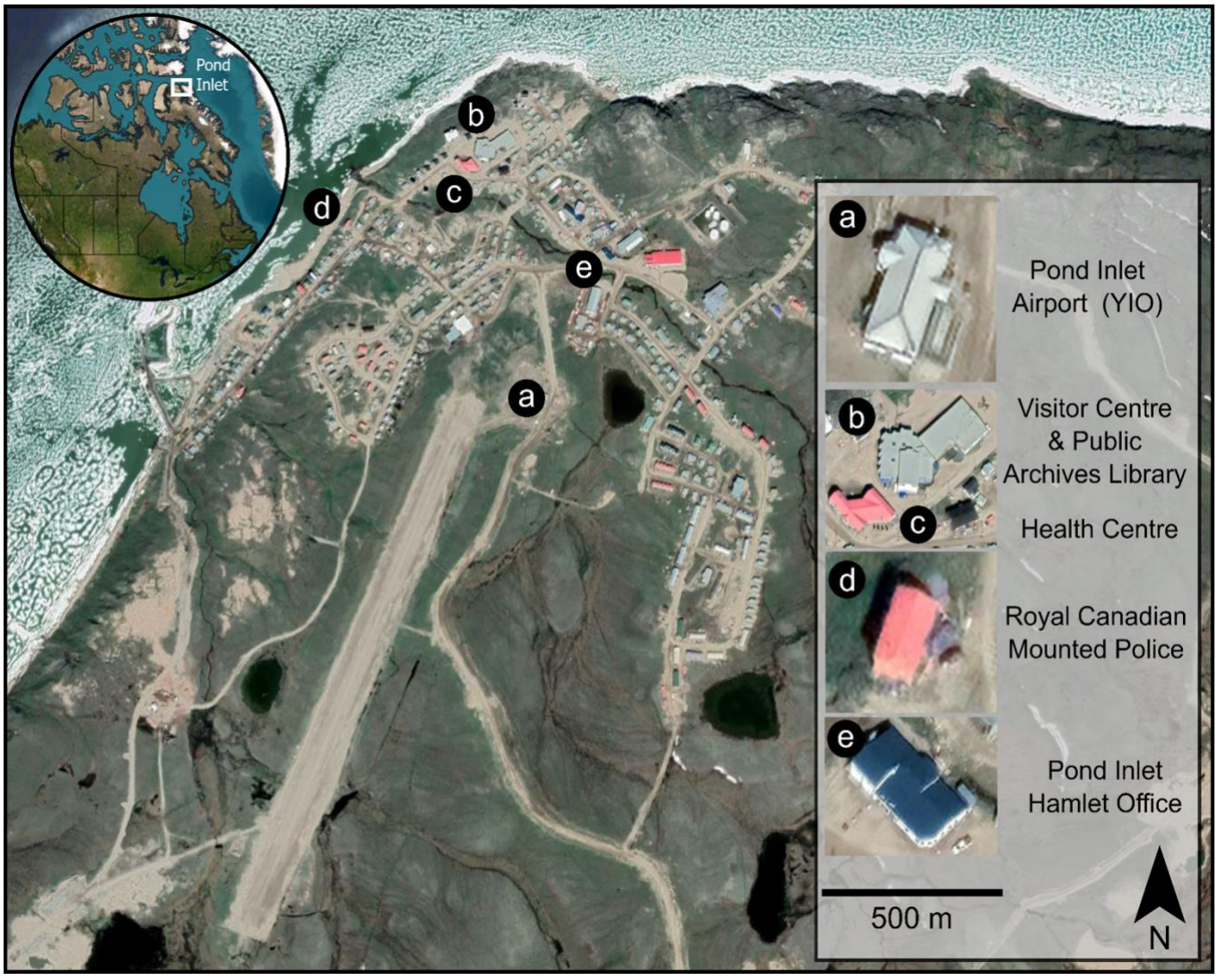

Figure 5. Map of Pond Inlet, Nunavut. Source: ESRI, MXAR, Earthstar Geographics, and the GIS User Community.

METHODS

The following section describes the case study that resulted in recommendations for engaging and reporting to community members throughout the research process and the methods used. The primary approach in Pond Inlet came from the underpinnings of CBPR in which the community was treated equitably in the ownership, design (including formulating the interview questions), data collection and interpretation of the findings. The use of CBPR was chosen by my research assistants and myself as it was believed that process is the most equitable and collaborative out of others such as CS, I used an exploratory qualitative approach (Friendship and Furgal, 2012) to document the perspectives of the Pond Inlet Inuit community members' perspectives concerning researcher engagement locally. This approach is situated within the real-life concerns around research engagement and Inuit perspectives of research in general (Creswell, 2013). I also used a Sequential Transformative design that allows not only for the theoretical perspective of the researcher to guide the study but to also choose the order of data collection as well. It is the results from the methods that come together in the interpretation phase that leads to the findings (centre for Innovation in Research and Teaching, 2020). These for this study are as follows: 1) interviews (data collection) with community members; 2) analysis; 3) and recommendations.

Interviews

In the spring of 2017, I traveled back to Pond Inlet to partner with Ikaarvik to further develop the research project locally known as "researching researchers." The University of Calgary Conjoint Faculties Research Ethics Board (CFREB) approved the project, and the Nunavut Research Institute issued the research license.

Two community members (Ena Maktar and Michael Milton) were hired and trained to assist with the project. Semi-structured interviews were the most appropriate mechanism to document the experiences of some community members who worked with researchers either in the past or presently (Ashford & Castleden, 2001; Huntington, 2000). Both Maktar and Milton helped develop appropriate interview questions for bilingual and monolingual (Inuktitut) community members (Appendix 1).

A total of (N=28) semi-directed interviews were conducted with community members who had experience working with outside researchers. Most interviews were conducted in English (N=24), with some requiring a translator between English and Inuktitut (N=4). All interviews were audio-recorded, and participants signed consent forms, which include assurance of confidentiality. Participants were asked questions related to the type of work they were involved in with researchers, what skills they learned, whether they understood the relevance of what the researcher did to report projects to the community, and whether they were compensated. All participants agreed to have their interview audio-recorded, and most (N=27) did not wish to remain anonymous, which I found interesting and not expected. The reason I found this interesting is that through the university research ethics review process it is implied that participants would prefer to remain anonymous and throughout my experience in conducting

semi-structured interviews I have never encountered individuals who wished to not remain anonymous. Interviews were conducted until a point of saturation was reached; this was determined when the responses were no longer revealing any new information. When the interview was over, a summary of key points was reiterated to the participants to confirm accuracy. Participants were informed that if they wished to add, remove, or change any of their comments, they were free to do so by contacting the project lead before the end of August 2017. All audio recordings of the interviews were later transcribed by me using Dragon speech software.

The interview data were analyzed thematically and organized thematically (Table 10) using an inductive approach (Braun and Clarke, 2006) and coded using the QSR International NVivo 12 qualitative software (QSR, 2018). These codes were compiled and collapsed into themes using method triangulation (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014), which involved an analysis of the associations across the field notes, relevant literature, and the interviews.

What follows are several of the themes that emerged from the analysis of the interview data, an example to illustrate the theme, and a direct quote from one of the interview participants. The entire list of themes is in the appendix.

A recurring theme from the interviews was a desire to see a *change in research approach*. Several participants talk about how they want to see researchers involve the community in a project before it starts and to partner with them in the design and implementation. One participant said,

> "Far too much of the effort is on taking information out, not bringing information in, so every intelligent and knowledgeable person who comes up to work in the North should be bringing something with them to contribute to the community, not just funding or a door

prize, or a publication with somebody's name on it but an actual opportunity to mentor and train and develop the skills that are here" – Anonymous. This also emphasizes capacity building.

Communication was a prevalent theme that came up throughout the interviews. Participants talked about the need for researchers to start communicating with the community before they even arrive and that it is vital to keep that communication ongoing with at least one community representative. Due to a prolonged history of poor communication from researchers to communities there is a default expectation that once researchers are done the community will not hear from them again. One participant said, "All they did was gather their studies and information, send data out, and so far, not much has happened."

The importance of *giving credit* was another key theme across the interviews as most participants expressed frustration around the fact that it is rare for a researcher, government official or other visitor to the community or region to credit Inuit for their help. As one participant said, "The Inuit people who made some of these whalers survive in a harsh winter, and it is still happening here in the Arctic; the Inuit are still helping to survive out on the line, and they are not getting any credits."

It was clear to me that one of the keys to success for a research project in Pond Inlet, is to provide *research opportunities* for community members to be involved beyond being hired as a bear monitor or cook. There is a strong desire to learn the skills that researchers possess to be more engaged in the project and provide community perspectives that could help with the project, especially in making it relevant to the community. One participant stressed, "Always involve the community and hire someone, teach them what they are doing and how to do it. So that this one person is lucky enough to have the experience in the know."

Colonial approaches to research and engagement with the community were another clear theme that participants expressed frustration around. Most participants spoke about examples of researchers coming into the community, conducting research, leaving, and not talking with residents. Another typical colonial attitude felt by participants was that researchers often do not respect IQ and treat it as anecdotal information that simply might end up as narrative in a report or presentation but not taken seriously as science. One participant stated, “IQ, our understanding, what we know and because it is not recorded, scientists do not believe it, and that is one of the issues that some people have, scientists cannot believe it. I wish sometimes they would just believe it; just because it is not written down does not mean it is not real."

Participants expressed similar frustrations based on their experience with researchers as well as ways in which they would like to see the overall approach and engagement from researchers change. It appears that the key element is communication from researchers that needs to start early and continue until the end of a project and perhaps beyond for future work. Researchers can communicate the limitations of their study, for example, a lack of funding to hire more than one person or limitations of time in the community due to a small window for data collection and analysis. By being forthright with the community and adjusting typical approaches to research, there can be greater collaboration and partnerships with communities and researchers.

RESULTS

Table 10 provides an overview of the experiences that participants had while working with researchers. There was a general sense that most approaches were and still are colonial in nature, which is demonstrated by the prescriptive nature of the approaches, lack of acknowledging and utilizing IQ and being informed by Inuit perspectives. Furthermore, the relevance of projects is often not understood, and there is growing frustration with the lack of equitable participation that the participants defined as being given an equal chance to participate in the design, collection, and decision-making from research projects. Lastly, the participants expressed frustration about the lack of Settler researchers reporting back results to the community.

Table 10. Summary of Pond Inlet participant's experiences working with researchers.	
Equity in sharing information with researchers	● Colonial attitudes that the participants felt while working with researchers, they felt the researchers were not respecting their words. ● The legacy of prescriptive research made the participants reluctant to participate in research. ● Participants felt that Settler science outweighed IQ, and oftentimes when IQ was used, it was not done properly and seemed superficial.
The usefulness of data collected.	● Only one research project that was discussed by the participants has demonstrated the usefulness of its data. ● Biological research data appears to take the longest to get results from, and oftentimes those results are shared with the community in highly technical terms that cannot be understood (for example, contaminants in country food). ● Participants who spoke about invasive species research could see species that were not familiar to them but could not be sure what can be or should be done to deal with this issue.
Community needs and interests in research	● Participants felt that most research is designed in the south with little local input. ● Research that does include local participation typically offers roles such as bear monitors or cooks. Participants stated that they want opportunities to participate in data collection and analysis. ● Participants shared that most research projects do not seem relevant to the community's current needs.

	● Repetitive research often made the participants frustrated; even though it was different researchers, the participants did not understand why the same species or issue is being researched. ● The most concerning issue for participants was the lack of reporting back findings to the community. Sending a technical report or article is not enough. Participants shared that using social media, having a community meeting, going on local radio, and providing posters are all necessary when reporting back.

Overall, with these findings' researchers can adjust their approaches to address the above concerns. Participants talked about the prescriptive nature of the research they have been involved in and were aware that it was essential to determine what types of research they would like to see locally. Table 11 summarizes a list of potential research projects that participants would like to see in the community or region. Most of the participants expressed frustration and disappointment with research that did not appear to have any (or very little) relevance to current or emerging needs.

Table 11. A potential list of research projects for Pond Inlet or the surrounding region.	
Marine Ecosystem	● Impacts of increased shipping, invasive and disappearing species, ocean acidification and overall quality, sea ice research, and zooplankton.
Human Health	● Condition of mental health in the community and the feasibility of having permanent doctors and dentists in town. ● Air quality is a concern for many, especially since the airport is in the centre of town.
Species Health	● IQ led research on polar bear health, seals, and caribou.
Climate Change	● IQ partnered with research on climate change. Answer questions such as how much warmer it is now than 10 years ago? What are the impacts the community is witnessing? ● Feasibility study of the effects of permafrost and coastal erosion affecting the construction of homes and buildings.
Socioeconomic	● Research the community's general well-being in terms of jobs, wellness, and access to education and healthcare. ● Impacts of increased tourism, benefits and consequences, and the impact on the environment.
Food Security	● Understand the high cost of store-bought food and its overall quality. ● How reliable is country food going to be in terms of availability? ● What would the cost of a greenhouse be?
Agricultural	● Research the quality of the soil to determine what can be grown during the summer months

Housing	● What can be done about overcrowding and the decline in quality of housing in the community?
Inuit Qauijimajatuqangit	● Develop ways that researchers can properly understand and use IQ in research.

* It was decided that the last interview question would ask participants what types of research they would like to see in their community, the above Table was the result

This list above is a starting point for potential research that participants have expressed interest in seeing done in their community or region. Further community engagement from researchers about local concerns could lead to a much more robust list and increased community interest, engagement, and skill development.

DISCUSSION

While research across the North of Canada continues to grow (Pearce et al., 2009), researchers must be aware of the frustrations Indigenous communities have towards colonial research approaches and adjust their research approach to be more inclusive of and beneficial to the communities they visit/conduct research in. The Pond Inlet interview participants provided examples of the typical mistakes that researchers make in the community, such as a lack of prior consultation or meaningful participation. Challenges exist for meaningful collaboration between researchers and the community; these challenges include a lack of funding to support local research assistants, short timelines for data collection, and a general sense of uncertainty, especially among some disciplines, about how to properly approach a community (Nickels, Shirley, & Laidler, 2006). The interviews provided examples of researcher behavior and practices that frustrated the participants and showed how engagement could be beneficial to both parties. Organizations such as Ikaarvik have spent a tremendous amount of time and resources to provide easy-to-follow steps for researchers (Table 7) to take to break from colonial practices, such as including community members and facilitating a rich knowledge transfer (Pedersen et al., 2020). This paper has highlighted community engaged research approaches that allow researchers and community members to engage in the research process. While not without challenges, Community-Based Participatory Research offers an inclusive process that promotes the co-design and co-development of research that is beneficial to all parties involved (Castleden et al., 2012).

My findings indicate that even though it can clearly be demonstrated that community-engaged research can have multiple benefits for Indigenous communities, there still appears to be

opportunities/concerns from community members regarding research engagement. It appears that social science research projects have gone to great lengths to be inclusive in approach and design, whereas the physical sciences have the greatest opportunities. The work of the Ikaarvik group provides an excellent step by step guide that all researchers can adapt to each community they wish to work in. Despite the concerns from some scholars, CBPR offers the greatest flexibility and adaptability in approach, execution, and utility for collaboration with Settler researchers and Indigenous communities. I believe that the best approach is the one that community members feel is appropriate. Perhaps, a community will recognize that there is an issue of local concern but a highly quantitative study where results are shipped out and returned later with an analysis is what they would like. Or there may be an emerging trend in which a community would like to develop a project that relies heavily on IK and the only linkage with Settler research might be in writing an academic journal to help the community with an environmental policy argument. It is important to also point out that during some of my interviews, there were participants that stated that the little involvement they had in a research project was acceptable to them, they did not want to be engaged any further as it was a short-term employment opportunity that met their needs. This would suggest that a research design such as CS or CBM would be appropriate in some respects, as not all community members or communities desire full integration into the research. What I would like to see in the coming years is Indigenous-led CBPR or form thereof, that is not constrained by academic institutional barriers. The integration of IK and scientific knowledge is one that has been largely underutilized for various reasons. However, we have seen examples such as SmartICE where IQ is being supported using satellite sensors to protect and promote the harvesting of country foods (Bell, Briggs, Bachmayer & Li, 2015). The many institutional barriers such as restrictive timelines, no

funding for relationship building, and ethics procedures may have hindered research projects from taking approaches that work with greater collaboration with Indigenous communities. CBPR and PAR are amongst the two most desired research approaches that meet both Indigenous and Settler scholars' calls to change the prescriptive nature of research. However, this does not suggest that other perspectives such as CBM or CS should be disregarded because what is essential to the design of a research project is the communities desired level of involvement in a project, which can range from no involvement to complete design, implantation, and change. Moving forward, research projects that have taken the time to be led by or equally incorporate IK (IQ) and the direction of community members have been successful in achieving project and/or community goals.

In this chapter, I have advocated for greater utilization of CBPR as it has been hailed by scholars as a more inclusive and the primary difference of it compared to CS or PAR is that at its core it demands that the researcher accept meaning in various forms by allowing for various epistemological methodologies in project design. Both CS and PAR are heavily bound by Settler epistemological orientations that may, at best, lose incorporating IK into the project design. The appeal of this approach for Inuit communities is that it allows them to control the research project, from design to decision-making. A researchers' ideal role, if there is adequate funding and time, is to provide support, guidance, and training at the appropriate times (Danielsen et al., 2007; Kouril, Furgal, & Whillans, 2016). Working together to understand the effects of climate change and to co-develop mitigation and adaptation strategies with Inuit communities is not only in the best interest of the researcher, policymakers, and government; it is the right thing to do (Armitage, Berkes, Dale, Kocho-Schellenberg, & Patton, 2011; S Nickels et al., 2002; Nilsson,

2016). There are several examples of projects that have been led by and incorporated IK into project design, analysis and all the way through to decision making.

CONCLUSION

There are limitations to this study as only 1% of Pond Inlet community members were interviewed. This study was unique in its focus on the perceptions of Inuit community members who have worked with outside researchers; future research will build on this and lead to greater depth and understanding. The testimony and perspectives shared during the interviews reflect only a few individuals, but many others have raised similar issues in Nunavut and elsewhere (David-Chavez & Gavin, 2018; Conrad & Hilchey, 2010; Castleden, Sloan Morgan, & Lamb, 2012; Nickels & Knotsch, 2011). It is not unreasonable to suggest that a paradigm shift in Settler research approaches is needed and that challenging colonial practices to purposefully include IQ, IK and TEK as valid sources of knowledge and analytical approaches is expected. The desire for change among Inuit is clearly articulated in numerous inquiries and documents (ITK 2016; ITK, 2018; Obed, 2018; Pfeifer, 2018). It is important to come back to the point that Inuit communities should have the agency to be able to decide the types of research and ways in which such research is conducted in their community or region. Communities each have a different relationship with Settler research and when being consulted about a prospective project they should be able to ask that their own concerns and local situation be incorporated into the design and implantation of a project. Again, there might be very little local interest in a particular project and therefore utilizing a CBM or CS design would be more appropriate than a CBPR or PR project that hinges on a much greater level of local involvement. The overall process a community would go through to choose the level of local involvement supports similar calls to change to the prescriptive nature of research by Indigenous scholars (Absolon, 2011) and that if research is going to involve Indigenous people, then it needs to employ Indigenous

methodologies (Kovach, 2021). These methodologies would be consistent of Indigenous ontology and epistemology that stresses the importance of interconnectedness and relationality that goes beyond human relationships to include the environment (Wilson, 2008). Settler researchers have the responsibility to acknowledge, understand and fully include Indigenous and Inuit communities' that respect local history and concerns before moving forward with research plans. Empowering communities by potentially developing local, regional, and national policy changes that allows for communities to insist on greater consultation and involvement in research projects in their community could avoid the risk of pan-indigenizing research methods for Indigenous communities that would reflect colonial practices and therefore not support sustainable adaptation solutions to address the local and regional impacts of climate change.

CHAPTER 4: DECOLONIZING RESEARCH IN THE ERA OF RECONCILIATION: A COLLABORATIVE APPROACH WITH INUIT FROM POND INLET, NUNAVUT, AND THE UNIVERSITY OF CALGARY

As I discussed in my previous chapter, research throughout the North of Canada has largely been extractive, prescriptive, unethical, and not included community members in the process or findings (Inuit Tapiriit Kanatami, 2018; Pfeifer, 2018). For example, when International Biological Researchers went to 30 Inuit communities in the 1960s and took skin samples from community members without informed consent or describing the purpose of the research (Canadian Broadcast Channel, 2019). As I mentioned previously, many northern organizations such as the Inuit Tapiriit Kanatami (ITK) and Yukon Native Brotherhood that have been clear in their expectations of engagement with Settler researchers both in the past and in the present (ITK, 2018; Brotherhood, Y.N.,1973). There has been some progress in how Settler research is granted permission and conducted within the Canadian territories. For example, the goal of the Inuit Nunangat Policy "is to promote prosperity and support community and individual wellbeing throughout Inuit Nunangat with the goal of socio-economic and cultural equity between Inuit and other Canadians" (Government of Canada, 2022). However, this policy is only one part of the equation. Inuit communities have had little impact in changing how universities review and grant permission to researchers (Pearce, et al., 2009). There has been a great deal of effort with Indigenization across universities in Canada, but it is not clear that this will result in the changes outlined by Indigenous organizations, communities, and scholars to alter the often-colonial actions and behaviors of researchers (Hayward, et al., 2021 & Stein, 2020). In previous chapter, I have examined processes, protocols, research, and researchers in

communities in Inuit Nunangat (specifically, Nunavut), but this chapter will focus on how collaborative research can meaningfully impact research ethics review and approval processes within universities.

There are a few reasons why I choose to put an emphasis on research ethics boards. First, ethics boards represent the only serious barrier to researchers doing research once they have received grant funding. Ethics boards are the only place where intervention can take place due to academic freedom and autonomy (Prakash, 2011). Second, Indigenous communities have identified research ethics boards as an important part of the research process and many questions arise when research is called into question by community members (Koster, Baccar & Lemelin, 2012; Cross, Pickering & Hickey, 2015). Despite the reasons and the concerns raised by Indigenous community members, organizations and scholars there appears to be little system change in the ethics training and approval process. One of the root causes of this lack of change is the ethics training and approval process for academic researchers (Castleden, Sloan Morgan, & Lamb, 2012). New guidelines for researchers are necessary with Indigenous communities that will incorporate various calls to action and Indigenous people's perspectives to move forward in the spirit of reconciliation.

The history of the establishment of research ethics boards came out of horrendous events that saw the mistreatment of minority groups (Schüklenk, 2000). In the first part of this chapter, I will illustrate a brief history of research ethics, summarize the essential documents that have shaped how ethics have evolved, review what several Indigenous organizations have had to say about ethics and research, and examine the application ethics review boards by universities across academic disciplines conducting research in the North of Canada. In the second part of this chapter, I will detail a case study approach that highlights a research ethics workshop that I

organized and conducted with community members from Pond Inlet, Nunavut, members of the University of Calgary Conjoint Faculties Research Ethics Board (CFREB) and several graduate students. The workshop looked at the current processes that do or do not provide appropriate training to academic researchers at the University of Calgary who work on Indigenous lands, in Indigenous communities, or on topics of concern, and interest to Indigenous people (or not as the case may be). I further examine Pond Inlet residents' concerns about the CFREB ethics review practices that conflict with Inuit cultural, local, and epistemological orientations. There is a national framework that makes very clear and specific recommendations for how researchers should engage in research with Indigenous people that touches on many areas of the research process, education, and research outcomes (ITK, 2018). I conclude with recommendations for ways in which review processes can be adapted, including accommodating cultural diversity, and incorporating guidelines and approaches developed by Indigenous organizations and groups.

In Canada, and globally, Indigenous people have been the subject of countless research projects. Many argue that Indigenous people are the most studied group on the planet (Wilson, 2008). Projects are often imposed on Indigenous people and their communities (Rigney, 1999; Wilson, 2008; Obed, 2018). Indigenous people across Canada have been subjected to grave abuses in the name of research. While it is recognized now that ethics review of research involving human subjects provides a mechanism for the promotion and protection of human wellbeing, it is understood that gaps persist particularly concerning research that impacts Indigenous people (Inuit Tapiriit Kanatami, 2018; First Nations Information Governance Centre, 2014). The Inuit Tapiriit Kanatami (ITK) and the Inuit Circumpolar Council (ICC) advocate for enhancing ethical research conduct across Inuit Nunangat by expanding guidelines to include wildlife and the environment, promoting collaboration between researchers and community

members, and increasing Inuit representation on university research ethics boards (Inuit Tapiriit Kanatami, 2018; Nickels & Knotsch, 2011). ITK's mission is to promote "the national voice for protecting and advancing the rights and interests of Inuit in Canada" (Inuit Tapiriit Kanatami, 2020). Similarly, ICC represents over 155,000 Inuit across Alaska, Canada, Greenland, Chukotka (Inuit Circumpolar Council, 2020). Many Indigenous authors have argued for a different approach to research ethics that respects Indigenous knowledge systems and promotes Indigenous methodologies (David-Chavez & Gavin, 2018). To break from colonial constructs and embrace the desired approaches and applications from Indigenous organizations and authors, many researchers often refer to Kirkness and Barnhardt's "four R's of respect, relevance, reciprocity, and responsibility" (2001). Kirkness and Barnhardt put forth the four R's to help American Indian/First Nations/ Native people go from being under-represented in higher education. This under-representation has resulted in low achievement, poor retention, and weak persistence. The goal of the four R's is to encourage the education system to "*respect* them (students) for who they are, that is *relevant* to their view of the world, that offers *reciprocity* in their relationships with others, and that helps them exercise *responsibility* over their own lives" (Kirkness & Barnhardt, 2001). Applying these principles when designing a research project can lead to a more inclusive project that is better aligned with Indigenous methodologies (Morton Ninomiya & Pollock, 2017; Castleden, Sloan Morgan, & Lamb, 2012). For example, one of the contemporary concerns among Indigenous communities is the movement for open data and open science. Open data is data that can be used, re-used, and redistributed by anyone with no charge or criteria for use. Open science is the idea that research, academic articles, and data be freely available to anyone (Walter, et al., 2021). Both open data and open science are critiqued by scholars who advance Indigenous data sovereignty (Walter, et al., 2021). The concern for open

data and open science is largely around the issue that many Indigenous communities remain alienated when it comes to using data and that permission to share these data may go against many communities desire for privacy and Indigenous data sovereignty (Walter, et al., 2021 & Tsosie, et al., 2020). Indigenous data sovereignty principles can be understood as Collective benefit, Authority to control, Responsibility, and Ethics (CARE) (Carroll, et al., 2020). The CARE principles are "people and purpose-oriented, reflecting the crucial role of data in advancing Indigenous innovation and self-determination. This includes the right to create value from Indigenous data in ways that are grounded in Indigenous worldviews and realize opportunities within the knowledge economy" (Carroll, et al., 2020). The growing application of open data and open science raises concerns for Indigenous people who aim to reclaim control of data collected about them and shift away from being subjects of research to support self-determination with the application of Indigenous Knowledge, approaches, and practices (Carroll, et al., 2020).

Power differentials and historical practices have posed significant barriers for Indigenous people to collect, utilize, and own their data (S.R. Carroll et al. 2020; S.R. Carroll., R-Lonebear., and Martinez. 2019; 2019; First Nations Information Governance Committee 2007; Torres 2014; Wilson et al. 2020). I emphasize that the reason I chose to focus on the research ethics review and approval process is because it covers all aspects of a project from the design, execution, conduct, data storage, access, ownership, publication, and co-authorship rights. The process does not just account for field work, but it also covers the outcomes, access to the data and ultimately policy outcomes.

Development of Modern Ethical Guidelines and the Research Review Processes

Historical mistreatment and abuse of minority groups, in the name of research, has led to the creation of research ethics boards (Rice, 2008). The modern research ethics review and the creation of ethical guidelines for research can be traced to the Nuremberg trial, which occurred after World War II (Rice, 2008). Nazi physicians were charged with war crimes and crimes against humanity for their deadly medical experiments on concentration camp prisoners without their consent (University of Missouri-Kansas City, 2020; McRae, 2020). At the end of the trial, the Nuremberg Code was established outlining 10 key guidelines as follows: 1) voluntary consent is absolutely necessary, 2) experiments should be for the good of society and necessary, 3) experiments should be based on previous animal experimentation the means need to be justified with the results, 4) all unnecessary physical and mental suffering should be avoided, 5) experiments should not be conducted if there is reason to believe death or serious injury may occur, 6) the risks should never exceed humanitarian importance of the problem that could be solved by the experiment, 7) steps should be taken to protect against any possibility of injury, disability or death, 8) only qualified individuals should experiment, 9) research subjects should be given the ability to end the experiment at any time, and 10) if the researcher believes any injury, disability or death may occur they must end the experiment (Shuster, pg. 1436, 1997). I discuss the Nuremberg Code because it remains key to ethics today and that one of the primary outcomes of these is that it created the recognition of research subjects as free agents (McRae, 2020). Furthermore, the core goal with consent is to allow research subjects free and informed knowledge and decision power to participate in research and to make sure that harm is minimized or non-existent (McRae, 202). These principles remain key to ethics practices.

The Nazi experiments were not the only grave mistreatments and abuses of minority populations. In the United States between 1932 and 1972, the U.S. Public Health Service (USPHS) conducted human research without the consent of subjects, purposefully infecting 400 low-income African American men with syphilis in the *Tuskegee Study of Untreated Syphilis in the Negro Male* (Centers for Disease Control and Prevention, 2020). When subjects inquired about their health status, they were given false information, and subsequently, prevented and/or discouraged from seeking treatment by outside physicians although syphilis can lead to brain, liver, nerve, and heart damage and/or death (Brandt, 1978). The study was stopped in 1973 by the U.S. Department of Health, Education, and Welfare (University of Missouri-Kansas City, 2020) after it became public, but the fallout continued with recent work indicating that it reduced the life-expectancy of the men involved (Alsan & Wanamaker, 2017).

In Canada, there were similar experiments, largely perpetrated on Indigenous people, but also including forced sterilization of people considered mentally deficient and institutionalized under the Mental Health Act (Dack, 2013). Application of the Act varied across the country but for example in Alberta, it was amended to remove informed consent (1937) and broadened in 1942 to allow the eugenics program to identify children in schools, and through public health visits (Samson E., 2015). From 1948-1952, the Federal Government permitted nutritional and dental experiments on Indigenous children living in residential schools, despite clear evidence that such experiments would result in grave harm (Mosby, 2013; Morton Ninomiya & Pollock, 2017). Globally, experiments on Indigenous people were not uncommon; in the late 1960s, the global International Biological Program was aimed at understanding why some skin grafts were successful, and others failed. Researchers descended upon more than 30 Inuit communities and conducted experiments that involved taking a skin sample from one person and grafting it onto a

family member to monitor the reaction. The participants were not asked for their consent and were not aware of what was about to happen until the scalpel cut into them. Decades later, community members have spoken out about this abuse which left lifelong physical and emotional scars (Canadian Broadcast Channel, 2019).

As a result of the years of abuse and harm inflicted on minority populations in Canada, there have been several organizations, often Indigenous, that have written various research protocols, which include principles and best practices, to promote the protection of human subjects (ITK, 2018 & FNHA, 2001). The influence that various reports, statements, and principles have had has led to greater promotion and applicability of informed consent, the rigorous review of projects (to ensure there is minimal harm or preferably none), and legal recourse of unethical research. For example, the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research published the Belmont Report (1979). The report emphasizes three ethical principles: respect for persons, beneficence, and justice (University of Missouri-Kansas City, 2020). Three years later (1982), The Association of Canadian Universities for Northern Studies (ACUNS) published "Ethical Principles for the Conduct of Research in the North", stressing accountability, co-operations, and mutual respect when working with and in northern communities. ACUNS published a follow-up statement (1998) emphasizing community collaborations in research and the importance of understanding of cross-cultural contexts (Castleden, Sloan Morgan, & Lamb, 2012). In the same year, the First Nations Information Governance Committee (FNING) published “Ownership, Control, Access, and Possession (OCAP) advocating for local community control of research, choice in partnership, and cultural and social importance of knowledge (First Nations Information Governance Centre, 2014). In 2000, the Canadian Institutes of Health Research (CIHR)

published guidelines closely echoing OCAP, focusing on community choice, control, and focus. Then in 2010, CIHR, the Natural Science and Engineering Research Council (NSERC), and Social Science and Humanities Research Council (SSHRC) (Tri-Council) of Canada published a follow-up to the Tri-Council Policy Statement on the Ethical Conduct for Research Involving Humans which was originally published in 1998. The new statement emphasized respect for Indigenous people and cultures with a focus on their welfare, social justice, and inclusiveness (Tri-Council 2018). This was a monumental step in establishing concrete and legally binding steps to ensure an ethical treatment with respect to working with Indigenous people. Compliance with the policy is now made mandatory to receive federal funding (Castleden, Sloan Morgan, & Lamb, 2012).

Canadian university members who wish to conduct research with human subjects must follow the Tri-Council Policy Statement: Ethical Conduct for Research Involving Human (TCPS 2). It outlines ethical standards for researchers and university research ethics boards; the latter oversees the reviewing proposals and granting research permission. Chapter 9 of the TCPS 2 Core, "Research involving the First Nations, Inuit and Métis Peoples of Canada" provides details regarding ethics within the Indigenous context. The TCPS 2 Core requires all researchers to complete an online course that provides an overview of ethical engagement, consent, and expectations (Kershaw, Castleden, & Laroque, 2014).

One of the challenges with the TCPS 2 Core Tutorial is that it uses complex language, and it is not user friendly, which has negative implications for Indigenous and other non-academic communities who may wish to better understand the training and preparation researchers must adhere to. There is often a lack of awareness within Indigenous communities about the TCPS 2 guidelines and its expectations of researchers, which introduces challenges for

ways community members can report incidences of unethical behavior (ITK, 2018). The course does not capture Indigenous (and specifically, Inuit) societal and cultural values, including respect and care for the land, wildlife, and the environment (The Government of Nunavut, 2020), as this is a key concern for many Indigenous communities, this knowledge gap does not adequately prepare researchers. Many Indigenous epistemologies do not categorically organize people, animals, and the environment in a hierarchical structure as Settler science does (Wilson, 2008). Hence, research involving people, plants, rocks, and animals are not treated equally with the same safeguards and permissions required to respect Indigenous epistemology (Hart, 2010). Wildlife research does require ethics clearance unless the research design seeks knowledge from community members. The TCPS 2 is the guiding document for ethical engagement when it comes to research involving people. In Indigenous contexts, it does not provide valuable information and training as there is a gap in its framework such as understanding differing epistemological viewpoints and therefore can result in not adequately preparing students for community work.

The NISR report stresses the concern of the lack of Indigenous representatives from communities on university ethics boards; therefore, Indigenous perspectives are absent when reviewing research proposals (Inuit Tapiriit Kanatami, 2018). TCPS 2 Core and university ethics certification often mean very little to Indigenous communities as it is reflective of the continued colonial practice reinforced through the ethics training and certification process, which is seen as paternalistic and unnatural (Nickels & Knotsch, 2011; Inuit Tapiriit Kanatami, 2018) For physical/natural science graduate students, it can be challenging to respond to the concerns related to engagement and research design because these disciplines simply have not gone to the great length to engage in ways to address the issues of consultation, engagement, and

communication that have been raised by an organization such as ITK, TRCC, or OCAP. Often, it is seen that adhering to the ethics guidelines and incorporating community members' wishes for consultation and engagement can be seen as in conflict with each other. Shifting this perspective is necessary to create more inclusive and meaningful research (Henri et al. 2020). In the previous section, I reviewed major Canadian guidelines, calls to action and protocols that have been written by Indigenous organizations, the Federal government and communities that call for changes in the colonial nature of research but there continues to be a disconnect. In the section that follows, I will discuss the Indigenization efforts of the University of Calgary and go into detail of an ethics workshop that I organized with the University of Calgary and some residents of Pond Inlet, Nunavut.

Ethics reviews at Canadian universities vary depending on the nature of the study and which one of the Tri-Council agencies (if any) is providing the funding for the project. Differences in agency mandates are delegated by federal legislation; different criteria are enacted depending on the type of research (Government of Canada, 2018). For example, veterinary medicine research that involves animals requires a valid Canadian Council on Animal Care Certification that stresses animals are only to be used if no alternatives are possible (Canadian Council on Animal Care, 1989). In contrast, ethics guidelines for research involving human subjects vary based on the methodology, type of data collected, the participant population, and the local jurisdiction (Division of the Vice-President, Research & Innovation, 2019).

One issue seldom addressed is that there are generally no requirements to obtain ethics approval from any potentially affected Indigenous community unless a project involves human subjects research (Castleden, Sloan Morgan, & Lamb, 2012). This is a concern for many Indigenous communities because, as Cree scholar Shawn Wilson writes, environment, animals,

and ecosystems have the same rights and protections that humans do within many Indigenous epistemologies" (Wilson, p.99, 2008).

Research permission requirements differ across Canada's northern territories. Table 12 provides a breakdown of the various territorial requirements.

Table 12. Requirements for Research Across Northern Canada

Territory	Details
Yukon	● Obtain a Scientists and Explores Act Licence. ● Requirements vary depending on the nature of the study. ● Mandatory consultation with First Nations if the project will occur within their land and approval is required.
Northwest Territories	● Licenses are granted through the Aurora Research Institute. ● Depending on the nature of the study there may be several permits required. ● Local community involvement is emphasized.
Nunavut	● Research licenses are granted through the Nunavut Research Institute. ● Requirements vary depending on the nature of the study. ● All printed documents, the project proposal, and the interview guide must be translated to Inuktitut.
Nunatsiavt (Northern Labrador)	● All researchers are required to contact an Inuit Research Advisor before obtaining licensing. ● The Nunatsiavut Research Centre issues research licenses.

	● All projects are reviewed by the Nunatsiavut Government Research Advisory Committee.
Nunavik (northern Quebec)	● Projects are reviewed and issued licenses from the Kativik Regional Government. ● Reviews of the project are done by a harmonization committee to ensure compliance with Federal and Territorial requirements.
Yukon Government, 2008; The Aurora Research Institute, 2011; Nunavut Research Institute, 2018; Kativik Regional Government, 2013.	

The reason these above requirements are different across northern Canada can be linked to land claim agreements between the territory and the Crown. While most of these requirements are similar, there are differences that are reflective of land claim agreements. For example, in Nunavut the requirement for all documents, the project proposal and interview guide to be translated into Inuktitut can be associated with its self-government (Nunavut Research Institute, 2021). Another difference is that community consultation is mandated in Yukon but not in any other territory, which can be linked to the Yukon having several self-government agreements with Yukon First Nations (Government of Yukon, 2019).

Universities across Canada may have institutional-specific research ethics review protocols and boards, but all must adhere to mandates set out by the Tri-Council (Government of Canada, 2018). However, even though there are federal guidelines and standards in place for universities to receive grant money there is no standard for how universities construct, manage and execute their ethics training and review process, therefore these processes, board

composition, and safeguards vary widely (Castleden, Sloan Morgan, & Lamb, 2012). For example, the University of Calgary has two research ethics boards, three animal care committees, and a biosafety committee; all charged with the review and administration of approval for research. Studies that involve humans, animals, or biohazards are required to be reviewed and approved before any research takes place (University of Calgary, 2020). At the University of Alberta, there are four Research Ethics Boards (REB) for research involving human subjects. REB 1) reviews research involving in-person interview or community engagement, REB 2) reviews research where privacy and confidentiality are involved, REB 3) is the health research ethics board-health panel that reviews all non-invasive health research, and REB 4) reviews all invasive health research; both boards exclude cancer treatment research. For animal research, the university has an Animal Care and Use Committees (ACUC) which is tasked with reviewing research involving the use of animals (University of Alberta, 2020). For research involving biologically hazardous material, a project is required to obtain registration and a review by Biosafety Officers (University of Alberta, 2020). Furthermore, at the University of Saskatchewan research involving human subjects must be reviewed by the Research Ethics Board for approval. Any research involving animals is reviewed by the University Animal Care Committee. For research that uses controlled goods, the office of Research Services advises the researcher on any necessary steps for use of those goods (University of Saskatchewan, 2020). Doing a cursory scan across these boards, board members span different faculties, some include community members, some do not. But board member membership often varies due to capacity (as these are often volunteer positions). While these three universities have similar structures in place to review and approve research projects, they do vary in size and level of review, as well as approval procedure. Here, I have outlined only 3 universities' ethics procedures, but I hope I have

demonstrated how widely they vary. It is a glimpse into the huge variations in ethics compliance and practices across Canada.

CASE STUDY

Pond Inlet ᒥᑦᑎᒪᑕᓕᒃ (Mittimatalik: 'the place where the landing place is') is an Inuit community on Northwest Baffin Island in the territory of Nunavut (Figure 9).

Figure 6. A research team prepares to inspect a SmartICE sensor approximately 25 km away from Pond Inlet. Photo Credit: Kent Spiers, March 2018

In Spring 2018, the community Facebook page, 'the Pond Inlet News', received a post from a university student inquiring about accommodations for an upcoming visit to the community. Several community members responded to the post asking the student the purpose of the visit, to which the student replied, "research purposes". The student's response to the questions about the purpose of the visit was vague and appeared to cause confusion with the community members. After further inquiries from the community, it became clear that the student wanted to conduct interviews about their feelings towards Baffinland, which is an iron ore mine close to the community. The student stated that their visit was part of their supervisor's larger project around resource development in the North of Canada. The community members on the Facebook page were unaware of this research project nor did they know how they would be involved or what benefits this project would bring to the community, as the student did not offer clear responses when asked those questions. The student stated that any testimony offered would be cited for later publication in an academic journal and that the community would receive a final report of the project. This was not satisfactory. It was clear that as questions continued, and concerns were not being addressed that the student was getting frustrated as they most likely did not anticipate these questions. Several community members stated that they need to have a better understanding of the project, such as how their testimony would be used and how they could have direct involvement in the project. Questions continued and it appeared that community members were not interested in the project, in fact, it was clear that they were frustrated with the student's lack of preparation, assumptions, as well as the timing of the visit as it was during an annual community event.

In what seemed like a final plea to put community members' concerns at ease, the student stated that the project was cleared by their university ethics board. For the student, having the

project approved by the university ethics board is the last step before conducting fieldwork. However, this led to further questions about that board's knowledge of the community and what local representation was on the board. This is yet another example of long-standing, and unacceptable colonial attitudes concerning research (Simonds & Christopher, 2013) in Indigenous communities. Indigenous people have consistently stated their frustration with these attitudes and what they consider repetitive research. Many Indigenous communities want their research priorities to be known, respected, and to equally participate in the entire process, from design to decision making, to implementation, and publication. This is not the case for every community, some may not have the capacity or interest to be involved in a research project, but gaining that understanding is key. As a result, researchers need to find the funding to compensate for time for community members to be involved in the project as well as respect the wishes of communities that might not want to participate. What is clear is that university approved research might not meet community-level approval. The incident with the student and community members of Pond Inlet is critical. It illustrates the continued failure to align academic approaches to research with Indigenous Peoples' desire to achieve research sovereignty (David-Chavez & Gavin, 2018; Carroll, 2020). It highlights the disconnect between the university ethics approval processes and Indigenous recommendations for how to conduct research and to obtain free and prior consent.

Typically, if university members conduct research that involves human subjects (people), ethics approval must be obtained from the university ethics board first before research begins. The ethics approval process ensures risks imposed on participants are minimized and prevents any liabilities for the university (Castleden, Sloan Morgan, & Lamb, 2012). In Canada, university-based researchers must complete an online course, the TCPS 2 Core Tutorial, based

on the Tri-Council Policy Statement (TCPS 2) before submitting an ethics application to their home institution (Government of Canada, 2020). The application requires information about the project design, consent forms, interview guidelines, the collection and storage of data, recruitment of participants, research licenses/permits, and, most importantly, identifies what will be done to minimize risk for participants (University of Calgary, 2020). Approval to conduct research is granted when all conditions are met; this is often considered the last step in obtaining what might be considered as a social license to operate, giving the researcher the sense that they can freely conduct their research. For example, the incident with the student on the Pond Inlet Facebook Page shows that the student felt they had met all the requirements by obtaining their university research approval. In the previous section, I provided an overview of some of the major concerns Indigenous communities and scholars have raised about the colonial nature of Settler research, presented each territorial guidelines that is in place that Settler researchers must follow to conduct research, reviewed three major Canadian universities ethics boards and processes, and introduced my case study of Pond Inlet Nunavut. In the next section, I will discuss the major calls to action, guidelines, and protocols in place in Canada that helped to shape and guide my ethics workshop that I organized and conducted at the University of Calgary with residents from Pond Inlet, Nunavut. I was primarily inspired to organize this workshop because of this conversation that occurred on the Pond Inlet Facebook Page, and I felt it was important to have a more in-depth conversation with community members and people responsible for reviewing and approving northern research at a university.

National Background with Respect for Reconciliation with Indigenous People

In 2008, the Truth and Reconciliation Commission of Canada (TRCC) was convened to establish a new relationship of mutual recognition and respect between the Indigenous people of Canada and the Crown (TRCC, 2015). The TRCC publicized details of the horrific experiences of residential school survivors and established 94 Calls to Action to start a renewed process of reconciliation (Crown-Indigenous Relations and Northern Affairs Canada, 2019). Many of the systemic social, economic, and political disadvantages that Indigenous people faced are directly linked to the long-term impacts of residential schools, and in the case of some Inuit, forced relocation to the High Arctic (Castellano, Archibald, & DeGagné, 2008). Further compounding this matter are continued colonial approaches, which often exemplify a failure to understand and respect Indigenous ways of knowing (Inuit Tapiriit Kanatami, 2018; Parson & Ray, 2018).

In 2014, Prime Minister Justin Trudeau acknowledged the Crown's colonial practices and behaviors and reaffirmed the need for a government-wide shift in approach (Campion-Smith, 2018). Since then, Canada has launched a national inquiry into Missing and Murdered Indigenous Women and Girls, increased investments in housing to attempt to deal with overcrowding in Indigenous communities and on reserves, increased funding to provide clean drinking water to communities, dissolved the department of Indigenous and Northern Affairs Canada (INAC) and created two new departments: Indigenous Services Canada and Crown-Indigenous Relations and Northern Affairs (Crown-Indigenous Relations and Northern Affairs Canada, 2019; Northern Health, 2020). So far, what has not appeared to change is Tri-Council ethics requirements.

The private sector has also responded to the TRC calls to action. The Canadian Chamber of Commerce released the report, “Coming Together, Making Progress: Business’s Role in Reconciliation with Indigenous Peoples" (The Canadian Chamber of Commerce, 2017). The report illustrates how the TRCC’s calls to action can be incorporated through promoting business ventures in partnership with Indigenous communities.

Concerning Canadian universities, three of the 94 calls to action focus explicitly on the need for fundamental changes in research approaches:

> Call 53: iii “develop and implement a multi-year National Action Plan for Reconciliation, which includes research and policy development, public education programs, and resources.”
>
> Call 63: iii “Building student capacity for intercultural understanding, empathy, and mutual respect.”
>
> Call 65: “We call upon the federal government, through the Social Sciences and Humanities Research Council, and in collaboration with Aboriginal peoples, post-secondary institutions and educations, and the National Centre for Truth and Reconciliation and its partner institutions, to establish a national research program with multi-year funding to advance understanding of reconciliation” (Truth and Reconciliation Commission of Canada, p, 5-7, 2015).

These Calls to Action not only provide an opportunity for Settler research to support policy development and education but to also create resources that help with supporting reconciliation. There are potential implications for academic disciplines that are traditionally not involved in working with Indigenous people and their communities to gain this experience. The other implication is that there is an opportunity for the funding agencies in Canada to change how they support research by investing in research that understands and implements reconciliation.

Many Canadian universities have subsequently announced plans to develop strategies that aim to promote Indigenous ways of knowing, provide Indigenous Knowledge courses and spaces, and establish new research programs (Samson N., 2019).

The TRCC calls to action speak to the need to foster a more inclusive and respectful relationship between researchers and Indigenous communities. The Inuit Tapiriit Kanatami (ITK), the national organization that represents Inuit in Canada across Inuit Nunangat, echoes this in its publication “National Inuit Strategy on Research (NISR)” (Inuit Tapiriit Kanatami, 2018).

GUIDING DOCUMENTS FOR WORKING WITH INDIGENOUS PEOPLE

National Inuit Strategy on Research (NISR)

The NISR goals are to identify and illustrate Inuit objectives related to academic research. It calls for a renewed approach and sets out several recommendations such as "respect[ing] the role of Inuit in decision-making when it comes to research involving our people, wildlife, and environment" (Inuit Tapiriit Kanatami, 2020). NISR stresses the need to facilitate respectful and beneficial research for all Inuit, which it summarizes into five priorities areas within the strategy: 1) advancing Inuit governance in research; 2) aligning funding with Inuit research priorities; 3) ensuring Inuit access, ownership, and control over data and information; 4) building capacity in Inuit Nunangat research; and 5) enhancing the ethical conduct of research" (Inuit Tapiriit Kanatami, 2020). Additionally, ITK has identified ways to address the lack of Inuit engagement in the ethics approval process. Those are: 1) hold institutions accountable for adhering to existing ethical research guidelines; 2) develop Inuit-specific ethical research guidelines for all research conducted in Inuit Nunangat; 3) create transparency in the review and oversight of research across Inuit Nunangat; and 4) broker Inuit partnerships with Research Ethics Boards (REBs)" (Inuit Tapiriit Kanatami, 2018). While the NISR is a necessary starting point, it is important to highlight that its focus is national and regional and may not necessarily reflect the needs and desires of individual Inuit communities. In this sense, the NISR replicates a colonial perspective - that Inuit and Inuit communities have homogenous values, concerns, and beliefs, which may or may not be accurate. Furthermore, while the NISR outlines needed changes to typical research approaches, it is unclear how to

implement these changes. Even though this guideline exists and is easily accessible there is a disconnect between guidelines such as this and university training for researchers. For example, in the situation I cited earlier on the Pond Inlet Facebook page, the graduate student was not aware or did not know how to apply the steps outlined in NISR. Perhaps, in addition to taking the TCPS 2 Core Tutorial that is required by the Tri-Council, there needs to be region specific training if researchers wish to engage with Inuit communities. Communities and Indigenous organizations can put out documents and guidelines, but they lack the power to enforce researchers to follow these. The Tri-Council can restrict, deny, or take back funding that does not follow its guidelines and therefore is a powerful actor that could impose greater adherence to Indigenous calls to change colonial actions and behaviors of researchers. Another important document in Canada that clearly articulates Indigenous People's wishes when it comes to data collection, analysis and storage is the Ownership, Control, Access, and Possession guide, authored by FNING (OCAP, 2004).

Ownership, Control, Access, and Possession

The Assembly of First Nations produced "Ownership, Control, Access and Possession (OCAP)," as a guide for policymakers and researchers to understand First Nations People's expectations for research conducted with them and in their communities (First Nations Information Governance Centre, 2014). The OCAP principles should be a guiding document for researchers, in any discipline, who plan to work with or for Indigenous communities. In fact, the TCPS 2 Core Tutorial states "researchers should consult their own institutions to ensure that the application of OCAP or other community-based ethics codes is consistent with institutional

policies. Where divergences exist, they should be addressed and resolved prior to the commencement of the research" (Tri-Council, 2022). OCAP lays out several principles regarding the use and sharing of information to maximize the benefits (capacity building) and minimize the harm (environmental degradation) resulting from research (First Nations Information Governance Centre, 2014). Also, it stresses self-determination in research and strengthening community-based research skills to promote capacity building. Information collected from communities needs to be shared and the First Nations must have the control and ownership of any data collected, including Indigenous Knowledge. Mechanisms need to be in place to promote community involvement in research and incorporate community principles and values. OCAP is a response to the frustrations First Nations have with research that has taken place in their communities for many years. Even though the TSPS 2 Core Tutorial stresses OCAP, it is not a mandatory part of the training and is not required in most universities.

University of Calgary's Indigenous Strategy

In 2016, the University of Calgary embarked on a journey to implement an Indigenous Strategy with the commitment to truth and reconciliation, "in a good way" (University of Calgary, 2017). The strategy has four key focus areas: 1) ways of knowing: teaching, learning, and research (this refers to epistemology and theoretical concepts); 2) ways of doing: policies, procedures, and practices (the process of validation and agreement); 3) ways of connecting: relationships, partnerships, connections to land, and place (acknowledging respect and our interconnectedness with each other and the environment) and; 4) ways of being: campus identity, inclusivity, leadership, and engagement (communal responsibility and reciprocity that reflect

respect for all). These focus in the strategy reflect values and beliefs held across southern Alberta Indigenous communities (University of Calgary, 2017). Decolonizing research is one of the challenges faced by research-intensive universities, and colonial approaches are consistently reinforced through the lack of equal recognition of IK, the dominance of Settler science methods, limited inclusion of Indigenous people involved in research projects, and by university ethics training and approval process (Morton Ninomiya & Pollock, 2017; Nickels & Knotsch, 2011; Inuit Tapiriit Kanatami, 2018). The strategy offers an outline to rethink and creates new and innovative ways to move forward with Indigenous people, their lands, and communities. However, there are some concerns with this strategy. It focuses on Treaty 7 people and focuses on engagement with communities in Treaty 7 that might not be applicable to other Indigenous regions and communities across Canada. The University of Calgary supports a wide range of research from coast to coast, to coast as well as international research that involves any number of Indigenous people and communities and therefore this strategy may lack depth and understanding of different forms of knowledge and epistemological orientations. It is important that questions are raised about how all universities engage with local communities, adhere to their treaty obligations, and engage in research with Indigenous people, communities, and belief systems.

METHODS

I carried out two approaches to develop a set of recommendations that describe ways to change the research ethics training and review process, and research with Pond Inlet. I used an exploratory qualitative research approach (Friendship and Furgal 2012) to explore Inuit participants' perspectives on university ethics procedures and researchers' engagement. An exploratory qualitative research approach is a methodology that examines research questions and qualitative data that has not been studied in-depth. I also used a case study approach to situate the real-life concerns around research ethics training and certification, and Inuit' perspectives of research in general (Creswell and Clark 2011). I used a Sequential Transformative design that allowed for my theoretical perspectives to guide the study and organize the data collection (centre for Innovation in Research and Teaching, 2020). A sequential transformative design promotes the explanation of findings by using a researcher's narrative and theoretical perspectives to guide and interpret research findings in a structure's manner. The order included interviews with community members, data collection and analysis, and workshops with recommendations.

Interviews

I conducted semi-directed interviews (N=28) (Ashford and Castleden 2001) in the spring of 2017 in Pond Inlet with community members who had experience working with outside researchers. All interviews were audio-recorded, and participants signed consent forms, which included assurance of confidentiality. The University of Calgary Conjoint Faculties Research

Ethics Board (CFREB) approved the project, and the Nunavut Research Institute issued the research license. Questions related to being recruited to work with outside researchers, types of research projects, compensation, skills development, the relevance of projects to the community, and ways researchers reported to the community were explored. The interview questions did not include the topic of ethical conduct. See the interview guide (Appendix 1). Most interviewees however raised issues related to ethics on their own. Interviews were conducted until a point of saturation was reached. The point of saturation was determined when the responses in the interviews were no longer revealing any new information or themes from the previous interviews; therefore, it was no longer advantageous to continue more interviews. Upon the conclusion of each interview, I summarized the key points and reiterated them to the participants to confirm accuracy. Participants were informed that if they wished to add, remove, or change any of their comments, they were free to do so by contacting the project lead within one year.

The interview data were thematically analyzed and categorically organized using an inductive approach (Zehr et al. 2016) and coded using the QSR International NVivo 12 qualitative software. These codes were compiled and collapsed into themes using method triangulation (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014), which involved an analysis of the associations across the field notes, relevant literature, and the interviews. In part, the themes identified in this analysis were used to develop the ethics workshop that occurred in the Fall of 2018.

Research Ethics Workshop

In response to the incident on the Pond Inlet Facebook page, which occurred during the 2017 community visit, and the emergence of themes related to ethics concerns, I worked to organize an ethics workshop. Most of the interviewees discussed their frustration with what they saw as unethical conduct of researchers and the organizations that permit research to take place in or around Pond Inlet. Even though inquiring into research ethics was not part of the original project design, I felt that it was an opportunity to develop an ethics workshop, to better understand Pond Inlet residents' frustrations. Since my research project was aimed at understanding the specific behaviors and actions that Settler researchers should adopt when it comes to work with Inuit in Pond Inlet, I saw this ethics workshop as an opportunity to discuss and understand how research ethics training and approval process can better train Settler researchers and ultimately change the colonial nature of research. My goal for the workshop was to take the community members of Pond Inlet through a discussion of how graduate students and researchers go about obtaining approval from their university, engage with members of the ethics board and speak directly to researchers to have a better understanding. I also saw this as an opportunity for the community members to specifically call out what their concerns are with the training and approval process and provide specific examples of what they would like to see changed.

In the fall of 2018, four Pond Inlet Inuit community members and team leads for the Ikaarvik project (Ocean Wise, 2020) were invited to attend a three-day ethics workshop at the University of Calgary. There was a total of three Inuit community residents and two project co-leaders representing Ikaarvik and eight members of the Conjoint Faculty Research Ethics Board

(CFREB) that participated in the workshop. I worked with Ikaarvik when I was conducting my fieldwork in Pond Inlet and when I discussed the ethics workshop, they were interested in participating. The Ikaarvik participants have worked closely with researchers and have consulted with researchers interested in conducting research in Pond Inlet. They have stressed that projects need to align with community priorities, including community members, and reporting back the result in acceptable mediums is essential. The purpose of the workshop was to set forth Inuit community-specific recommendations on the University of Calgary ethics training and approval process that could potentially be applicable for research in general. The workshop was funded by Ikaarvik, the Vice-President of Research at the University of Calgary, the Department of Anthropology and Archeology at the University of Calgary, the Arctic Institute of North America, and the (CFREB). In what follows, I will discuss what occurred on each day of the research ethics workshop as well as the specific findings in table 14.

Day 1

The then-Chair of the Conjoint Faculties Research Ethics Board (CFREB) was invited to participate in the workshop, which began with an explanation of the origins of the project. This included a discussion of the incident on the Pond Inlet community Facebook page, Inuit perspectives of research, and experiences working with researchers. The Chair then discussed the research training and certification process that students and researchers must go through and answered questions from participants. The goal was to encourage the participants to express their perspective on ethics guidelines, define various types of research, explain how they describe ethics, and to obtain a clear understanding of university ethics procedures. Participants asked a series of thought-provoking questions regarding the rationale for having university research

ethics boards, how Indigenous worldviews are understood (or not) and represented on ethics boards, and the overall process of granting permission to research projects in Indigenous communities.

Day 2

Members of CFREB joined the workshop and discussed a series of concerns expressed by the participants such as the lack of Inuit representation on the board, the nature of the criteria used to grant ethics clearance for research in communities, and ways in which community members could express concerns about a particular project or researcher to the University. The discussion allowed participants to raise concerns about the ethics evaluation process and allowed the CFREB to consider ways to address these concerns in the ethics process adequately. Further discussions included the criteria that the ethics board uses to evaluate research projects, the various ethics requirements across academic disciplines, and what community members can do to report a researcher whom they feel is acting unethically. Gaps in the ethics certification process were highlighted; participants also talked about the lack of scientific literacy in the community, the use of consent forms, and how the community would benefit from training in this area that could potentially lead to the development of a local ethics board. It was agreed to continue discussions and to explore ways to work together to decolonize the process, building community capacity, and explore the development of local ethics documents (and/or) a board.

Day 3

The workshop's last day was an opportunity for reflection with the CFREB and brainstorm recommendations for the University of Calgary, and the day concluded with a panel

discussion, with graduate students, primarily from physical science disciplines. Participants on the panel shared their experiences with graduate students and researchers in general and focused on the need to work together. They also stressed the importance of engaging community members and hiring local people on projects. This was also an opportunity for graduate students to share the obstacles that they face that result in the lack of community engagement. The students talked about supervisors' deadlines that do not allow for community consultation, short windows for fieldwork, lack of funding to spend the extra time in the community, and an overall lack of knowing how to conduct community consultations.

RESULTS

Table 13 provides the themes identified from the interviews with community members in Pond Inlet as well as a description of each theme. The name of the themes was co-developed by my research assistants and myself and are based on the shared responses from the community members. They are grouped together to synthesize and outline issues of common concern.

Table 13. Coded Themes from Community Interviews (Spring 2017)

Theme	**Description**
Behavior of Researchers	Participants talked about the need for researchers to change how they approach the community. For example, asking the community for help in the research design.
Colonial Approach (examples)	Some examples are, telling community members instead of asking about the research projects design, research funding mostly going to southern institutions, and the continued use of consent form being written in academic jargon. At the same time, many people do not see the purpose of a consent form.
Communication (typical)	There is a minimal effort made to communicate with the community. Researchers typically say they will do a lot, but once they get clearance from the Hunters and Trappers Organization or Hamlet they disappear. Results are rarely reported back, and if they are, then they are not presented in understandable terms.

Communication (desired)	This begins by laying out a concrete reporting plan with community organizations. Involving community members in the planning of reporting is key; they can identify the best medium for this (radio, social media, flyers, talks, booths, handouts, and reports).
Community Engagement (Relationship Building)	Crucial to the success of a project. Talk with organizations, community members, schools. Go on the radio, social media, set up booths at stores, and hire locals. Participants talked about the need for researchers to build relationships with community members by being themselves. Time to allow for the opportunity to get to know people is vital to community participation and acceptance of a project.
Effects of Research	Some positive effects such as research involving youth and passing on that knowledge, but there is a legacy of research that is traumatizing for many community members, especially health research. Research is seen as necessary, especially considering climate change and how Inuit Qauijimajatuqangit (Indigenous Knowledge) does not have the answers to address many of the rapid changes being experienced in and around the community. Research methods, as related to polar bears, are seen as highly controversial.
Ethics	Community members view ethics differently than researchers. For community members, research on the land, animals, and the environment is

	the same as working with people. It is considered unethical to conduct any research without respecting traditional ways and knowledge.
Experience with Researchers	Some positive encounters, especially when permitted to participate in data collection. Some participants stated that they did not know the purpose of the research projects and rarely heard what the project's scientists discovered.
Giving Credit (to Inuit)	Participants talked about the need to credit them and their ancestors for research as well as about events such as RCMP coming into the community. Many stories were shared about how Inuit helped RCMP survive in the Arctic with no credit given.
Interest in Settler Science	There is a tremendous interest in science, building skills and working on a list of community-prioritized research projects.
Opportunities for Involvement	While there are some opportunities to be involved in research, the criteria are often very limiting; researchers do sufficiently communicate job opportunities; the timing for research (i.e., summer) can limit involvement.
Research Approaches	Participants shared examples of the “right” and “wrong” approach when working with the community. There is no one size fits all, each project is different, each community is different, but the fundamental key is to include the community in the process and align a project that maximizes the benefits to the community.
Research Fatigue	Community members shared their frustration that many projects appear identical or very similar and questioned if southern researchers shared their

	findings with each other. Failure to clearly explain how they differ from one another makes community members frustrated and tired.
Research from the Community	The community would prioritize several projects, including air quality monitoring, understanding the high cost of groceries, and the health/safety of country food.
Inuit Qauijimajatuqangit	Inuit Qauijimajatuqangit can be defined as traditional knowledge or Indigenous Knowledge, but it is also much more than that as it is a way of being and understanding. There is a concern from elders that IQ needs to be preserved as communities are changing rapidly, and they are worried about losing this understanding.
Settler Science versus Inuit Qauijimajatuqangit	While both approaches or understandings are often seen as divergent, the Ikaarvik group has sought to build a better understanding of how to interpret and use IQ and mainstream science approaches together.

Table 14 provides the analysis of the workshop notes using a content analysis of the notes and recommendations from the ethics workshop at the University of Calgary that may lead to changes in the ethics training and approval process, which can have implications for other universities and research in general. It is important to note each community is different and therefore, approaches may vary; however, some steps can be broadly applicable – initial contact, visiting, speaking with community members or representatives, and learning the local research interests/needs are some of the examples. It also needs to be recognized that some communities

may not wish to engage with researchers at all due to long-standing impacts from colonization and ongoing colonial approaches.

Table 14. Topic and Recommendations from the Ethics Workshop

Topic	Description / Recommendations
Divergent Epistemologies	Research on the physical environment and animals should require ethics clearance, as Inuit Societal values do not place humans above the physical environment.
Best Practices	● The first visit should have no set agenda but to meet with community organizations and leaders. ● Align the project with community needs and partner with the community in the design and implementation of the project, "be flexible". ● Allocate time in the project to build skills with the community members. ● Hire locals as assistants for all aspects of the project, not just data collection, from design to discussion. ● Walk around the community, visit schools, meet with local organizations, use social media to introduce yourself, attend community events, and talk on the radio. ● Report findings directly with the community by visiting, using social media, local radio, and writing plain language summaries.

Researcher Behaviour	● Many researchers appear clinical in their interactions with the community. It was suggested that they take a friendlier approach by demonstrating humility and respect, “be a friend”. ● Support local businesses but be cautious not to arrive in town and purchase large quantities of groceries, therefore, leading to higher prices for residents. ● Walk around the community and engage with residents as a “friend” before talking about research.
Funding	● Community members talked about a desire for research funds to come directly to the community instead of to southern universities. ● Projects need to allocate funding to visit the community first and align research priorities, hire locals, and report back to the community.
Ethics boards	● Have community representatives on university ethics boards. ● Build the capacity within the community to grant ethics clearance to researchers, which would provide researchers with a community ethics certificate as well as educate community members on how to address unethical behavior from researchers. ● Using someone Indigenous but not Inuit to grant permission for a research project for an Inuit community is considered bad form.
Consent	● Despite efforts to create consent forms in plain language, they are often still "too scientific." ● A consent form can be used, but the researcher should partner with a community member when writing it to use the correct language.

	● It was expressed that most community members feel that oral consent is enough and that if someone sits down to do an interview, they have given consent.
Student Obstacles	● Lack of funding to travel to a community strictly for building relationships or reporting findings after the completion of a project. ● Supervisors may not provide support in terms of time and funding without wanting data. ● It is not clear how to hire locals to help with data collection. ● Ensure best practices of engagement with the community.

The above issues highlight some of the differences between Settler and Indigenous world views (Wilson, 2008) and provide specific examples not only where these tensions exist but also ways in which researchers can be aware of and alter their approach when it comes to community engagements. It also provides community voices for desired changes in researcher behavior, funding, ethics boards, and consent.

DISCUSSION

The participants from Pond Inlet expressed their concern that researchers continue to repeat behaviors and mistakes by previous researchers, and they identified that through the research ethics training and approval process and the outcomes from the research ethics workshop. The community members stated that the most important issue is that not all researchers dedicate much time working with the community where their research is taking place. This can especially be true when a researcher is conducting research close to but not inside a community; therefore, it may not be evident to them that the community may feel that the research can harm local people and the environment. I provide table 13 “Coded Themes from Community Interviews (Spring, 2017),” because I used those themes when having the initial discussions with the Chair of the University of Calgary CFREB. The themes helped to illustrate that while a great effort is made by many Settler researchers to be more inclusive and behave in a way that Inuit community members have asked. However, there are still concerns that the way in which Settler researchers are prepared for fieldwork through the ethics application and approval process is not adequate to address long standing concerns of community members. For example, the theme “Behavior of Researcher” talks about community members' desire to help co-design the research. The challenge with this is that the ethics process requires researchers to provide the research design before approval can be granted, which suggests that changes to the design that might be done when the researcher arrives in the community would require re-review and approval of the ethics board. Another example, the theme “Ethics" reveals how part of Inuit epistemology levels humans, the environment, and animals; humans are not regarded as a higher form of life than the environment, plants, and animals. There is no hierarchy that exists. There

are concerns around the fact that physical science researchers do not require ethics review and approval if they are not involving human subjects. One interview participant, Brian, from my fieldwork in Pond Inlet had this to say about polar bear research "The Inuit were saying research is bad for those type of researchers, it's still wrong and they wanted less invasive forms, better research…".

Community members stressed that what is done to a polar bear, or a glacier very much affects everything and that they are frustrated that these researchers have free will when in fact what they do has implications for the community. Table 13 was also a guide for me when creating the ethics workshop to develop an outline for the three days that could touch on the major themes that emerged from the community interviews. While ethics was not a topic that came up with each interview, the theme provided a roadmap of topics that can be linked back to the ethics training and approval process. For example, the theme "colonial approach" talks about the frustration community members had around the use of consent forms. The frustration was that community members felt that by agreeing to be interviewed that was them giving consent, it also created a record of the conversation that would be stored in a southern researcher's office and so there is mistrust around what that might be used for.

Overall, my expectations of the ethics workshop were that it would be an important opportunity to talk about concerns directly from community members where they relate to ethics training and approval processes. Since this was a new initiative, I did not expect that we would be able to accomplish much more than having a rich discussion and sharing ideas. I also saw it as an opportunity to introduce community members to part of the process that graduate students go through when wanting to conduct research in Inuit communities. This was the first time the University of Calgary CFREB had the opportunity to sit down and speak with community

members from Pond Inlet and this group as members of Ikaarvik has a lot of exposure and experience with Settler researchers that they could speak to. The community members that spoke with the CFREB wanted to express their frustrations with the ethics training, review, and approval process. Particularly, they discussed the use of consent forms, lack of training to researchers that are Pond Inlet specific, limited incentives, the lack of knowing or having the resources to contact the CFREB if they felt a researcher was acting in an unethical way, and the lack of community and Inuit representation on the board. When planning this part of the workshop, I did not have an agenda. It was a first meeting, and I knew that Ikaarvik would want to share their thoughts and so I had an organic conversation where it was knowing that there was frustration with the process, but that frustration was not directed specifically towards the CFREB.

It was my impression that members of the CFREB wanted to hear directly from the community members about their frustration and ask what things should be changed about the ethics training, review, and approval process. It was clear that there is a general lack of understanding in the community of Pond Inlet about what the ethics process means and how they can speak out to a university if they feel a researcher is being unethical. One of the ideas that the CFREB was interested in was going to Pond Inlet and talking with community leaders and residents about research ethics, helping to build that knowledge capacity, and potentially piloting community level aspects to the review process. Several great ideas and interests were shared over the workshop, and I believe that expectations were met for each party. Of course, the limited timeframe of three days did not provide a lot of opportunity for the development of more specific next steps and recommendations, but it was a successful first step.

When the workshop was done and I coded the topics, I later shared them with the Ikaarvik group to see if there was anything missed or something that needed further elaboration. We did have some discussion around most of the topics and suggestions to clarify the recommendations but overall, they felt that what was listed was what they also took away from the workshop.

The topic that generated some rich discussion was around divergent cosmologies. The Ikaarvik group emphasized that the ethics process fails to account for how important the protection of the environment is to them and that since physical science research is not required to undergo ethics review, there is growing tension around this topic. Most of the topics that emerged over the course of the workshop were apparent based on previous discussion with Ikaarvik and knowing what the ethics process involves. One of the topics that was a surprise to the CFREB was researcher behavior and specifically this idea of 'being a friend.' A few of the board members were asking questions about what that would look like, what suggestions community members would have to facilitate this, and shared how that can be an obstacle because limited funding often does not allow for much time to spend on topics not related to the research. When the Ikaarvik group met with the graduate students during the panel discussion on day three, it was a bit of a surprise to them to learn that some students experience the obstacle of having a supervisor that does not support extra time to involve the community in the design or involvement with their research. These students, who were from the physical sciences, stated that their supervisor does not allow for trips to build community connections because of budgets and that there needs to be some data collected or some results found to justify a trip. This goes against or at least does not facilitate the recommendation in the topic of "best practice" that suggests having an initial visit to a community with no agenda.

Another topic that Ikaarvik brought up with the CFREB was consent and how they felt that there needs to be significant changes to how the forms are written and there is a strong desire to get rid of the forms as it in most cases does not seem necessary. Members of the CFREB were open to discussing changes to how the forms are written but were hesitant to engage in ways to get away from a signed form or documentation that consent was given and witnessed before an interview began. The other topic that generated some disagreement was Ethics boards. Ikaarvik members asked if a community member from Pond Inlet sat on the board. The CFREB said that there was not a community member or anyone who identified as Inuit but that there was Indigenous representation on the board, and that they looked at all research proposals related to working with Indigenous communities. The CFREB recognizes that this is a shortcoming but was not able to offer a different solution. The Ikaarvik group suggested that members of the CFREB come to Pond Inlet, meet with locals, talk about ethics, and see if there is an opportunity to include someone from the community. The suggestion was also made that perhaps there is an opportunity to increase capacity around understanding how locals can evaluate, question, and decide if a research project should be permitted to move forward in the community or region. This conversation emphasizes the importance of board composition and that including non-academics and great Indigenous representation is key. In this workshop, there was an emphasis for a local component, but diversity is vital to addressing research ethics concerns.

Overall, there were a few suggestions made during the workshop. The most important recommendations made by Ikaarvik where to change and potentially get rid of consent forms, encourage graduate students' supervisors to allow for initial visits to the community, spend time with no agenda in a community, build relationships and develop ways that community members can be included in the design, execution, analysis, and presentation of the research. There

seemed to be initial interest from the CFREB and Ikaarvik to continue to work together to develop a Pond Inlet specific ethical guideline or procedure that should be explored for future research. I believe that there are several topics and recommendations that could be applicable for a generalizable Inuit specific guide or procedure such as understanding and respecting the divergent epistemologies between the Settler state and Inuit cultural values. Including Pond Inlet in a pilot project to develop an ethics training, review and approval process would be a necessary first step before creating an ethics procedure that could be applicable across Inuit Nunangat. It is reasonable to assume that a project of that nature could help to change the ethics process when it comes to working with Indigenous communities across Canada.

When considering the topics and recommendations from the ethics workshop and key documents like TCPS 2 Core, OCAP and NISR there are some logical connections and intersections. In the TCPS 2 Core Tutorial, it clearly states, "the guidelines in this policy are based on the following three core principles: respects for persons, concern or welfare, and justice" (TCPS, 2022). Each of these principles lines up with what was discussed in the ethics workshop, but there is a disconnect with the language used in this document Indigenous epistemologies. For example, when considering the principles of concern for justice, there are several agreeable aspects to this such as "Treating people fairly and equitably does not always mean treating people in the same way" (TCPS, 2022). However, when thinking about Inuit epistemology that regards the environment and animals as having the same inherent rights as humans, this is missing in the TCPS principals.

In the Ownership, Control, Access, and Possession (OCAP) document that was produced by the First Nations Information Governance Centre (FNIGC), the principles of OCAP are clearly in alignment with the ethics workshop topics and recommendations. Where there is more

elaboration is in ownership, and possession within OCAP. Those two principles stress the importance of First Nations communities collectively owning and taking possession over the cultural knowledge, data and information shared or created by a research project. During the ethics workshop, it was implied that Pond Inlet residents would also own and take possession of the same things and in the same manner but what was addressed as a barrier was the lack of capacity to store, catalog and maintain official records of research projects in the community.

The NISR by the ITK has the most in common and aligns with the topics and recommendations from the ethics workshop. It can be argued that all five priority areas of NISR (you can find these on page 123 of this dissertation) align with the topics from the ethics workshop. For example, in the workshop, the topic of funding came up from the Ikaarvik participants. They specifically talked about the importance of having funds come directly to the community to conduct their own research, which is like the priority area of NISR that states: "Current policies that structure federal Inuit Nunangat research funding processes tend to curtail Inuit self-determination in research and consequently marginalize Inuit research priorities (ITK, pg.31, 2018). Furthermore, the topic of best practices specifically recommends allocating time in a project to build skills with community members, which supports the priority area of building capacity in Inuit Nunangat research. The ethics workshops align with the guidance, protocols, and priority areas of the TCPS 2 Core, OCAP and NISR. The ethics workshop outcomes provide more clarity and specific recommendations that have been made in Pond Inlet and maybe applicable in other Inuit communities.

It is also worth discussing that there are barriers and obstacles for universities to align with the various calls to action, priority areas and recommendations made by Indigenous scholars, organizations, and communities particularly in the ethics training, review, and approval

process. University ethics protocols establish protection of human subjects from undue harm; however, these protocols are deeply rooted within colonial practices such as deciding what is the best approach on how to proceed with clearance for research in Indigenous communities and traditional territories without Indigenous engagement and guidance (David-Chavez & Gavin, 2018). Several factors challenge collaboration including a lack of funding, project deadlines, and a general sense of uncertainty about how to properly approach a community (Nickels, Shirley, & Laidler 2006). Decolonizing ethics clearance to facilitate a mutually beneficial research process is a critical step to improving collaboration and building a meaningful research relationship with Indigenous communities (Castleden, Sloan Morgan, & Lamb, 2012). Workshop discussions highlight some of the barriers students face when working in Indigenous communities; however, what students might not be aware of is that community members can provide guidance on collaboration and that challenging the status quo can be necessary to change colonial practices. Research approaches such as Community Based Monitoring (CBM) or participatory research, including Community Based Participatory Research (CBPR) and Participatory Action Research (PAR), are often recognized as advantageous when wanting to work in or around an Indigenous community. These methodological approaches promote co-design and co-development of research with Indigenous people at all stages of the project (Castleden, Sloan Morgan, & Lamb, 2012). CBM and CBPR support a process where the Indigenous community largely controls decisions about research design, execution, data/information analysis, and decision making with support from outside researchers (Kouril, Furgal, & Whillans, 2015; Pollock & Whitelaw, 2005; David-Chavez & Gavin, 2018; Castleden, Sloan Morgan, & Lamb, 2012; Conrad & Hilchey, 2010; Danielsen, et al., 2009). Developing an ethically appropriate and mutually agreed-upon

approach is in the best interests of researchers and communities (Castleden, Sloan Morgan, & Lamb, 2012 and Styres, Zinga).

Potential Policy Implications of the Pond Inlet-CFREB Ethics Workshop

Universities in Canada must follow a prescribed process of granting ethics clearance from the Tri-Council to receive research funding (Castellano, Archibald, & DeGagné, 2008). While recognizing the importance of training researchers on ethical engagement to protect participants, more work is needed to address Indigenous Peoples' concerns and their communities. University ethics boards should partner with Indigenous communities, especially if there has been a history of research from that university in or around a community, to develop community-specific ethics clearance protocols, and to create community-level ethics boards. At the end of the University of Calgary Ethics Workshop, both the ethics board and participating community members agreed to work together to understand how to change protocols and practices for research conducted by the University in or around Pond Inlet. The benefit of partnering with communities is that it will foster strong relationships with universities, allow for community members to ask and partner on specific research projects, and can lead to increased skills development and increase community research capacity. It is understood that this will require extensive consultation with communities, but it is the best way to move forward.

In this era of reconciliation, engaging with Indigenous communities respectfully is necessary. Researchers need to collaborate and to foster engagement not only to increase benefits for Indigenous communities but to explore the opportunity to bring IK and Settler knowledge together that could lead to greater research outcomes for all (Friendship and Furgal 2012).

Decolonizing the research process requires a fundamental shift in research approaches and practices and must include incorporating values and principles in a way that is recognizable and meaningful to Indigenous communities. This is no small undertaking, but it will lead to a more equitable research landscape (Inuit Tapiriit Kanatami, 2018). Indigenous communities need a mechanism and the capacity to review research proposals, engage with the researchers directly, and ultimately grant permission for researchers to research within their traditional territories that will benefit both community members and researchers. While each territory has established its own permitting requirements for research, the critical piece missing for most communities is the ability for community approval for research.

CONCLUSION

This study has its limitations as only a miniscule percentage (~1%) of Pond Inlet community members were interviewed. The perspectives reflect only a few individuals, but similar issues have been raised by many others (David-Chavez & Gavin, 2018; Conrad & Hilchey, 2010; Castleden, Sloan Morgan, & Lamb, 2012; and Nickels & Knotsch, 2011). Furthermore, this study is from a Canadian perspective and therefore may not be applicable to other countries with similar concerns. Nonetheless, a paradigm shift in research and ethics approaches in this era of reconciliation with Indigenous people and their communities are needed. The desire for change has been clearly outlined by national inquiries, organizations, communities, and individuals (ITK 2016; ITK, 2018; Obed, 2018 and (Pfeifer 2018). It is evident that there are significant epistemological and other barriers that are required to rethink research ethics. As Linda Tuhiwai Smith states when discussing Settler vs Māori concepts of research

> "From an Indigenous perspective Western research is more than just research that is in a positivist tradition. It is research which brings to bear, on any study of Indigenous people, a cultural orientation, a set of values, a different conceptualization of such things as time, space and subjectivity, different and competing theories of knowledge, highly specialized forms of language, and structures of power" (Smith, pg. 49, 2021).

This demonstrates that there clearly needs to be further research into areas of "research subjects" and what constitutes "consent." In terms of how it is obtained while considering individual vs community consent. These challenges are rooted in Settler colonial ideologies such as anthropocentrism, the privileging of the individual above community consent.

I believe that Settler researchers have the responsibility to acknowledge and understand the history and concerns of Indigenous communities before moving forward in partnership with

them on research projects. Ignoring these histories and concerns will limit our ability to work together with Indigenous communities, expand our knowledge systems, maintain respect, and gain trust from them.

CHAPTER 5: CONCLUSIONS

The purpose of my dissertation was to understand the role Settler researchers can play in co-designing and working collaboratively with Inuit communities to find innovative and ethical ways to develop adaptation programs in the face of climate change. I also wanted to bring attention to the use of community engaged research projects when working with Inuit communities and offer a more inclusive and holistic approach to research that encourages Indigenous epistemologies to take a lead role. My research offers different points of view: the perspectives of some residents from Pond Inlet, Nunavut, the recommendations from youth from the Ikaarvik ScIQ workshop in Cambridge Bay, Nunavut, and an analysis and understanding of observations I made. In the following section of this conclusion, I will discuss the strengths and limitations of my research, cover recommendations that have emerged from this research, and finally, discuss some concluding thoughts.

Strengths and Limitations

My dissertation tackled a complex and multifaceted research question about ways Settler researchers can and should approach working with Indigenous communities, challenge colonial structures in academia, and encourage the centring and prioritization of Indigenous epistemologies. Settler researchers can build strong relationships with Inuit communities ethically and collaboratively. In my mixed-methods approach, I conducted semi-structured interviews. I was able to engage with residents in Pond Inlet in a way that allowed me to learn

and understand different perspectives as each resident's experience working with outside researchers offered multiple insights. The content analysis I carried out allowed me to understand that there are different power structures within the colonial state when it comes to Settler research. This power structure and differential is also apparent in various levels of government, from provincial, territorial, and federal all the way down to municipal and hamlet-level. Colonialism continues to perpetuate imperialist institutions and processes that restrict the application of Indigenous methodologies in Settler research (Liboiron, 2021). The research ethics workshop in this dissertation research was a form of participatory research that led to specific outcomes and deliverables for the residents of Pond Inlet who attended, as well as the ethics board members. Although the sample size was small, I could gain meaningful answers to my research question and develop clear and actionable outcomes. The small sample size may limit generalizability beyond Pond Inlet. However, it is possible that the ways this research project was conducted, along with some of the activities, there is an opportunity for other communities to engage in similar work. I believe that the outputs and some of my conclusions apply in other contexts, but it is necessary to keep in mind that each community is unique. We must therefore pursue future research in this area, if other scholars and community members agree. The brief relationships between myself and the interview, workshop, and summit participants are also a limitation but might be addressed in the future as I plan to continue to work in Nunavut.

Recommendations

There are multiple ways that future researchers may pick up where this project ended. The following list of recommendations emerged from my research and were put together primarily by myself, also from discussions I had with my research assistants in Pond Inlet and the Research Ethics Workshop. By no means is this list exhaustive, it could be regularly reviewed to help shape future research and it is my hope that in the short and long term there will be progress in the areas below.

1. Universities and colleges should encourage faculty within all departments to engage within themselves and their students about Indigenous Knowledge and epistemologies.
2. Universities and colleges should foster a collaborative and collegial environment for Indigenous faculty and students to conduct Indigenous research.
3. The federal, territorial, and provincial governments should continue to act on the Calls to Action from the Truth and Reconciliation Commission.
4. Federal, territorial, and provincial governments should educate their employees about Indigenous Knowledge and epistemologies to create a better understanding and encourage ways to incorporate that into different departments.
5. Research funding should be changed in order allow for students to travel to a community and build relationships with community members before research begins.

6. Research funding should also be allocated from the Tri-Council to Indigenous communities that desire to conduct their own research instead of having to find research partners in universities, colleagues, or industry.
7. University ethics boards should partner with Indigenous communities to help build local capacity that leads to the ability of community members to be able to analyze and be critical of proposed research within the community or region.
8. University ethics boards should partner with Indigenous communities to engage in further discussions of how to decolonize the research ethics training, permitting and approval process.
9. Settler researchers should co-design and work collaboratively with Indigenous communities and foster a collegial relationship to address local concerns.
10. Settler researchers should be encouraged to allow Indigenous community members to lead a research project with Indigenous methodologies and epistemologies. If there is a desire by community members to complement aspects of the research project with Settler research that should be supported.

What is necessary to point out is that these recommendations are based on my research. As I have discussed in other sections of my dissertation, most of the research funding for Canadian academic institutions comes from the Tri-Councils. Tri-Council funding is provided to academics with specific criteria attached, which includes deadlines for results, limited timelines for when funds will be distributed, cut-off dates for funding, as well as limitations of what funding can and cannot be used for. While community engaged research

continues to grow in popularity the funding structures remain a constraint, particularly when considering long-term sustainability and maintenance of programs (Cohen, et al., 2021).

Several of my recommendations ask for universities and colleges to encourage faculty, staff, and students to engage in, promote, and support Indigenous epistemologies, research, and cultural understandings. I recognize that many universities and colleges have invested time and resources to do just that. However, I believe there is considerably more that can be done to see progress in this area. Not only will it require greater structural investments that engage in decolonial practices, but it will also require considerable individual reflection and work. Individuals will need to have personal motivation and a willingness to engage in these areas for there to be progress in these areas. I believe that within the Settler population in Canada we are seeing more and more individuals take a personal interest in understanding Indigenous cultures, act in good faith towards the TRC Calls to Action and educate themselves on the impacts of colonialism. Having academic intuitions foster more collaborative environments with Indigenous epistemologies and research along with individual desires to act in good faith, I believe we will see tremendous progress.

When it comes to permitting structures to approve academic research across the North of Canada there are structural limitations, which provided insight into several of my recommendations. While university ethics boards are important and in place to protect the intuitions and research subjects, they are limiting when it comes to respecting the various Indigenous cultural protocols and expectations. For example, in Pond Inlet, there were several community members that spoke about Settler researchers coming in with pre-designed projects that rejected proposed changes because they stated that their university

ethics board had already approved the project. For changes to be made to a project the Settler researcher would need to go back to the ethics board, propose the changes and await approval. This can be time consuming and with funding constraints, this type of collaboration is often not possible. However, as I recommended, I believe that university ethics boards should make a concerted effort to work with Indigenous communities to find common ground and facilitate ways to work together in collaboration.

While I am optimistic that we will see progress in reducing and perhaps eliminating these colonial power structures, it is important to point out that academia is not the only industry involved in research. There are other industries such as mineral exploration and exploitation that engage in similar types of research that further compound colonial practices and limit progress in the recommendations I have listed in this section.

Future Research and Reflections

This dissertation and the work that I did throughout it have the potential to move into multiple different directions. When I started this research, I originally planned to focus only on community-based monitoring efforts, but as I spent time in the community and reflected on my position as a Settler researcher, I realized there were more opportunities. For example, I created the research ethics workshop and did a thorough content analysis of my fieldnotes and various government documents. I believe that future research, particularly in decolonizing the research ethics training, review and approval process is needed and would be beneficial to Indigenous communities and research institutions alike. Further work on fostering research environments

that are collegial and support collaborative designs with Indigenous and Settler epistemologies is necessary to address current and future environmental and socio-economic issues.

I want to continue my work in Nunavut because not only do I cherish the connections I have made but I also feel that there is a lot of opportunity to determine new and innovative pathways for Settler researchers to work closely with Inuit communities. I believe there is room to improve various processes, such as research ethics training and approval, and to seek further collaboration with universities around the design of climate change adaptation projects. I do believe there will be further insights and innovation into ways to move forward with decolonizing university practices, but I do not believe we will ever be done with decolonization. Colonization is still an ongoing process that is perpetuated by imperial organizations and structures such as universities and Settler research ethics training, review, and approval process.

In the introduction of my dissertation, I discuss my positionality as a white male who is a Settler colonial researcher. There is no doubt that my positionality impacted how my research was conducted and thus influenced the outcomes. First, the funding structures in Canada favor me as a Settler colonial researcher who was based at a university in Calgary. I was only able to acquire funding because of where I was located and the role that I would play for the colonial state. I have discussed how this should change but I recognize that this is no small task and that there must be an institutional willingness from the Tri-Council and universities to facilitate this. It is evident that I am very critical of the ethics training and approval process currently in place in Canada for Settler academic researchers to work with Inuit community members. Due to the lack of opportunity for Inuit to engage in training about research ethics and approval processes, I was able to obtain approval from my university which allowed me continued access to research

funding and colonial approval to conduct research. I see this as another form of privilege and advocate that this needs to change as we progress through this era of reconciliation and seriously change how research is approved and conducted with Inuit communities. One of my observations was that even though I had a very specific role as a student of anthropology I was made aware that I represent the many colonial institutions that have impacted Inuit communities. I was often asked about the need to lower the cost of food, the wrongful imprisonment of friends and family members, the critical condition of housing, and reminded of the wrongful actions of many Settlers. While I was limited to my personal or professional opinions in these matters, I understood that the need to share who I was and that the action of "being a friend" first is critical in building relationships because my presence in the community represented the face of many colonial institutions.

As I mentioned in my positionality statement in the introduction, I see myself as, and would encourage other Settler researchers to be an ally with Indigenous communities. By investing time in gaining a better understanding of Indigenous epistemology, Settler researchers would have a more holistic understanding and could see how Settler epistemology is different. With that understanding, Settler researchers could also see how colonial institutions continue to further expand and hold onto colonialism. It is also vital that Settler researchers understand the challenges and struggles that Indigenous people have and continue to experience. It is my belief that being an ally is truly developed when a Settler researcher spends time visiting Indigenous communities and that by building connections and fostering strong relationships there will be opportunities to collaborate with and support Indigenous researchers. I also want to recognize that there are many accomplished Indigenous scholars that reject Settler research and therefore

there is a need to recognize this incommensurability. For example, Lester-Irabinna Rigney stressed that it is not only important but necessary for Indigenous scholars to bring about a different perspective, politics and expertise that rejects Settler ideals (Rigney, 2001). Keely Ten Fingers, addresses the increasing rejection of Settler frameworks for research and suggests that this is necessary to reclaim rights and develop methodologies that are culturally rooted in Indigenous perspectives (Ten fingers & Lakota Nation, 2005). Furthermore, Brayboy, et al., suggest that the very orientation of Indigenous research methodologies is fundamentally different than Settler research. Attempts to align or incorporate these different orientations limits Indigenous research, removes much of the critical elements of its approach and therefore the only way forward is to reject Settler research (Brayboy, et al., 2012).

Collaborative and collegial research that allows for the most appropriate methodologies, methods, and knowledge systems is the most robust approach to deal with the rapid socio-ecological changes occurring across the Arctic and Canadian North. For example, Inuit Qauijimajatuqangit is a knowledge system that has successfully promoted the Inuit culture and values and passed on knowledge to other Inuit that has helped them survive in the harshest conditions on the planet. As the region experiences profound changes due to climate change, Settler research should work collaboratively with Inuit in ways that allow IQ to guide the research process and ultimately lead to adaptation programs that boost community resilience.

We must demand that universities develop innovative and creative solutions to decolonize their training in Settler science to promote Indigenous science, worldviews, and research. These ways of knowing should not be taught tangentially; they should be bridged

together to quickly develop and adapt to our rapidly changing world and usher in a new generation of scientists that reject colonial structures and promote transdisciplinary approaches.

I do believe we will see progress in many areas of reconciliation and climate change adaptation. However, I do not believe that as a society we will ever be finished with reconciliation. This begs the question, is it possible to achieve complete reconciliation? I remain unconvinced because so much harm has been inflicted and, in some ways, it continues because the colonial structures are still in place with no sign that they will or can be dismantled. Colonialism is a part of most aspects of our lives. Some of us carry an incredible amount of privilege that we should use to act in good faith as allies to do all we can to push reconciliation forward and help raise Indigenous people' concerns forward. I realize there are many people with power and privilege that are content with keeping things the way they are, and they may stifle progress.

Finally, it is my hope that we will find new and innovative ways for Settler and Indigenous researchers to work together. I am inspired by seeing the many Indigenous youth and Elder groups that work together to promote cultural values, teachings and practices. I am also encouraged by the growing number of Settler researchers that are willing to understand and acknowledge their privilege and accept the responsibility of Settler colonialism's harms. I know many colleagues that are learning to embrace Indigenous epistemologies and research above their own Settler experiences and epistemologies to move toward a new era of research.

The End.

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APPENDIX

Appendix 1 –Interview Script and Questions

My research is looking at the relationship between community members and outside scientists. Particularly at the engagement or lack thereof to include community members in the research process. I want to understand what elements make a strong relationship with outside scientists and how best they can include community members in their research projects. Because you live in Pond Inlet and there have been several research projects that involve community residents in scientific studies, I would like to hear your experiences and insights into what you feel is necessary to create a mutually beneficial relationship with outside scientists and the community.

The goal of this project is to create a set of guidelines or a framework that informs outside scientists on how they should engage with communities for current and future work.

Would you like to hear more details about the study and how you can participate?

- If they say no, I will respond with "thank you so much for your time" and let them know that they are always welcome to approach me if they change their mind.
- If they say yes, I will continue with the script below.

Description of Participation and Voluntary Informed Consent

Over the next few weeks, I will be in Pond Inlet to conduct interviews with community members. Interviews will either be one-on-one or focus groups and will take the better half of an hour. (*Criteria for interview*: I will be asking you about your experience working with scientists from the south. I would like to know how you were involved in the research project(s), what your thoughts of the project were, and I want to understand how you were engaged and how they tried to establish relationships in the community). You can choose to share as much or as little information with me as possible. You can also choose to remain anonymous- I won't associate your name with any of the information from the interview. Are you interested in participating?

- If they say "no", I will respond "thank you for your time" and tell them they are always welcome to approach me if they change their mind.
- If they say "yes", I will move to the consent form and go over all the sections of the consent form with the participant.

Once the consent form is signed, I will ask if I can begin audio recording the interview.

- If they say "no", I will put the audio recorder away and start the interview.
- -If they say "yes", I will begin recording and start the interview.

Questions

What do you do for a living?

What do you spend your time doing?

What is your favorite thing about Pond Inlet?

Can you please tell me how long you have lived in Pond Inlet?

Do you know any scientists from the south?

- Where are they from?
- How do you know them?

During your time in Pond Inlet, what has your interaction been with southern scientists coming into town?

What scientific projects have you or other members of the community been asked to participate in?

If they have been involved in a project: Can you tell me what your role was with the project?

-What did you do?

- How did you expect or hope to be involved?

- Were you paid?

If they were not directly involved in a project: Do you know what the community members who were involved thought about their involvement in the project?

How have scientific studies impacted you and the community?

What is your opinion on external research in your community?

What are your thoughts on having southern researchers come up and conducting research projects?

How do scientists act/ behave in your community?

What are some specific actions you would like southern researchers to take when conducting research in your community?

If you were to work with a southern researcher, when is the best time of year to do that?

Are there any projects you would like southern scientists in your community to conduct?

Would you be interested in helping create a local guide for southern scientists to reference when they want to come to your community to work on projects?

- What should be included in this guide?

- What do scientists need to know about Pond before they come and when they are here?

Do you know anyone else I should speak with that might be interested in my project?

Appendix 2 University of Calgary, Research Ethics Approval

Conjoint Faculties Research Ethics Board
Research Services Office
2500 University Drive, NW
Calgary AB T2N 1N4
Telephone: (403) 220-4283/6289
cfreb@ucalgary.ca

CERTIFICATION OF INSTITUTIONAL ETHICS REVIEW

The Conjoint Faculties Research Ethics Board (CFREB), University of Calgary has reviewed and approved the below research. The CFREB is constituted and operates in accordance with the current version of the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (TCPS).

Ethics ID:	REB17-1416
Principal Investigator:	Maribeth Murray
Co-Investigator(s):	There are no items to display
Student Co-Investigator(s):	Kent Spiers
Study Title:	Toward Best Practices in Socio-Ecological Sustainability: A Critical Evaluation of Community-Based Monitoring Programs in Northern Coastal North America
Sponsor:	Polar Knowledge Canada Social Sciences and Humanities Research Council

Effective: Wednesday, January 31, 2018 **Expires:** Thursday, January 31, 2019

Restrictions:

This Certification is subject to the following conditions:

1. Approval is granted only for the research and purposes described in the application.
2. Any modification to the approved research must be submitted to the CFREB for approval.
3. An annual application for renewal of ethics certification must be submitted and approved by the above expiry date.
4. A closure request must be sent to the CFREB when the research is complete or terminated.

Approved By: **Date:**

John H. Ellard, PhD, Chair , CFREB Wednesday, January 31, 2018

Note: This correspondence includes an electronic signature (validation and approval via an online system).

Appendix 3. Scientific Research License from the Nunavut Research Institute.

Nunavummi Qaujisaqtulirijikkut / Nunavut Research Institute
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SCIENTIFIC RESEARCH LICENSE

LICENSE # 02 027 18R-M

ISSUED TO: Kent Spiers
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AFFILIATION: University of Calgary

TITLE: Toward Best Practices in Socio-Ecological Sustainability: A Critical Evaluation of Community-Based Monitoring Programs in Northern Coastal North America

OBJECTIVES OF RESEARCH:
The goal of this study is to identify the specific circumstances that prevent or facilitate a meaningful, productive and respectful collaboration among scientists and northern coastal peoples engaged in Community Based Monitoring (CBM) programs. CBM has the potential to positively affect individual and community wellbeing of people through their participation in the co-design and execution of research. I hope to look at programs operating in Pond Inlet in order to understand best practices for satisfying the objectives of all collaborators on CBM programs. With my research partnerships this work will provide a means for assessing CBM programs, and tools to ensure the use of best practices for collecting usable data and information that meets community needs for decision making around coastal resource management. My project has the potential to contribute to policy development, including protocols and conduct for CBM programs.

TERMS & CONDITIONS:

DATA COLLECTION IN NU:
DATES: March 02, 2018-December 31, 2018
LOCATION: Pond Inlet

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Issued at Iqaluit, NU on March 02, 2018

for Mary Ellen Thomas
Science Advisor