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Message from Nunavut’s Science Advisor

I am very pleased to present our compendium of research projects licensed under the Nunavut *Scientists Act* in 2022. The Scientists Act applies across the entire territory of Nunavut and requires that anyone conducting research in the disciplines of health, social sciences, and natural/physical sciences first obtain a license from Nunavut Arctic College (NAC). At NAC, we are committed to ensuring that Nunavummiut are kept informed of the research being conducted in our territory, and have a say in the types of studies that are undertaken and how research is carried out. I encourage you to reach out directly to the research license holders for any of the projects described below to learn more about their projects.

NAC issued 159 research licenses in 2022, which is about 26% more licenses issued than in 2021 (117) and is even larger than the average number of licenses (158) issued in years prior to the COVID-19 pandemic (Table 1). The rapid growth in research activity across all disciplines in Nunavut from 2020 during the peak of the pandemic to 2022 when COVID-19 restrictions were fully lifted in our territory is quite significant. This increase in scientific activity presents many opportunities for Nunavummiut, but also poses some challenges as well.

Of the 159 licenses issued in 2022, 54 were for social sciences research, 72 for physical/natural sciences, and 33 were issued to health research projects.

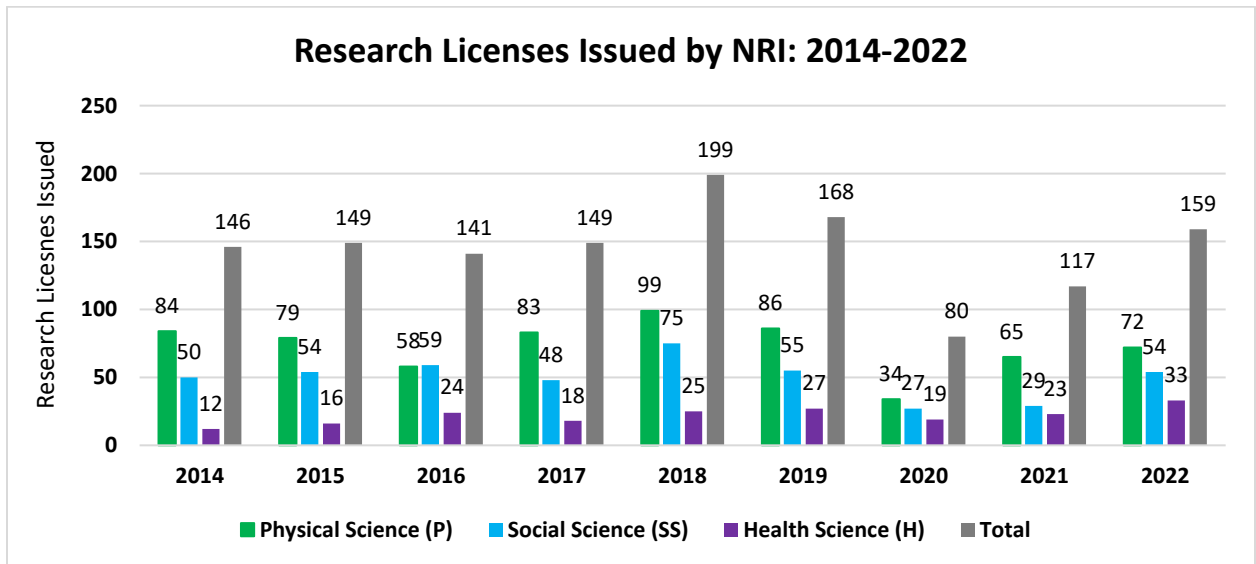


Table 1: Number of research licenses issued by NRI from 2014 to 2022 for physical science, social science and health science research projects.

I applaud the many research leaders and champions across Nunavut communities. NAC is committed to building research capacity in Nunavut, which includes fostering opportunities for Nunavummiut to participate in, learn from, and most importantly, to lead and direct science that addresses the needs of our communities. Research in our territory can only be resilient, equitable, and sustainable if Nunavummiut are directly and

meaningfully involved, and if their contributions are respected and acknowledged throughout all stages of the research process.

We are especially thankful to the many individuals and organizations throughout Nunavut who participate in NRI's research licensing review process and who help us ensure high ethical standards for research in the territory. I again want to acknowledge the many Nunavummiut who designed and led their own research projects, and who provided interpretation, translation, outfitting, guiding, data collection, and other essential expertise to ensure the safety and success of research in 2022.

If you would like to learn more about how to get involved in a research project, or if you have any concerns that a research project may be causing harm or disruption in your community or in the environment, please do not hesitate to contact our office.

For more information about the NRI and our programs and services, please visit our website at www.NRI.nu.ca.

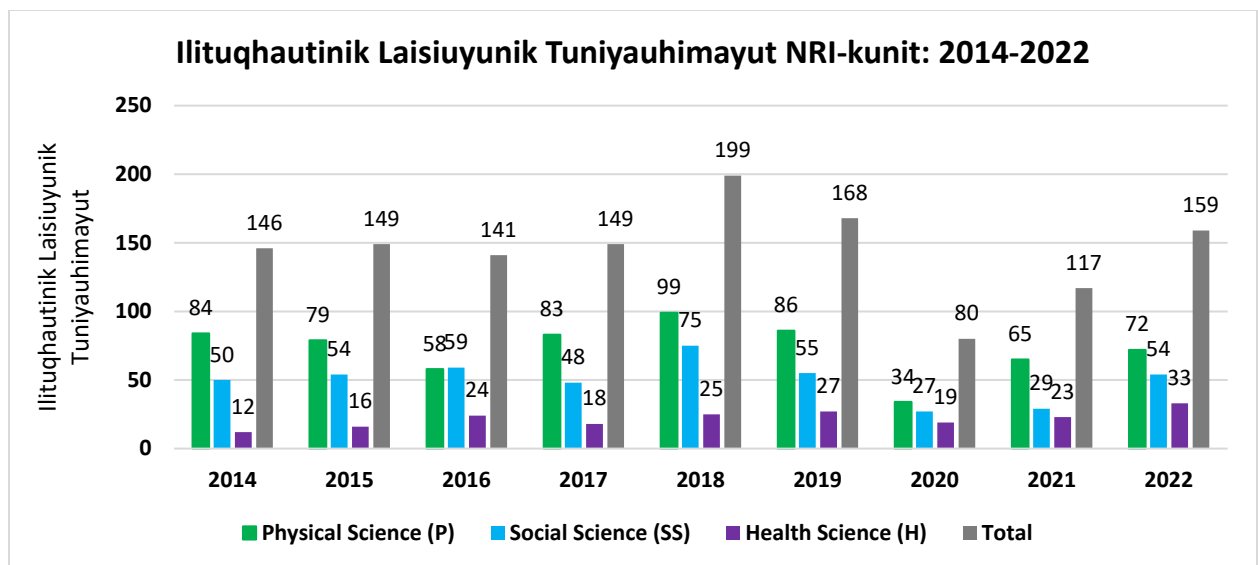
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Science Advisor for Nunavut
Nunavut Research Institute
Nunavut Arctic College
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Tuhaqtijut Nunavumi Naunaiyautinik Ihumakhaqhiuqtimit

Quviahuktuga uqauhiriyaagani inuujuhiqmit ilituqhautivut havaat laisiqaqtut ilagani Nunavumi *Nunaiyaiyit Maligaqyuagani* 2022-mi. Naunaiyaiyit Maligaqyuagat atuqtuq tamaini ukiuqtaqtumi Nunavumi piquiyuqlu kinaliqaa ilituqhainahuaq havauhiuyuni aaniaqtailijutinik, inuuhiqmik naunaiyautinik, nunamit/takunaqtuniklu naunaiyautinik hivuliqmi piyariaqaqtut laisiuyumik Nunavumi Ukiuqtaqtumi Ilihaqpaalivikmit (NAC). NAC-kuni, tuiqhimagugut Nunavumiut qauyimainariagani ilituqhautinik atuqtauyunik ukiuqtaqtuutiptikni nunami, uqalaaqhutiklu qanuritunik ilituqhautinik havaariyauyunik qanuqlu ilituqhaut havaariyauniaqnganik. Akhuuqhaqtagit uqaqatigiyaagani iliknik ukua ilituqhautinik laisiuyunik tigumiaqtit kituniliqaa havaariyauyunik uqautauyunik aaliuyumi ilitpaaliriaqni havaariyainik.

NAC-kut tuihihimayut 159-nik ilituqhautinik laisiuyunik 2022-mi, 26%-guyuq amigaitqiyainik laisiuyunik tuiyauyunik uvanga 2021-mit (117), agitqiyainiklu amigainiginik qafiuqunigik laisiuyut (158) tuiyauhimayut ukiuni hivuani QALAKYUAQNIQ-19-mit qalakyuaqniqmit (Naunaipkut 1). Qilamik amigaiqpalianiga ilituqhautinik hulijutit humiliqaa tamaini havauhiqni Nunavumi 2020-mit atuqtiligu igataumaniga qalakyuaqniup 2022-mi QALAKYUAQNIQ-19-mit atuguyaugitut tamaita aturuiqmata Ukiuqtaqtuutivut naamainaqtuuyaaqtuq. Una amigaiqnigit naunaiyautini hulijutimi pijutauyuq amihunik atuqtakhainik Nunavumiut, kihiani hatqirutauyuq ilagininik akhuurutikhaniklu.

159-nit laisiuyunit tuiyauhimayunik 2022-mi, 54-guyut inuuhiqmik naunaiyautit ilituqhautit, 72-guyut takuukhauyunik/ manikamilu naunaiyautit, 33-guyulu tuiyauhimayut Aaniaqtailinikut ilituqhautinik.



Titiiqqat 1: Qafiunigit ilituqhautinik laisiuyut tuniyauhimayut NRI-kunit 2014-mit 2022-mut takuukhauyunik naunaiyautinik, inuuhiqmik naunaiyautinik aaniaqtailinikulu ilituqhautinik havaanik.

Quyagiyatka amigaitut ilituqhaiyit hivuliqhuqtit ayugitulu humiliqaa Nunavumi nunagiyauyuni. NAC-kut tuniqhimayut agikliliriagani ilituqhainikut ayuruirutit Nunavumi ilaqaqtunik agiklipkariagani atuqtakhainik Nunavumiut ilauyaagani ukunani, ilitaagani ukunanga, atuqluaqtuqlu, hivuliqhuriagani tikuutilugilu naunaiyautit ihuaqhautauyut ihariagiyainik nunagiyapta inugiyainit. Ilituqhautit ukiuqtaqtuuptikni aulariktuqhauyut, ajikiiklutik, atuqhimaqlutiklu Nunavumiut inmik ihuaqtumiklu ilaukpata, ikayuutigiyailu ihumagiyautiaqata ilitariyaukpatalu humiliqaa tamaini havauhiuyuni ilituqhautimi pijutauyunik.

Quyagiluaqtavulu amigaitut inuit timiuyulu humiliqaa Nunavumi ilauhimayut NRI-kut ilituqhautinik laisigiyainik ihivriurutainik havauhiqmi ikayuqtulu uvaptiknik piqariagani aginiqhanik ihuaqniqhanik atuqtakhanik ilituqhautini ukiuqtaqtumi nunami. Huli taitai ilitarilagamayatka amigaitut Nunavumiut ihuaqhaiyut hivuliqhuqtulu nanminik ilituqhautikhamiknik havaanik, pipkaiyulu kagiqhijutikhanik, nuuptirutinik, piqutiqaqtitiyut, tikuutiuyut, naunaipkutinik katitiriyut, ahiiniklu atuqniqaqtunik ayugitunit piqariagani aaniqnaitumik aulaniqatiaqtuniklu ilituqhautinik 2022-mi.

Iitpaalirumaguvit qanuq ilauvaaliriaqni ilituqhautinik havaami, ihumalutiqaruviluniit ilituqhautinik havaaq aanirutaulaaqniqanik ihuilijutauniaqniqanikluniit nunagiyaqni avatauyumiluniit, qanurunaaqtailutit uqaqvigiyaagani titiraqvigiyaqut.

Hivuniqhivaalirumaguvit NRI-mik havaariyaptikniklu ikayuuptikniklu, takunahuajavat qaritauyami qungialiugaqut uvani www.NRI.nu.ca -miituuq.

Jamal Shirley
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Health Research

Burden Ethnographic Modeling Evaluation Qaujilisaaqtuq (BEMEQ) RSV: The Nunavut and Nunavik burden study

License Number: 01 007 22R-M

Principal Investigator: Goldfarb, David

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Number in Party: 4

Research Locations: Iqaluit

SUMMARY

A very high proportion of babies in Nunavut are admitted to hospitals with respiratory infections in their first year of life. Respiratory Syncytial Virus (RSV) is a common cause of these admissions, but many are caused by other viruses. Babies admitted to hospital with these respiratory infections often require transport out of territory and intensive care. However, current estimates of this burden of illness are limited in the type and scope of the information collected. Accurate understanding of the causes and burden of respiratory tract infection in babies in Nunavut is needed to better address this health challenge, which is considered high priority by those involved in child health in the territory. We propose to identify the respiratory infection admissions at all hospitals serving Nunavummiut children under one year of age from 2010-2020.

Implementation of a maternal pertussis immunization program: Improving coverage among Inuit women

License Number: 01 009 22R-M

Principal Investigator: Halperin, Donna

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Number in Party: 16

Research Locations: Arviat, Iqaluit

SUMMARY

We are conducting a three-year study during which time we aim to determine the knowledge, attitudes, beliefs, values and behaviours of community Elders, healthcare providers, and pregnant women about maternal immunization. We hope to explore the usefulness of the Tdap and influenza vaccine programs, and to look at what barriers, facilitators, and factors influence a woman's decision to be vaccinated. This will be achieved through a research approach that includes individual narrative collection with community experts, sharing circles with pregnant women and healthcare providers, and surveys of pregnant women. Researchers from the Canadian Center for Vaccinology have been working in close partnership with our Northern community counterparts, and other key stakeholders throughout the development of this research project, using Indigenous and more specifically Inuit frameworks of thought to guide the process.

Focused community TB screening among high-risk residential zones in Nunavut: The TAIMA TB household risk prediction study

License Number: 01 037 22Registry

Principal Investigator: Alvarez, Gonzalo

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Number in Party: 12

Research Locations: Ottawa

SUMMARY

This project aims to identify residential zones (areas of one or more households) that are at a high risk of developing active TB. The ability to identify high risk zones will mean that the labour-intensive community-wide screening can focus on these zones. The study will derive and validate the TAIMA TB household risk score. The Inuit-specific risk score will use as variables information about social determinants of health and geospatial information specific to Inuit households in Nunavut. Nunavut has an incidence rate of TB among Inuit living in Inuit Nunangat of 206/100,000 compared to 0.5/100,000 among non-Indigenous Canadians. An Inuit-led task force aims to eliminate TB using Inuit-specific and novel approaches. Community-wide screening (CWS) has been shown to work but with the increasing number of cases, resources to accomplish CWS are stretched (everyone is screened) and there is no standardized method for identifying who should be screened.

Should newborn screening be initiated in Nunavut for Mild CPT1 (Carnitine Palmitoyl Transferase -1) deficiency?

License Number: 05 005 22R-M

Principal Investigator: Arbour, Laura

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Number in Party: 3

Research Locations:

SUMMARY

CPT1 deficiency is caused by a genetic change (mutation) in the Carnitine Palmitoyl Transferase-1 gene. This gene normally produces a protein that is involved in producing energy from the fats we eat. We all have two copies of this gene (all of our genes come in pairs) as we inherited one copy from our mother and one copy from our father. People who have a mutation in both copies of their CPT1 gene produce a protein that does not work properly. These individuals have trouble producing energy from fats. The mutations do not usually affect people in day to day life, because we get most of the energy we need by breaking down sugars from our food rather than fats. However, when we get sick or are not eating enough food for other reasons our bodies start to break down our fat stores for energy. Thus, individuals (particularly infants) who have CPT1 mutations in both copies of the gene can run into health problems during periods of illness or fasting because they cannot produce enough energy from fats.

Understanding the role of the CPT1A P479L variant in infant and child health outcomes in Nunavut

License Number: 05 006 22R-M

Principal Investigator: Arbour, Laura

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Number in Party: 4

Research Locations:

SUMMARY

CPT1A (carnitine palmitoyltransferase 1A) is a liver protein that uses fat for energy when sugar is not available (during fasting or prolonged exercise). Classical CPT1A deficiency is caused by a genetic change (mutation) in the CPT1A gene causing the protein to not work properly. Although this usually does not cause problems since most energy comes from sugars, people with these mutations (especially infants) can have problems during illness or fasting, resulting in low blood sugar, seizures and even unexpected sudden infant death. Treatment involves frequent feeding in the first years of life and medical aid if the child becomes ill. Early diagnosis and education save lives.

Gathering community perspectives on infant sleeping practices in Nunavut

License Number: 05 007 22R-M

Principal Investigator: Arbour, Laura

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Number in Party: 4

Research Locations:

SUMMARY

Nunavut has the highest rate of infant deaths (deaths until 1 year of age) in Canada. One important cause of infant death in Nunavut is sudden infant death syndrome (SIDS), where an infant dies during sleep without an obvious cause. When this occurs, it is devastating for families. Safe sleeping practices with a newborn infant are very important and may reduce the chance of SIDS. Sleeping practices that can make a difference include the position the baby is put to sleep in and other aspects such as sleep surfaces, other people in the same bed as the baby, etc. In partnership with Nunavut Tunngavik Inc (NTI) and the Qaujigiartiit Health Research Centre, this project will hold multigenerational focus groups to explore traditional and current sleep practices (positioning, co-sleeping, etc.) Information from the focus groups and knowledge of Inuit cultural practices will help in development of a health promotion strategy encouraging safe sleep practices and culturally-relevant Maternal Child Health practices.

Making SPARX fly in Nunavut

License Number: 05 004 22R-M

Principal Investigator: Bohr, Yvonne

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Number in Party: 19

Research Locations: All Communities

SUMMARY

Launched in April 2017 and now in its (extended) fifth year, I-SPARX is a project funded by the Canadian Institutes of Health Research that aims to build on the collaborative work of our pilot SPARX study by evaluating a holistic, multi-generational activity that addresses several specific issues understood to be core factors in the mental health of Inuit youth: 1) emotion regulation 2) hopelessness 3) normalization of self-harm as an option for problem-solving; and 4) need for a repertoire of culturally-valid, constructive cognitive strategies for problem-solving (CBT). The I-SPARX initiative revolves around the youth-driven design of an ER/CBT-based Inuit version of SPARX (I-SPARX), a computer-based, interactive educational game. I-SPARX is a resource designed to teach CBT skills to youth. The I-SPARX Project is guided by a Community Participatory Spectrum of Prevention approach, principles of Inuit Qaujimajatuqangit, and the Two-Eyed Seeing research methodology in consultation with community Elders.

Inuit youth and families during COVID-19: A strengths-based focus on resources needed to optimize post-pandemic resilience

License Number: 05 016 22N-M

Principal Investigator: Bohr, Yvonne

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Number in Party: 11

Research Locations: All Communities

SUMMARY

- 1) Add to our limited understanding of the psychosocial impact of the COVID-19 pandemic in the territory by recruiting youth, Elders, and other community participants and facilitators from across Nunavut;
- 2) Design, together with community members including youth and Elders, a methodology intended for the identification of an exhaustive list of cultural and community aspects of connection believed to contribute to resilience;
- 3) Investigate, together with youth and other community members, additional and alternative ways of creating connection in a technological age, specifically when temporary social isolation has been mandated;
- 4) Identify, together with youth and community members, existing as well as wished-for social structures and systems that may further support connection and resilience during a pandemic; and
- 5) Contextualize the findings in a culturally-embedded philosophical framework—Inuit Qaujimagatuqangit (IQ)—to allow for a more nuanced understanding of resilience.

Inuit youth develop a virtual qaggig: Using technology and cultural knowledge to support resilience outside the (digital) box

License Number: 05 017 22N-M

Principal Investigator: Bohr, Yvonne

Affiliation: Faculty of Health
York University
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Number in Party: 11

Research Locations: All Communities

SUMMARY

- 1) Identify specific factors that youth leaders (YLS) believe most contribute to their and their peers' mental health challenges;
- 2) Together with YLS, select an array of culture- and evidence-informed adaptive strategies that can be incorporated into accessible digital tools to address those challenges;
- 3) Design digital mental wellness tools based on the selected strategies, incorporating them into an interactive virtual meeting space, the Virtual Qaggig;
- 4) Rigorously test those e-tools and the Virtual Qaggig format with community members and youth across Nunavut; and
- 5) Determine whether outcomes are more favourable for participants who engaged in a pre-set suite of tools or for participants who could select their own preferred e-tools.

Using community-driven research to develop programs that prevent and reduce harmful substance use among youth in the Hamlet of Pangnirtung

License Number: 02 043 22N-M

Principal Investigator: Cassie, Rachel

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Number in Party: 4

Research Locations: Pangnirtung

SUMMARY

This research will explore: 1) how to ensure there is total community control and decision-making power throughout the research process, and 2) how to conduct research on sensitive topics that may be traumatizing, especially with youth. This research project is important to ensure future research with Pangnirtung is community-led and minimizes all potential harms. Future research is needed to address the harms of colonization, but exploration of how to do this research is an important first step. While similar research has been conducted in other communities, Pangnirtung-specific research is important to rebuild the community's trust with the research world and to ensure these practices and policies meet Pangnirtung's specific needs.

Niqivut Silalu Asijjipalliajuq (NSAP): Our food and climate change

License Number: 01 020 22R-M

Principal Investigator: Caughey, Amy

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Number in Party: 15

Research Locations: Kinngait, Clyde River, Pangnirtung, Iqaluit, Rankin Inlet

SUMMARY

The project aims to share stories of country food preparation methods and country food use for health and medicine. The program will prioritize Inuit knowledge to support food security and food sovereignty in a changing climate. This project plans to invite community knowledge holders to share stories of using all parts of the animal, country food as medicine, and preparing country food safely. These findings will be shared through audio, visual, and written ways within Nunavut to support country food as a foundational food for Nunavummiut.

Supporting Inuit family healing following traumatic disclosures of non-offending caregivers: A mixed-method pilot project with the Arctic Children and Youth Foundation

License Number: 01 024 22N-A

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Number in Party: 4

Research Locations: Iqaluit

SUMMARY

Since the opening of the Umingmak Centre in 2019, Nunavut's first child advocacy centre, there has been an increase in disclosures of child/adolescent maltreatment. Existing in a relational context, abuse and the potential subsequent disclosure is informed and shaped by family relationships. Research highlights that the presence of a supportive non-offending caregiver during a process of disclosure acts as essential in influencing a child/adolescent's willingness to disclose and their ability to cope in the aftermath of trauma (Brown, Cohen & Mannarino, 2020). This revelation of abuse can be greatly distressing for a caregiver, especially if the abuse occurs within the family or reflects the caregiver's own trauma (Holm & Hansen, 2004). In Nunavut, colonial realities of intergenerational trauma increase the likelihood and vulnerability of caregivers contending with their own past traumatic experiences while seeking to support their children (Crawford, 2014). Recognizing how caregiver involvement acts as a central tenant to a child/adolescent's overall recovery, the Umingmak Centre, in partnership with the University of Toronto, seeks to investigate the needs of non-offending caregivers to inform the creation of wrap-around pathways supporting local families.

Advancing accessibility using Inuit Qaujimajatuqangit

License Number: 05 008 22N-M

Principal Investigator: Diakite, Nicole

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Number in Party: 9

Research Locations: All Communities

SUMMARY

Engage community members on experiences of disability and provide an opportunity to be heard. Create knowledge mobilization products that help inform disability services, programs, funding, government policies, and accessibility standards for Nunavut. We hope to offer a better understanding of accessibility standards in Nunavut and how those standards interact with Inuit Qaujimajatuqangit (IQ values).

Program review for development of a northern plastic surgery clinic

License Number: 03 002 22Registry

Principal Investigator: Fialkov, Jeff

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Number in Party: 3

Research Locations: Rankin Inlet

SUMMARY

The study objectives include a comparative analysis of wait-times, cost, and quality of care associated with this initiative. These aspects will be compared to the standard provision of treatment which involves transportation to a larger out-of-territory surgical centre. This study is needed to ensure that the annual KHC plastic surgery clinic is improving access to plastic surgery care for the residents of the Kivalliq region, reducing the costs associated with treatment, and providing patient-centred and culturally-sensitive care for this population.

Cannabis in our communities: A focus on Inuit youth and maternal health and well-being

License Number: 05 013 22N-A

Principal Investigator: Giesel, Chelsea

Affiliation: Pauktuutit Inuit Women of Canada
Ottawa, Ontario, Canada

Number in Party: 3

Research Locations: All Communities

SUMMARY

The overall objective of this project is to assess knowledge, attitudes, and behaviours in Inuit communities and raise awareness of the effects and potential impacts of cannabis using a trauma-informed, culturally-relevant, gender-informed harm reduction approach. This is the first national, Inuit-led project of its kind reaching Inuit from all four land claim regions and select urban centres. We hope to assess the appropriateness of awareness campaigns, community actions, preventive programs and health services related to cannabis use in Inuit communities.

An interrogation of the housing crisis in Nunatsiavut and Nunavut: Outcomes for women, children and families

License Number: 01 026 22N-M

Principal Investigator: Goldhar, Christina

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Number in Party: 2

Research Locations: Iqaluit

SUMMARY

This study is an investigation of the northern ‘housing crisis’ in eastern Inuit Nunangat – Nunatsiavut and Nunavut. It seeks to interrogate the governance and public policy approaches to housing that arguably created and continue to perpetuate the northern housing crisis, paying close attention to outcomes for women, children, and families. It examines the relationship between housing insecurity and welfare, by exploring connections between housing need, social service provision, and the child welfare system. This project asks: i) What are the connections between the current housing crisis and the welfare of women, children and families in Nunavut and Nunatsiavut; ii) How do social policies and governance structures create, perpetuate and address the housing crisis for women, children and families in Nunatsiavut and Nunavut; and iii) What successes and opportunities exist in the governance of northern housing, housing insecurity, and related services that will better support the welfare needs of women, children and families in the context of the housing crisis in Nunatsiavut and Nunavut.

Suicide prevention strategies in Inuit Nunangat: The role of Inuit-led cultural programming

License Number: 02 052 22N-M

Principal Investigator: Hamilton, Chloë

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Number in Party: 2

Research Locations: Arctic Bay, Rankin Inlet

SUMMARY

This research project focuses on ongoing Inuit-centred cultural program initiatives in Inuit Nunangat that deal with healing, wellness, and suicide prevention. In partnership with the Arctic Rose Foundation, this research aims to build an understanding of the role of Inuit/Indigenous-led youth cultural programs in improving mental health.

Evaluating the impact of cannabis legalization in the Canadian territories

License Number: 05 001 22R-M

Principal Investigator: Hobin, Erin

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Number in Party: 4

Research Locations: All Nunavut Communities

SUMMARY

This research will provide decisionmakers in northern Canada with ongoing feedback in the early stages of cannabis legalization, and evidence on the longer-term public health effects. The study has five objectives:

1. To examine prevalence and patterns of non-medical cannabis use, including use among young adults, age of initiation, and levels of dependence;
2. To examine the cannabis retail environment, including illicit versus legal sources, and the products used;
3. To assess changes in problematic use and risk behaviours, including driving after cannabis use, use in high risk occupational settings, and co-use with other substances;
4. To examine changes in perceptions of risk and social norms; and
5. To evaluate the effectiveness of specific regulatory policies, including marketing and education campaigns, and use in public and workplaces.

Improving families' and service providers' experiences at the Aakuluk Children's Clinic: An evaluation study

License Number: 01 006 22M

Principal Investigator: Jetty, Radha

Affiliation: Children's Hospital of Eastern Ontario
Ottawa, Ontario, Canada
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Number in Party: 9

Research Locations: Iqaluit/Ottawa

SUMMARY

Our research team is conducting this study to understand what is working well in the Aakuluk Clinic and what changes can be made to improve the services and care provided to families. We will conduct interviews with parents to ask them about their experience and where they might have challenges in the clinic. We are hoping to hear the stories of many Nunavut families, to learn about how the Aakuluk Clinic can serve Nunavut families in the best possible way. We will also interview different care providers at the Aakuluk Clinic to better understand their experience and identify opportunities for improvement.

Prevalence and severity of complicated diverticulitis among a Canadian Arctic population

License Number: 01 002 22-Amended

Principal Investigator: MacDonald, Blair

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Number in Party: 3

Research Locations: Ottawa (remote research)

SUMMARY

Diverticular disease is one of the most frequent bowel emergencies presenting with an acute abdomen. Patients from northern populations are deemed to be at high risk for developing unusual severe diverticulitis. Diverticulitis in this population occurs at a younger age with more complications and more morbidity. The research team will retrospectively review the CT reports of all adult patients (at and/or above 18 years) presented to Qikiqtani General Hospital (Nunavut) and who had CT abdominal with and without IV contrast from January 1, 2014 to December 31, 2019.

Understanding cultural TB stigma from Inuit perspectives: Implications for culturally-safe public health TB policy and practice

License Number: 01 030 22N-A

Principal Investigator: McKee, Donna Beverly

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Number in Party: 4

Research Locations: Kinngait, Qikiqtarjuaq, Whale Cove

SUMMARY

Inuit in Canada have an average rate of active TB that is 300 times greater (170.1 cases per 100,000) than all other Canadian-born Canadians (Patterson et al., 2018; Stats Can 2018). Non-Indigenous Canadian-born Canadians have an incidence rate of active TB that is 0.5 per 100,000 (Kilabuk et al., 2018) and in comparison, active TB rates among First Nations peoples on reservations is 40 times higher than non-Indigenous Canadians born in Canada (Stats Can 2018). The prevalence of TB is related to a history of colonialism and current health care inequities. The Government of Nunavut in response to such alarming incidence rates initiated community-wide TB screening clinics in three remote communities with the intention of carrying out clinics across Nunavut. However, post evaluation of the first of the three community-wide TB screening clinics identified community responses of exclusion and alienation, loss of control over own TB health treatments, and feelings of community disruptions. These findings suggest that Inuit may be experiencing further marginalization as a result of cultural TB associated with a lack of Inuit inclusion in public health policy development and programming. Gaining an in-depth understanding of Inuit perspectives related to what promotes cultural safety in public health TB policies and programs is needed to mitigate historical health inequities of Inuit in Canada.

Patient and family perspectives on operationalized assent in Canadian pediatric intensive care research: A survey and interview study

License Number: 01 034 22N-M

Principal Investigator: O'Hearn, Katie

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Number in Party: 13

Research Locations: Ottawa

SUMMARY

Our ultimate goal is to develop a clear, standardized process for obtaining assent in PICU research. However, we must first understand how PICU patients and their families want children to be included in the decision about joining a research study. The objective of this project is to explore patient and caregiver perspectives on assent for PICU research using surveys and interviews. We will recruit patients and their families from the PICU at four children's hospitals in Alberta, Ontario, and Quebec. We will do interviews with patients (ages 5 to 17) and their primary caregiver(s). Surveys will be completed on paper or online, and interviews will be conducted in person for patients in hospital and remotely for those discharged. We expect to gather data for approximately 9 months, and that this project will take 2 years. All data gathered will be de-identified (made anonymous), and stored securely at CHEO in Ottawa, Ontario until its destruction.

Unintended outcomes of the public health measures associated with the COVID-19 pandemic in Nunavut: Public health learnings

License Number: 05 009 22Registry

Principal Investigator: Rana, Zoha

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Number in Party: 2

Research Locations: All Communities

SUMMARY

The goal of this project is to implement an ecological mixed methods study using primary and secondary data to develop an understanding of both the positive and negative societal outcomes that are a result of the public health measures associated with the COVID-19 pandemic in Nunavut. Primary data analysis involved a researcher using information that they have collected through their own efforts. Secondary data analysis involves a researcher using the information that someone else has gathered for his or her own purposes or that which is collected for surveillance purposes.

The impact of culture and prejudice on the recognition of facial expression of emotions/pain and on perceptual processing

License Number: 01 039 22N-M

Principal Investigator: Samson, Danielle

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Number in Party: 4

Research Locations: Iqaluit, Kimmirut, Cambridge Bay, Rankin Inlet

SUMMARY

The main objective of the proposed research project is to address a potential gap in care and improve cross-cultural interactions by testing the hypothesis that facial expressivity varies as a function of culture, and that exposure to varying degrees of expressivity in turn impact perception of facial expressions. Our goal is to promote better assessment of pain intensity and other emotions to facilitate social interactions and improve health care for everyone. This data could promote dialogue between Inuit and non-Inuit populations. In short, the idea is to push the boundaries of knowledge about how culture influences facial expressivity and the perception of facial expression of emotions.

Continued surveillance for Antimicrobial Resistance (AMR) in *Neisseria gonorrhoeae* (GC) and prevalence of *Mycoplasma genitalium* (MG) and MG AMR in gonorrhea positive specimens from Nunavut

License Number: 05 011 22R-M

Principal Investigator: Singh, Ameeta

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Number in Party: 4

Research Locations: Winnipeg

SUMMARY

Gonorrhea is the second most commonly reported sexually transmitted infection in Canada. The highest rates of infection in Canada are in the territory of Nunavut. The bacterium has developed resistance to all antibiotics used to treat it since the 1940s and so it is important to check which antibiotics will work to treat the infection in any given area of the world. The treatment for gonorrhea is usually based on further testing done after growing the organism in the laboratory. It is not possible to grow the organism from specimens collected in remote areas such as Nunavut as the long delays in transportation of the specimens result in the death of the organism. This poses unique challenges as this means that other methods are needed to see if the organism is resistant to the antibiotics that would be used. The National Microbiology Laboratory (NML) in Winnipeg has developed tests which can test for genes which predict for antibiotic resistance and have offered this service to remote parts of Canada. In addition, the same specimens will be tested for the presence of a new sexually transmitted infection: *Mycoplasma genitalium* (MG). This bacteria has been found in specimens collected in other parts of Canada. If the bacteria is found in the specimen, it will also be tested to see which antibiotics would work best to treat it.

Understanding the effects of the pandemic on Indigenous peoples in Nunavut communities

License Number: 03 017 22Registry

Principal Investigator: Tagalik, Shirley

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Number in Party: 3

Research Locations: Cambridge Bay, Kugaaruk, Iqaluit, Pangnirtung, Rankin Inlet

SUMMARY

Starting in March 2020, Nunavut put in place a number of measures to prevent the virus from spreading, including travel bans and closing schools and businesses. Although some of these measures have been relaxed over time, we do not know what the long-term effects of these measures have had on the lives of people living in Nunavut communities and all aspects of health and wellness in the communities. The many mental health impacts of the pandemic restrictions in particular are important to understand from the perspectives of community members. We also plan to ask for recommendations and suggestions for how to support mental health in this highly stressful situation. It is also important to capture cultural considerations related to the spread of COVID-19 so that this information can be used to prevent the spread of future viruses in Nunavut communities. For these reasons, using Indigenous methods to understand the impacts of the pandemic as well as the measures to prevent the virus from spreading amongst Nunavut communities, is crucial.

Welcoming the Sacred Spirit (child): Connecting Indigenous and Western ways of knowing to inform future policy partnerships to optimize maternal child health service delivery initiatives in remote Canadian regions

License Number: 01 008 22R-M

Principal Investigator: Thiessen, Kellie

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Number in Party: 2

Research Locations: Iqaluit, Rankin Inlet

SUMMARY

This research study is being conducted to study how maternity care programs and policies affect life-giving processes for individuals and communities in Northern Canadian regions. Firstly, we will study which maternity service delivery models are the best at supporting people to maintain health and wellness in their community, and which ones are cost-efficient and culturally appropriate. In order to study this, we are conducting interviews and focus groups (sharing circles) with people involved in maternity care. We will also describe the effects of maternity programs and policies on people's health and experiences, and the accessibility of maternity programs. We will focus on Indigenous people's physical, social, emotional, and spiritual well-being. Secondly, we will identify how healthcare providers define maternal health and wellness, and compare this to how Indigenous communities define maternal health and wellness.

Foodbook 2.0: Canadian food consumption study to support foodborne disease surveillance and outbreak response

License Number: 05 014 22N-M

Principal Investigator: Tooby, Megan

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Number in Party: 9

Research Locations: All Nunavut Communities

SUMMARY

The primary objective of the Foodbook 2.0 study is to develop population-level estimates of risk factors for enteric illnesses. These risk factors include food exposures (e.g., fruits, vegetables, meats, herbs, nuts and seeds, eggs, dairy products), water exposures, and animal exposures. In addition, data will be collected about consumer food safety practices and food purchasing habits. These data will be used to inform outbreak response, public health surveillance and epidemiological studies. The study will also collect information on the incidence of acute gastroenteritis in the general population and their health care-seeking behaviours. Finally, willing participants may opt to be included in the Enteric Control Bank (ECB). The ECB is a contact list of individuals who are willing to participate in future enteric disease outbreak investigations and Canadian enteric disease and public health research conducted by the Centre for Foodborne, Environmental and Zoonotic Infectious Diseases (CFEZID).

Modelling the impact and cost-effectiveness of novel approaches for TB control in Nunavut

License Number: 05 003 22R-M

Principal Investigator: Zwerling, Alice

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Number in Party: 3

Research Locations: Ottawa

SUMMARY

The goal of this study is to create computer-based models to help predict the impact and cost-effectiveness of new tuberculosis (TB) screening programs to actively find persons at risk of developing TB throughout Nunavut. This study will provide Nunavut-specific information for local decision makers to better understand how TB programs can be changed to improve the health of communities while spending the least amount of money (i.e., cost-effective manner).

Primary Ciliary Dyskinesia (PCD) in Canada's Inuit community – Report of a novel mutation

License Number: 01 004 22N-M

Principal Investigator: Kovesi, Tom

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Number in Party: 11

Research Locations:

SUMMARY

The goals of the study are to inform physicians treating Inuit that PCD may be a cause of bronchiectasis, chronic sinusitis, and/or recurrent otitis media in this population, and what gene mutation should be searched for when PCD is suspected. This information may ultimately also be used to expand the Nunavut Newborn Screening Program.

Social Sciences Research

Monitoring the health of Simirlik National Park through Inuit Knowledge: Pilot project

License Number: 02 003 22R-M

Principal Investigator: Mahy, Maryse

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Number in Party: 4

Research Locations: Pond Inlet, Arctic Bay

SUMMARY

The overall goal of the project is to include Inuit Knowledge in Parks Canada's assessment of the health of the park's ecosystems. The immediate objective of the project is to test a method for monitoring/studying the health of the Park's ecosystems/environment through Inuit Knowledge in the long term.

Ulinairsijit: A SciQ approach to evaluating research in Inuit Nunangat

License Number: 02 044 22N-M

Principal Investigator: Brunet, Nicolas

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Number in Party: 4

Research Locations: Pond Inlet

SUMMARY

Working closely with the organisation Ikaarvik, with whom the lead researcher has been working with for almost 5 years and co-applied for these funds, this project aims to implement a youth-led community-based research evaluation program. We are also working closely with government colleagues and NRI in making sure our approach can be integrated into research management processes in Nunavut.

Governance options for low impact shipping corridors

License Number: 01 010 22R-M

Principal Investigator: Carter, Natalie

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Number in Party: 2

Research Locations: Arviat, Cambridge Bay, Iqaluit, Rankin Inlet

SUMMARY

Over the past four years, the Arctic Corridors and Northern Voices (ACNV) project has focused on identifying local concerns with Arctic shipping increases and in identifying geographic areas of concern. We have completed this work in 7 Nunavut communities. One of our findings was the need to further examine governance and policy strategies that respond to the concerns about shipping. To achieve our project objectives (i.e., examine governance options for low impact shipping corridors that respond directly to the local concerns about increases in shipping) we will use a policy Delphi method that involves three questionnaires - each one building on the one before it. The purpose of this research is to (1) identify potential strategies for Inuit and Northern involvement in Low Impact Shipping Corridors governance, and (2) evaluate those potential strategies.

The geopolitical stakes of Nunavut's digital development

License Number: 01 027 22 N-A

Principal Investigator: Celestine, Rabouam

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Number in Party: 3

Research Locations: Iqaluit

SUMMARY

The field study in Iqaluit, part of a geopolitical thesis about the digital development of the Nord-America Arctic, aims to collect qualitative data by doing semi-directive conversations of stakeholders involved in telecommunications projects in order to learn from them on the dynamics of digital spatialization of the territory. It will help validate, or not, the hypothesis that there is geopolitical growing interest from private actors for digital projects in the Arctic. This work will also allow me to verify whether the strategies deployed by these actors are beneficial for the populations, in terms of data protection, for example.

Assessing the change in coastal ecosystem biodiversity over time and space through local knowledge

License Number: 01 003 22R-M

Principal Investigator: Christie, Laurissa

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Number in Party: 7

Research Locations: Kinngait, Igloolik

SUMMARY

Climate change is altering habitats, fish distributions, and ecosystems in the Canadian Arctic. Of particular relevance are changes affecting coastal ecosystems; areas preferentially used by Indigenous Peoples for subsistence. The goal of this research is to document biodiversity and environmental conditions of coastal ecosystems in the Hudson Bay Complex and understand how those have changed over time. To this end, local community-led coastal scientific research was initiated in January 2020 in Kinngait and Igloolik. Our objective here is to collaborate with the two communities to document local knowledge regarding biodiversity and environmental conditions near Kinngait and Igloolik and build upon the ongoing community-led research. Together, this knowledge will provide a broader understanding of the coastal ecosystem and will help to monitor rapid coastal change and assist the communities in preparing for a future Arctic.

Participatory assessment of Aklak (grizzly bear) abundance and distribution in the Kivalliq Region

License Number: 03 002 22R-M

Principal Investigator: Clark, Douglas

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Number in Party: 3

Research Locations: Arviat, Baker Lake, Rankin Inlet

SUMMARY

The objective of this project is to estimate Aklak abundance and distribution in the Kivalliq region by combining Inuit Qaujimagatuqangit about Aklak with scientific data already collected by the Government of Nunavut.

On the syntactic status of person and number markers in Inuktitut

License Number: 01 016 22R-M

Principal Investigator: Compton, Richard

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Number in Party: 4

Research Locations: Iqaluit

SUMMARY

The goal of this research is to better understand the structure of Inuktitut; how words and sentences are formed, which properties differentiate Inuktitut from other languages, and which properties it shares with other languages. The larger goal of linguistic research is to expand our knowledge of human language.

Mixed method traditional knowledge study of coastal factor correlation to declining sea ice in Resolute, Nunavut

License Number: 02 051 22N-M

Principal Investigator: Forsythe, Alexandra

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Number in Party: 2

Research Locations: Resolute Bay

SUMMARY

Global climate change causes sea ice decline in Canadian Arctic Inuit communities, who use sea ice extensively in lifestyle supporting activities, such as hunting and travel. Arctic-wide and global-scale studies can predict how sea ice will continue to decrease with climate change scenario projections. However, due to a lack of recorded data and the remote nature of Arctic communities, sea ice and coastal behavior at a community scale are far less understood. Despite a lack of scientific understanding, the Inuit inhabitants hold a wealth of traditional knowledge on local coastal and ice environments. This study aims to use scientific techniques paired with traditional knowledge to answer the research question, “Can coastal factors be correlated to the development of dangerous ice conditions in Resolute Bay, Nunavut?” Researchers will visit Resolute Bay to conduct a traditional knowledge study that contains three parts (1) a 1-hour group discussion session using maps to record knowledge of coastal and sea ice behavior, (2) a 15-minute written survey about the changing coastal and sea ice environment over time and (3) a 30-minute individual semi-structured interview documenting personal experience with the coastal environment and any extreme events. The traditional knowledge study will take place in the summer of 2023, over a four-day period in the community center. Participants will only be expected to participate for a total time of 2 hours.

Silalirijiit Project

License Number: 02 015 22R-M

Principal Investigator: Fox, Shari

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Number in Party: 5

Research Locations: Clyde River

SUMMARY

The Silalirijiit Project has been running in Clyde River since 2009. It builds on previous research and collaboration to gain a better understanding of weather patterns and weather information needs for the community and provide improved weather information. The project runs a small weather station network, with information available to the public. The project also supports a hunter apprenticeship program, where experienced hunters take youth on the land with a focus on learning weather-related knowledge and safe travel and hunting skills. Inuit knowledge about weather and the environment is documented through the apprenticeship program and helps to link Inuit knowledge and visiting science about local and regional weather patterns

The lived experience of kadloona in Nunavut

License Number: 02 047 22N-M

Principal Investigator: Garrett, George

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Number in Party: 2

Research Locations: Arctic Bay, Clyde River, Igloolik, Sanirajak, Kinngait,
Pangnirtung, Pond Inlet

SUMMARY

The aim of the present study is to fill the research gap by explicating the holistic lived experience of kadloona teachers living in the Arctic. This focus will benefit the research field in the Arctic by informing induction programs, giving teachers, and other professionals, an idea of what to expect in the Arctic. In addition, this research can contribute to the qualitative literature on emotions in the anthropological field, culture shock, and personal development in the context of a different culture/place. The study will prepare counsellors and psychotherapists to work with those that have had similar struggles and opportunities.

Socio-environmental determinants of grocery sales and community nutrition in transition in Nunavut, Canada

License Number: 01 038 22Registry

Principal Investigator: Gilbert, Sappho

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Number in Party: 6

Research Locations: Iqaluit

SUMMARY

As harvesting trail safety is jeopardized by climate change and environmental hazards, country food procurement can become difficult. In a prior qualitative study, several members of our team discovered that, in these leaner times of decreased country food harvest, community members seek sustenance elsewhere—very often at the grocery stores. The body of evidence associating such retail food environments to diet-related health outcomes is expanding. Investigating grocery sales allows for rigorous, cost-effective, and time-efficient monitoring of store-bought contributions to population diet, nutrition, and health. Using grocery retailer-donated data from 21 stores across Nunavut, this research will, for the first time in the circumpolar North, explore store-bought components of the local diet.

A multi-community perspective: Important conditions and habitat for dolphin and union caribou wellbeing

License Number: 04 001 22R-M

Principal Investigator: Hanke, Andrea

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Number in Party: 2

Research Locations: Cambridge Bay, Kugluktuk

SUMMARY

My research focuses on supporting co-management processes during this increasingly difficult period. My first research objective is to create collective accounts of Inuit Qaujimagatuqangit around this herd from interviews in 2003 (Kugluktuk and Ekaluktutiak), 2018-2019 (Kugluktuk), and 2021 (Kugluktuk, Ekaluktutiak, Ulukhaktok). My second research objective is to connect Inuit Qaujimagatuqangit and conventional Western science in ways that are consistent with both ways of knowing.

Evaluation of Arctic wildlife surveillance initiatives during the COVID-19 pandemic

License Number: 04 008 22N-A

Principal Investigator: Henderson, Rita

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Number in Party: 4

Research Locations: Kugluktuk, Cambridge Bay

SUMMARY

The COVID-19 pandemic (March 2020-present) has presented obstacles to continuing wildlife surveillance programs. Understanding how such programs can adapt and improve in the face of COVID-19, or other such restrictions, will advance wildlife conservation more generally. Our research objectives for this project are to identify barriers to the community-based muskox and caribou health surveillance program (led by Dr. Kutz' research team out of the University of Calgary) that have arisen during the COVID-19 pandemic, in order to evaluate if and how barriers were overcome.

Peary caribou, muskoxen and their predators: the value of Indigenous Knowledge in informing species recovery

License Number: 04 026 22N-M

Principal Investigator: Humphries, Murray

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Number in Party: 8

Research Locations: Grise Fiord, Resolute Bay, Gjoa Haven, Cambridge Bay, Kugaaruk, Taloyoak

SUMMARY

The collaborative research initiative will document Inuit/Inuvialuit Knowledge of the impacts of climate change on the interactions between Peary caribou, muskoxen and their predators. The research will combine Inuit/Inuvialuit Knowledge and western science and create a multi-disciplinary training program to enhance local research capacity and collaboration with Arctic communities. The research questions were co-developed with community partners through an engagement process in 2020 related to the draft federal Peary caribou Recovery Strategy. The aim is to address key knowledge gaps for terrestrial habitat protection to aid with the species' recovery. Our partnership includes 12 Inuit/Inuvialuit organizations, 4 Universities and several federal and territorial agencies. Our ultimate goal is to help with a national recovery strategy for Peary caribou. This research will generate knowledge to inform policy on the protection of habitat deemed critical for the survival and recovery of Peary caribou. Our partners will use the knowledge to inform regional wildlife plans and management.

The Nunavut Search and Rescue Project

License Number: 05 018 22N-M

Principal Investigator: Kikkert, Peter

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Number in Party: 15

Research Locations: Iqaluit, Rankin Inlet, Gjoa Haven, Kugluktuk

SUMMARY

Guided by the Inuit first responders on our research team, the Nunavut SAR Project (2022-2025) aims to address these challenges by strengthening SAR preparedness, prevention, and response in the region. To do so, we will work with community and government responders to explore:

- SAR strengths and challenges;
- SAR best practices and lessons learned;
- Future requirements for SAR;
- Solutions and new approaches; and
- Infrastructure needs.

Community-based yearly traditional knowledge collection to inform caribou & muskox management

License Number: 04 003 22N-M

Principal Investigator: Kutz, Susan

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Number in Party: 5

Research Locations: Kuguktuk, Cambridge Bay

SUMMARY

This pilot project will be conducted in Kugluktuk (Nunavut). The field work will take place in the communities from winter to summer 2022. To gather knowledge on muskoxen and caribou we will interview regular harvesters on their perspective and observations on those two species during their travels and hunting over the past year. The interviews will be summarized to get an overall idea of the health and trends of the muskox and caribou populations. Those interviews will serve as a pilot project, and we aim to conduct them every year in the community. This will help to detect changes and new concerns regarding the muskox and caribou populations around the community.

Ukkusiksalik National Park marine baseline data collection

License Number: 03 009 22R-M

Principal Investigator: Lafortune, Aurelie Chagnon

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Number in Party: 3

Research Locations: Naujaat, Chesterfield Inlet, Rankin Inlet, Coral Harbour, Baker Lake, Arviat, Igloolik

SUMMARY

The primary goal of the project is to reflect Inuit knowledge in 3 subprojects. The results of the pilot project will contribute to best practices for the Nunavut Field Unit of Parks Canada to be able to best engage Inuit Knowledge in its monitoring program for Ukkusiksalik National Park in the future. It will also assist in continuing to protect and present the park to the public.

Social commerce and the evolution of Inuit entrepreneurship online

License Number: 03 010 22N-A

Principal Investigator: Lane, Jennifer

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Number in Party: 1

Research Locations: Arviat, Iqaluit, Pangnirtung, Rankin Inlet

SUMMARY

This study seeks to understand and explore the influence social commerce has on the evolution and creation of Inuit entrepreneurship online. The primary objectives are the following:

1. To undertake a review of the literature on the interaction of social commerce and entrepreneurial behavior.
2. Undertake a review of the literature on the interaction of social commerce and indigenous people.
3. Undertake primary research into use of social commerce and its effects within the Inuit entrepreneurial community.
4. Present finding of primary research in the light of the body of literature.

Inunnguqsajait-Becoming Able in Inuit language, culture, identity centered, bilingual schools

License Number: 01 002 22R-M

Principal Investigator: Lee, Cathy

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Number in Party: 4

Research Locations: Pangnirtung, Qikiqtarjuaq

SUMMARY

This study will determine how the Inuit language, culture and identity-centered bilingual school program grounded in Inuit worldview in Qikiqtarjuaq and Panniqtuuq that supported students in becoming able human beings (inunnguqsajait), was developed and came to be. This study will share the narratives of some community members.

How can research better serve Nunavummiut?: Assessing research trends in Nunavut (2004-2018)

License Number: 01 029 22R-M

Principal Investigator: Ljubicic, Gita

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Number in Party: 15

Research Locations: Iqaluit

SUMMARY

Our analysis of research licensing is a first step towards identifying ways to improve Inuit engagement in research, make research results more accessible to Nunavummiut, reduce community research fatigue and encourage research on issues that are priorities for Inuit. This project has contributed to the NRI's ability to review and track research licenses, as well as to help align their work with Nunavut's research needs. The NRI will use these results to inform a possible future review of Nunavut's Scientists Act and other changes to research policy in Canada's North. Through this licensing review and first analysis of research trends in Nunavut, we identified some shortcomings of the current licensing process related to research fatigue, gaps, review burden, and lack of transparency. We have already secured new funding through a SSHRC Insight Grant to undertake a broad consultation across Nunavut to address some of these challenges. Over the next four years we will work through an expanded partnership to help inform a Nunavut-specific approach to implementing the National Inuit Strategy on Research. Ultimately our goals are to contribute to improving research engagement, capacity, and outcomes across Nunavut.

***'aɪs/, 'graus/, 'klɪf/, 'træp/*: Canadian Raising and Shift in the Arctic Circle**

License Number: 03 004 22N-M

Principal Investigator: Loras, Vicky

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Number in Party: 3

Research Locations: Iqaluit, Rankin Inlet

SUMMARY

My primary objective is to illustrate how very present the phenomena of Canadian Raising and Shift still are in Canadian English, despite the strong influence coming from US English; and how they are present in Inuit English as well, and what the strength in each variety is regarding these two phenomena. I am focusing on the phonology of Canadian Raising and Shift in both the English of Canadian-born and Canadian-raised individuals, and the English of Inuit. I have also started learning Inuktitut, in order to study and understand the phonology and functions of the language and its dialects.

BEARWATCH: Monitoring impacts of Arctic climate change using polar bears, genomics and traditional ecological knowledge

License Number: 05 019 22R-M

Principal Investigator: Lougheed, Stephen

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Number in Party: 12

Research Locations: Gjoa Haven, Coral Harbour

SUMMARY

Research will integrate/map polar bear knowledge and translate findings into a scat community-based monitoring protocol that will track polar bear population responses to environmental change. Research questions include: Are polar bear science data, IQ, and historical records from wildlife archives comparable? ii. What do the three polar bear knowledge sets tell us about demographic changes in polar bears? iii. How can our results add to existing polar bear management through new knowledge for use in decision making?; iv. Can polar bear community-based monitoring contribute to understanding bear population trends and climate change?

Inuit knowledge on the health of Auyuittuq National Park's ecosystems/environment: Climate change vulnerability assessment and pilot project for ongoing monitoring

License Number: 02 005 22R-M

Principal Investigator: Mahy, Maryse

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Number in Party: 2

Research Locations: Pangnirtung, Qikiqtarjuaq

SUMMARY

The overall goal of the project is to include Inuit knowledge in Parks Canada's assessment of the health of the park's ecosystems. The immediate objectives of the project are as follows: To collect Inuit knowledge for a climate change vulnerability assessment project for the park, and to test a method for monitoring/studying the health of the park's ecosystems/environment through Inuit knowledge in the long term.

An understanding of the drivers of food security in Clyde River and Pond Inlet, Nunavut, Canada and whether the outcome of Baffinland's Mary River Mine expansion proposal could Impact it

License Number: 02 042 22N-A

Principal Investigator: McMillan, Isabella

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Number in Party: 2

Research Locations: Clyde River, Pond Inlet

SUMMARY

The purpose of this project is to examine the possible influences of the Baffinland Mine expansion on the food security of the residents of Pond Inlet and Clyde River. This research will inform an understanding of the drivers of food insecurity and what initiatives and programs could be implemented to help support the residents as a long term solution, recognising the nutritional value of country foods. The findings and results from the research will be released in the format of a Master's thesis report, summary article and short video-with both the article and video accessible in English and Inuktitut.

Assessing One Health competencies and learning outcomes: Focus group of climate change professionals

License Number: 01 033 22N-M

Principal Investigator: McMullen, Carrie

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Number in Party: 6

Research Locations: Iqaluit

SUMMARY

The short-term objective of this research is to identify the competencies (i.e., knowledge, skills, attitudes, beliefs) that are important for success in climate change-related employment positions, and for solving climate change. The long-term objective of this research is to form an evaluation framework to assess if One Health programs across Canada are adequately training students to tackle complex problems in the workforce.

IndWisdom

License Number: 03 019 22N-M

Principal Investigator: Ninomiya, Melody Morton

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Number in Party: 10

Research Locations: Rankin Inlet

SUMMARY

For this case study, we will conduct 2-3 focus groups between October-December 2022 with community members in Rankin Inlet who were part of the original Kasuutittiaqatigiingniq Research Project, the current Miqqut Project, and members of Ilitaqsiniq. Participants will be recruited by members of Ilitaqsiniq. The focus groups will be audio recorded and transcribed; an interpreter will be present for translating English and Inuktitut. This research will benefit Ilitaqsiniq by reporting back the evidence-based findings from their program, which can be used for future planning and applications for funding. It has the potential to benefit community with future programming. Ilitaqsiniq will also receive an artistic representation of their program that demonstrates how particular contexts and mechanisms/processes lead to certain outcomes. These results will be presented to Ilitaqsiniq by March 2023 via zoom, and they will choose the best way to share the results with community members moving forward.

Examining research policy and practice in Canada's North to support evidence-based decision-making

License Number: 01 017 22R-M

Principal Investigator: Perrin, Alison

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Number in Party: 2

Research Locations: Iqaluit

SUMMARY

Across the Canadian North there are concerns being expressed about how research in the region happens, what topics it is focused on, who is involved, who makes decisions, and where the benefits and investments land. Northern governments and organizations have identified the need for relevant research, accessible results, and engagement with northern communities. Northerners want to see tangible benefits from research for their region whether it is for improving policy, supporting community well-being, building a local knowledge economy, or building capacity through education or infrastructure. Currently, there is only anecdotal evidence of recent efforts to improve research in the North, and this project aims to fill that gap by providing evidence on the current state of research, how it has improved, and what still needs to be done to inform future research programs and policies.

Canada's Arctic waste future: A pilot project

License Number: 01 023 22R-M

Principal Investigator: Renders, Micky

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Number in Party: 2

Research Locations: Iqaluit, Pangnirtung

SUMMARY

The aim of the proposed project is to highlight waste issues in Nunavut within the context of settler colonialism and contemporary national and international natural resource development in the Arctic. In Phase I of our proposed project, we will meet with permanent and non-permanent residents of Pangnirtung and Iqaluit, to discuss the feasibility of creating a multi-disciplinary art project on the theme of waste. This will include conversations with community group members, resident educators, government officials, local journalists, scientists, policy makers and artists. Part of our focus will be on the oral histories of Inuit and other lifelong Nunavut residents to begin to examine longer-term understandings of waste and settler colonialism. Using art as our common language, our long-term goal is to facilitate the development, creation and performance of an original work of performance art that will respond to the topic of waste from both a socio-political and personal point of view.

Inuit & Southern perspectives on a long term environmental monitoring partnership in the North

License Number: 01 021 22N-M

Principal Investigator: Richard, Samuel

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Number in Party: 3

Research Locations: Kinngait

SUMMARY

Our objective is to join the perspectives of both Inuit research partners and government researchers. To do so, we want to engage in a reflection with our Inuit research partners from Kinngait. This is the community that has been most involved in eider surveys. We will conduct a 3-hour in-person workshop in each community during February 2022 to discuss the themes presented above. If suggested by Inuit workshop participants, interviews may be conducted with other community collaborators to complement the Inuit perspectives. Workshop participants will review and validate research findings during an hour-long remote working session during spring 2022, and with permission, they will be included as co-authors of a peer-reviewed publication.

Introducing the emotional and affective geographies of law: Strengthening community through the practice and feeling(s) of Inuit law

License Number: 04 022 22R-M

Principal Investigator: Robertson, Sean

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Number in Party: 2

Research Locations: Kugaaruk

SUMMARY

To better understand Inuit and legal social norms related to subsistence activities and other areas of hamlet life. The Advisory Committee chose sealing and fishing. In resonance of Inuit ways of knowing that go beyond rational thinking, the project also seeks to learn more about the role of the body, emotions and "the feeling" in certain areas related to the enactment of norms. The topic includes norms pertaining to the management of resources, the settling of disputes, interactions with non-Inuit normative orders (e.g., Canadian Law), etc.

Walrus Hunting in a Changing Arctic

License Number: 02 048 22N-A

Principal Investigator: Ruiz Puerta, Emily Joana

Affiliation: Arctic Centre
University of Groningen
Groningen, The Netherlands

Number in Party: 2

Research Locations: Igloodik

SUMMARY

My research focuses on examining ancient DNA (aDNA) of walrus, which I have extracted and examined from different parts of their bones and muscles; most of these remains are the result of hunting from several periods over time—Sivullirmiut, Dorset, Tuniiit, Thule and Modern Inuit. Our preliminary results have shown how climate (temperature, ice conditions, etc.) have shaped the number and distribution of walrus over the past 30,000 years. However, several questions remain, and I would very much like to consult with modern walrus hunters in order to address gaps in the knowledge, and also to better centre Inuit perspectives in future research. For example, I would like to discuss the economic importance—to individuals, families and the community—of walrus; how traditional knowledge about hunting tools and techniques is passed from one generation to the next; and feelings regarding the effects of changing ice conditions on their ability to be successful in their hunts. Feedback from hunters on these topics will help us better understand the rich and dynamic history of walrus hunting in Inuit Nunangat waters. It is important to note that I and all my research associates fully understand, appreciate and value the importance of walrus and all animals providing country food as vital cultural and economic resources for Iglulingmiut; this research is not designed to limit Inuit access to their resources in any way. All participants will be compensated for their time and expertise.

Country food cargo: Transport infrastructure and imagined futures on Baffin Island, Nunavut

License Number: 01 028 22N-M

Principal Investigator: Schmid, Katrin

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Number in Party: 2

Research Locations: Iqaluit, Pond Inlet

SUMMARY

Currently, much of the infrastructure built in Nunavut prioritizes extractive industries over daily necessities like access to clean water, food, housing, and a regular income. This proposed research examines the ways residents of Iqaluit and Pond Inlet think about the futures of their communities and how that relates to the transport infrastructure being built and planned today. My research question is: How do local residents' imagined futures and the development of transport infrastructure in Nunavut co-constitute each other?

FISHES: Fostering Indigenous small-scale fisheries for health, economy, and food security

License Number: 05 002 22R-M

Principal Investigator: Schott, Stephan

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Number in Party: 18

Research Locations: Cambridge Bay, Gjoa Haven, Taloyoak, Kimmirut, Qikiqtarjuaq, Naujaat

SUMMARY

The goal of this research is to understand how to sustainably harvest and manage culturally-important fish stocks in the face of climate change, socioeconomic and cultural change, and governance challenges. This research will combine biology, fisheries science, social science and Indigenous knowledge to address challenges related to food security and management of fisheries. In Nunavut, research will focus on arctic char, but related research in other northern regions will also consider other fish species. We expect this research will provide knowledge that will help northern communities, their governments, people who consume fish in both Northern and Southern Canada, and the federal government, by increasing understanding of the role of fish in Northern Canada and the best ways to manage fisheries sustainably.

Unstitching the Past

License Number: 02 001 22N-M

Principal Investigator: Siebrecht, Matilda

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Number in Party: 2

Research Locations: Igloolik

SUMMARY

Much of my research involves experimental archaeology—the creation of replica objects to see how they were made and/or used in the past. Over the past year, I have been replicating Tuniit-style needles made from bone, antler, and ivory, and using them to sew a variety of items made of seal, caribou, and fox skins. The aim of these experiments is to understand why the Tuniit made and used their needles in the way that they did. Were they restricted in their actions by functional barriers, or were their actions guided by more culturally-defined rules?

Access to safe, sustainable, & healthy housing in Cambridge Bay, Nunavut

License Number: 04 030 22N-M

Principal Investigator: Song, Gloria

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Number in Party: 2

Research Locations: Cambridge Bay

SUMMARY

The purpose of this project is to conduct an institutional ethnography to understand people's experiences of the housing shortage in Cambridge Bay, Nunavut, with the objective of understanding how housing-related processes (such as public housing applications, landlord-tenant disputes, and other matters relating to securing sustainable housing) play out in reality, as people experience them, compared to the way such processes have been prescribed in institutional texts and legal frameworks.

Understanding how these processes work and what disconnections there may be between institutional/legal frameworks and reality will in turn inform broader questions about what access to justice means in Nunavut. This project's approach will also be informed by Inuit Qaujimajatuqangit, and will incorporate guidance provided by Inuit for conducting research ethically and respectfully in Inuit Nunangat. In conceptualizing access to justice in Nunavut by using institutional ethnography as the research methodology, informed by Inuit Qaujimajatuqangit, this proposed research will also provide a unique opportunity to analyze the practical compatibility between the three conceptual frameworks of access to justice, institutional ethnography, and Inuit Qaujimajatuqangit.

Supporting diverse women and girls with disabilities in Canada through a livelihoods approach

License Number: 01 041 22N-M

Principal Investigator: Stienstra, Deborah

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Number in Party: 15

Research Locations: Iqaluit

SUMMARY

- 1) What do diverse women and girls with disabilities in Iqaluit perceive as opportunities and barriers to achieving their goals and dreams?
- 2) And, how will the lived experiences and knowledge of girls and women with disabilities contribute to improving policies, programs, and practices to support their dreams?
- 3) The objective of this research is to uncover, create, and share knowledge about women and girls' struggles for and progress toward disability-inclusive development, and have women and girls with disabilities contribute to discussions of rights and justice. Women and girls with disabilities face systemic inequalities because of their multiple and intersecting social realities, which make them among the most marginalized groups in the world. They are experts in knowing the barriers to achieving their livelihoods, and how to dismantle them.

Comparative beluga health: Examining Eastern Beaufort Sea and Western Hudson Bay beluga whales

License Number: 03 006 22N-A

Principal Investigator: Sudlovenick, Enooyaq

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Number in Party: 3

Research Locations: Arviat

SUMMARY

Arviat harvests many belugas whales every year as part of their subsistence hunts. Although Nunavut has some basic monitoring programs for beluga, the programs are limited, and data does not always return to the community. This project will aim to identify methods of determining beluga whale health in Arviat, and on a larger scale compare this Western Hudson Bay (WHB) population to the Eastern Beaufort Sea (EBS) population in Northwest Territories. The main goal of this project is to enhance knowledge of the health status of the beluga whale population in the EBS and WHB.

Inuksiutit: Food sovereignty in Nunavut and the co-production of country food knowledge (IFSNU)

License Number: 03 018 22Registry

Principal Investigator: Tagalik, Shirley

Affiliation: Aqqiumavvik Arviat Wellness Society
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Number in Party: 15

Research Locations: Arviat

SUMMARY

This Inuit-led project seeks to record and share knowledge of Inuit country food systems and food preparation. The research project will advance goals of achieving food sovereignty in Inuit Nunangat by sharing knowledge about ways of preparing and preserving country food, and asserting the importance of country food to Inuit culture and health. This research will also help to support public health decision-making, and support communities to continue to keep country food safe.

Learning from one another: A comparative analysis of labour market needs and corresponding skills in Yukon, Nunavut and Northern Ontario

License Number: 01 040 22N-M

Principal Investigator: Thompson, Amanda

Affiliation: Conference Board of Canada
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Number in Party: 2

Research Locations: Iqaluit

SUMMARY

The Conference Board of Canada and its partners are conducting research to better understand the evolving labour market needs of three distinct Northern regions – Yukon, Nunavut and Northern Ontario. We will map the findings of this needs assessment against existing skills within these regions to determine corresponding employment gaps and opportunities. The project will also highlight leading practices in skills development that can be used to meet emerging labour market demands and identify opportunities for developing new approaches to skills development.

Inuksiutit: Food sovereignty in Nunavut and the co-production of country food knowledge (IFSNu)

License Number: 03 03 22N-M

Principal Investigator: Wachowich, Nancy

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Number in Party: 18

Research Locations: Pond Inlet, Arviat

SUMMARY

Our community-based research project responds to challenges identified in the Inuit Tapiriit Kanatami (ITK) Food Security Strategy, ITK Climate Change Strategy, and National Inuit Strategy on Research (NISR). This Inuit-led project seeks to record and share knowledge of Inuit country food systems and food preparation. The research project will advance goals of achieving food sovereignty in Inuit Nunangat by sharing knowledge about ways of preparing and preserving country food and asserting the importance of country food to Inuit culture and health. This research will also help to support public health decision-making, and support communities to continue to keep country food safe.

An early childhood education diploma program for Inuit women in Nunavut, Canada

License Number: 02 050 22N-M

Principal Investigator: Wasalik, Tin Zoo (Tina)

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Number in Party: 2

Research Locations: Pond Inlet

SUMMARY

My main objective is to promote blended educational approaches as an effective means of instruction and learning in Arctic education. I will achieve this objective by interviewing participants about their educational and employment experiences following the 2015-2017 ECE Diploma Program. In addition to a written dissertation, I plan on turning my research findings into a report which will be presented to the Government of Nunavut. By completing this academic research, I hope that the Government of Nunavut will recognize the benefits of this Diploma Program for Arctic communities and allocate funds for future programs across the territory.

Movement and habitat use of anadromous Arctic char (*Salvelinus alpinus*) and Dolly Varden (*Salvelinus malma malma*) near Kugluktuk, Nunavut

License Number: 04 011 22R-M

Principal Investigator: Weinstein, Spencer

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Number in Party: 2

Research Locations: Kugluktuk

SUMMARY

Gather traditional knowledge relating to diversity of char in the Coppermine River and recently witnessed changes in char in the system. The Coppermine River, bordering the Hamlet of Kugluktuk, has historically supported a subsistence fishery for Arctic char. Since 2015, community members have reported a decrease in the number of char returning to the river following summer migration, and changes in fish appearance. Given these observed changes and the concerns of community members, a partnership was established in 2017 between the Kugluktuk Hunters and Trappers Organization (HTO), the University of Waterloo, and Fisheries and Oceans Canada (DFO) to study char in the Coppermine River. As part of this project, researchers will evaluate the degree to which local descriptors correspond with variation measured using western scientific analyses.

Nunavut water resource management

License Number: 02 002 22R-M

Principal Investigator: Wesche, Sonia

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Number in Party: 4

Research Locations: Sanirajak, Igloolik, Coral Harbour

SUMMARY

Sustainable freshwater sources are important for northern community development and planning; however, many northern communities in Canada lack knowledge about their existing water supply, baseline demand, and recharge potential. The communities of Igloolik and Sanirajak were identified as having limited capacity for future growth in their municipal water supply. This project involves water resource assessments in Igloolik and Sanirajak to understand how water supply and capacity will be influenced by continued population growth and climate change, and to provide decision-makers with data for improved water management. We will focus on Inuit perspectives about water in their communities, water-related health concerns, and potential alternative water sources that may be used (or preferred) in the future.

Inuit Qaujimaningit and socioeconomic baseline studies for the Chidliak Project

License Number: 01 014 22R-M

Principal Investigator: Willis, David

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Number in Party: 8

Research Locations: Iqaluit, Pangnirtung

SUMMARY

De Beers is proposing to undertake Inuit Qaujimaningit and socioeconomic baseline studies in Iqaluit and Pangnirtung in support of its Chidliak Project. The objective of this Inuit Qaujimaningit study is to incorporate traditional and contemporary knowledge and Inuit values, perspectives, and ways of knowing on a variety of topics that will inform an Environmental Impact Statement. Desktop and community-based socioeconomic research will also be undertaken concurrent with the Inuit Qaujimaningit study. This will be conducted to collect socioeconomic information and perspectives of interest from community members.

Mobilizing Inuit Qaujimajatuqangit for sea-ice safety: A Sikumiut case study to support Inuit self-determination in research

License Number: 02 035 22R-M

Principal Investigator: Wilson, Katherine

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Number in Party: 3

Research Locations: Pond Inlet

SUMMARY

The purpose of this project is to support Inuit self-determination in research through a case study in Mittimatalik (Pond Inlet), Nunavut. The goals of the project are to advance Inuit research leadership, decision-making, knowledge, approaches and capacity building. Sikumiut (people of the sea ice) is the 12-person management committee in Mittimatalik that governs the SmartICE community-based sea-ice monitoring program. At a recent meeting, Sikumiut identified the need to document their Inuit Qaujimajatuqangit (IQ) of sea-ice to support safe sea-ice travel, assess the impacts of climate change and resource development, and to share this knowledge with the community and future generations.

Mobilizing Inuit Qaujimajatuqangit for sea-ice safety - Phase 2: Expansion to Arctic Bay, Arviat, Gjoa Haven and Qikiqtarjuaq

License Number: 05 010 22R-M

Principal Investigator: Wilson, Katherine

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Number in Party: 6

Research Locations: Arctic Bay, Arviat, Gjoa Haven, Qikiqtarjuaq

SUMMARY

Climate change has caused unpredictable ice travel conditions in Nunavut. This has led to more accidents and search-and-rescue incidents during the ice season. The colonization of Inuit has also resulted in generations denied the experience of learning from their Elders how to safely travel on ice. It is Inuit Qaujimajatuqangit (IQ) passed down through generations that teaches youth how to plan, prepare, identify, and test the ice for safety while traveling. Inuit want to document and share their IQ to:

- Improve ice travel safety skills and emergency prevention for Inuit youth in their communities; and
- Share and monitor known and changing hazardous ice locations so they can adapt and maintain community ice travel.

Bridging the knowledge policy gap? Linking Arctic community-based monitoring to environmental governance and decision-making

License Number: 01 012 22N-M_Amended

Principal Investigator: Wilson, Nicole

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Number in Party: 2

Research Locations: Sanikiluaq, Chesterfield Inlet, Coral Harbour, Naujaat

SUMMARY

The purpose of this research is to examine the relationship between Arctic CBM and environmental decision-making and governance processes. The study has two objectives:

- To explore how environmental governance systems shape the development, implementation, and mobilization of CBM data in decision-making; and
- To evaluate what elements of CBM program design facilitate or constrain the use of CBM data in decision-making processes.

Canadian Northern Corridor Community Engagement Program

License Number: 03 16 22N-A

Principal Investigator: Winter, Jennifer

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Number in Party: 8

Research Locations: Rankin Inlet, Kugluktuk

SUMMARY

The Canadian Northern Corridor Research Program is looking to hear from northern and Inuit communities about local and regional infrastructure issues and priorities. The Canadian Northern Corridor is an idea about how to address infrastructure deficits in the Canadian North and to better connect the region, both internally and with the rest of Canada. The ‘Corridor’ concept involves researching the potential of multi-modal infrastructure corridors or corridor networks to meet regional needs and priorities as well as build on existing and planned infrastructure projects such as the Kivalliq Hydro-Fiber Link and the Grey’s Bay Road and Port project.

Updating the Qikiqtani Labour Market Analysis

License Number: 01 001 22Registry

Principal Investigator: Wolcott, Jamie

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Number in Party: 3

Research Locations: All Baffin Communities

SUMMARY

In 2020, MiHR's Qikiqtani Labour Market Analysis (QLMA) established a foundational approach for understanding the availability of Inuit labour supply in the Qikiqtani region. This study was conducted to inform the continued development of the Inuit Impact Benefit Agreement (IIBA) between Baffinland and the Qikiqtani Inuit Association (QIA). Specifically, QLMA findings are useful for appraising whether recruitment goals are likely to be effective and manageable versus resource-intensive and seemingly impractical. These findings are also applicable for identifying where there exist labour market gaps and shortcomings in certain occupational categories (e.g., Trades) and skill categories (e.g. Statistics Canada's Skill Level Categories). This project will provide a quantitative update to the 2020 QLMA, improve data inputs and offer new features to support a more robust analysis.

Qatiktalik: Nexus of colonial encounters

License Number: 03 001 22R-M

Principal Investigator: Zawadski, Krista

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Number in Party: 2

Research Locations: Chesterfield Inlet, Rankin Inlet, Igloolik, Sanirajak, Naujaat

SUMMARY

My project will focus on Qatiktalik and reinterpret known history through Inuit eyes. Research publications and museum collections are out of reach for most Inuit who are directly connected to this history. It is my main goal to bring this history to modern descendants of people who were once at Qatiktalik during the time it was in operation as a whaling site and NWMP post and to engage with Inuit oral history surrounding Qatiktalik. I will do this through group discussions and documentation with Elders and community members at Igluligaarjuk, Rankin Inlet, Naujaat, Iglulik and Sanirajaq.

Indigenous clothing ensembles: Indigenous knowledge & performance evaluations to enhance Northern safe practices

License Number: 03 008 22N-A

Principal Investigator: Barker, Anne

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Number in Party: 4

Research Locations: Arviat, Pangnirtung, Rankin Inlet

SUMMARY

The goal of this project is to investigate how Indigenous clothing can, as part of harsh weather personal protective equipment, lead to increased personal safety and security in Arctic environments. The study is needed for two reasons. Indigenous Knowledge provides leadership when it comes to protecting people from the elements in northern, often harsh, environments, with hundreds of years of successful development of clothing to protect people from the environment. Garments have been developed with natural items, through observations that the materials have properties that promote water resistance, wicking, and heat retention; all properties required for northern operations. However, there has been little research on the thermal protection offered by such clothing. Because of this, it can be difficult for crafters to promote their clothing compared to large-scale, commercially available clothing that typically has undergone such testing. Secondly, government departments with operational requirements in the Arctic have commented that the typical clothing worn by their personnel are a limiting factor for successful operations in the North. Frostbite, hypothermia, and challenges with basic usability of equipment with bulky outerwear, are all example problems faced by staff.

From settlement to self-determination: Towards an anthropology of educational change in Nunavut

License Number: 01 031 22N-A

Principal Investigator: Ertman, Selina

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Number in Party: 2

Research Locations: Iqaluit

SUMMARY

My research focuses on educational change in Nunavut and asks the following key questions: 1) How has self-determination underpinned narratives about the future of education in Nunavut? 2) How illustrative and/or instructive is Nunavut in the broader international and circumpolar context regarding educational change and Indigenous self-determination? To respond to these questions, I will analyze how the territory's education system has shifted from a period of "settlement" to "self-determination," ranging from the late nineteenth century to now.

A collaborative research project with Inuit youth, families and their communities about informal education practices, community-driven science research and lifelong learning with important implications for Inuit education and perseverance

License Number: 05 007 21R-M-Amended

Principal Investigator: Rahm, Jrene

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Number in Party: 6

Research Locations: Arviat, Pond Inlet, Sanikiluaq

SUMMARY

The purpose of the collaborative community project is the description and documentation of Inuit ways of learning with Inuit youth, families and their communities. The three-year collaborative community project is also closely aligned with the research priorities of the National Strategy of Inuit Education. We initiated collaborations with four programs in three communities in Nunavut to pursue our goal of describing lifelong learning and a holistic model of Inuit education.

Natural/Physical Science Research

The Arctic Observing Network: Renewing observations at the Davis Strait Gateway

License Number: 01 025 22R-M

Principal Investigator: Lee, Craig

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Number in Party: 21

Research Locations: Davis Strait, Cape Dyer

SUMMARY

The Davis Strait observing system matches ongoing collections at Bering Strait, Utqiagvik, Alaska, and Fram Strait to extend the time series of concurrent measurements across the major Arctic Gateways, to allow the analysis of several important science questions. In 2021, scientific moorings will be installed in the Davis Strait with support from the Greenlandic R/V Sanna to:

- Quantify change in Arctic freshwater and heat balances;
- Understand the interactions between Arctic change and global climate;
- Document changes in Arctic Ocean acidification and potential impacts on subpolar oceans; and
- Establish a sustained, international integrated Arctic Observing Network.

Impacts of air pollution on terrestrial and aquatic ecosystems on Southern Baffin Island

License Number: 01 011 22R-M

Principal Investigator: Aherne, Julian

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Number in Party: 2

Research Locations: Outskirts of Iqaluit and Kimmirut

SUMMARY

The impact of atmospheric emissions on air quality in the Arctic is expected to increase as new and expanded economic developments trigger growth in marine traffic and resource extraction. Emissions of sulphur dioxide and nitrogen oxides can contribute to ecosystem acidification and eutrophication in regions characterized by acid sensitive geology and nutrient poor soils, such as Baffin Island. This project will use a critical loads approach to quantify the assimilative capacity of arctic terrestrial and aquatic ecosystems to pollutant deposition. Lake water in the Iqaluit regions (20 study catchments) will be sampled for chemical analysis. In addition, moss and soil samples will be collected at the study sites, and vegetation surveys will be carried out to assess terrestrial ecosystem impacts.

Preliminary examination of glacial-marine coupling in a seasonally ice covered High Arctic fiord

License Number: 02 010 22N-M

Principal Investigator: Babb, David

Affiliation: Centre for Earth Observation Science
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Number in Party: 6

Research Locations: Expedition Fiord, Strand Fiord

SUMMARY

The specific objectives of this project are to:

- 1) Collect physical ice and snow samples from various ice types and along a transect from the marine to glacial environment for biogeochemical analysis, specifically, nutrients, bromine, and other freshwater tracers;
- 2) Characterize the spatial variability in ice thickness and snow depth in the area to differentiate between different ice types that are present in the fjord; and
- 3) Characterize the spatial variability and structure of the water column including measurements of current velocities, particularly near the front of Iceberg glacier and collect complementary water samples for distinguishing between seawater and meteoric water in the area.

Arctic Carbonate Rocks, Ellesmere Island, Nunavut

License Number: 02 025 22R-M

Principal Investigator: Beauchamp, Benoit

Affiliation: Department of Geoscience
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Number in Party: 3

Research Locations: Blue Mountains, Ellesmere Island

SUMMARY

We will investigate different rock units of carbonate rocks that have recorded important interplay between large forces some 300 million years ago in the area now occupied by the Canadian Arctic. We will focus on an area of the Sverdrup Basin centered on Ellesmere Island, where this phenomenon is well displayed in outcrops of ancient reefs that responded to these forces.

Trace element and oxygen isotope distribution in corundum and spinel, Southern Baffin Island

License Number: 01 019 22R-M

Principal Investigator: Belley, Philippe

Affiliation: Department of Earth Sciences
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Number in Party: 2

Research Locations: Kimmirut Area

SUMMARY

Our goal is to improve our scientific understanding of trace element and oxygen isotope distribution in spinel, and gem/non-gem corundum (sapphire). Field work will be conducted primarily (but not exclusively) at three spinel and sapphire occurrences on the former Tru North Gems Property. Rock samples of interest to our research will be picked up (when loose), or extracted with hand tools. Power tools may be used where hand tools are ineffective. The quantity of samples taken from each site, expected to range from 1 kg to 50 kg, depends on the complexity of the rock. Additional quantities of sample may be provided by parties conducting exploration in the area.

Impacts of melting tidewater glaciers on marine biogeochemical cycles

License Number: 02 014 22R-M

Principal Investigator: Bhatia, Maya

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Number in Party: 8

Research Locations: Devon Island, Ellesmere Island

SUMMARY

This project began with an inaugural field campaign in 2019. The results of these efforts have resulted in two recently submitted scientific publications, and have formed the basis of two graduate student projects. We have also made three videos that have been shared with the community summarizing our findings to date. In 2020, due to the COVID-19 global pandemic, the majority of our field activities were suspended though the S/Y Vagabond and crew were able to conduct a limited field season for us – this represents invaluable data collected during a year in which most Arctic work was suspended. In 2021, we are hoping to achieve many of our original plans for 2020, particularly with regards to working out of the Hamlet of Grise Fiord and hiring local boats and students. We hope that if successful this year, the hiring of local boats will become a long-term component of our project for which we can annually apply to external funding sources to support.

Assessment of coastal contamination in trace metals in marine sediments near Kugluktuk

License Number: 04 029 22N-A

Principal Investigator: Brice, Camille

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Number in Party: 2

Research Locations: Kugluktuk

SUMMARY

The proposed project is part of a PhD project at UQAR, partly funded by the Northern Scientific Training Program of Polar Knowledge Canada. The PhD project is an assessment of trace metals contamination in marine sediment from the Canadian Arctic Archipelago (CAA), with a special interest for areas close to northern communities. It will provide baseline information on the CAA seafloor chemical composition and will help to determine the ecological risk associated to trace metals contamination. Data collected for the proposed project and resulting information will provide baseline geochemical data for coastal surface sediments from Kugluktuk, which will help to distinguish between natural concentrations of potentially toxic elements and anthropogenic contamination. In the future, these geochemical data can then help federal government agencies with assessing environmental risk and setting regulatory levels of pollutants in coastal areas near Kugluktuk.

Lake ice in the Canadian High Arctic

License Number: 02 018 22R-M

Principal Investigator: Brown, Laura

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Number in Party: 6

Research Locations: Resolute, Polar Bear Pass

SUMMARY

Lake ice is an important part of the cryosphere and recent projections suggest a pan-arctic reduction by the end of the century in ice duration (ranging from 20 to >100 days) and thickness (ranging from 30 cm to > 1 m). Since the majority of ground-based ice observations in Canada ceased by the 1990s, recent changes in ice regimes have been primarily noted through modelling and remote sensing. Observation data, essential for validating both remote sensing and modelling research, is currently inadequate though some volunteer monitoring efforts have emerged since the decline of Canada's monitoring network and have been utilized for ice research. As changes are noted in ice regimes, we need to fully understand the implications and response in terms of water and energy balance and their effects on other areas of research (e.g., limnology, transportation). To achieve this, in situ data of lake ice in Canada is being collected across a latitudinal gradient (temperate, sub-Arctic, High Arctic). The field data will be used to improve the effects of snow cover on modelled ice thickness, as well as to isolate how the duration of the modelled ice break-up season is affected by the shape/size of the lake. Resolute and Polar Bear Pass provide ideal locations for the High Arctic portion of this study and data collection is underway.

Glacial mass balance studies in the Canadian High Arctic

License Number: 02 013 22R-M

Principal Investigator: Burgess, David

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Number in Party: 3

Research Locations: Queen Elizabeth Islands

SUMMARY

Knowledge of the mass balance of ice caps and glaciers in the Canadian High Arctic provide important insight into understanding patterns of climate change, and validating current estimates of global sea-level contributions from this region. Through continuation of the long-term time series (~50 years) of annual surface mass balance measurements for the Northwest Devon ice cap, Meighen ice cap, Melville ice cap, and Agassiz ice fields, this project contributes towards the fulfillment of NRCan's mandate and ESS strategic outcomes through activities in the ESS Climate Change Geoscience Programme (CCG) – Essential Climate Variables (ECV).

Instability of permafrost landscapes from climate change and the hydrological implications to Arctic watersheds

License Number: 02 004 22R-M

Principal Investigator: Campbell-Heaton, Kethra

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Number in Party: 3

Research Locations: Eureka

SUMMARY

This research project seeks to understand the effects of climate change-induced permafrost thaw in the High Arctic. Permafrost thaw has already shown to have significant impacts to northern communities, specifically relating to water resources, flooding and terrain instability. For example, residents of four Viliui Sakha communities have noticed an increase in standing surface water and flooding, forcing them to move their dwellings to higher ground. Therefore, it is more important than ever to investigate these stressors on permafrost thaw and northern water resources, especially in the High Arctic. In this region, water resources are largely neglected from climate research because of their latitude and assumed ‘stable’ nature. Yet, modern-day permafrost studies show that Canadian High Arctic permafrost is just as vulnerable to a changing climate. For that reason, this project seeks to understand what happens to High Arctic watersheds when the ice-rich surficial permafrost begins thawing.

Access to safe drinking water in a changing Arctic

License Number: 02 020 22R-M

Principal Investigator: Comte, Jerome

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Number in Party: 8

Research Locations: Pond Inlet, Cambridge Bay

SUMMARY

Global warming is causing large-scale transformations in the Arctic, including rapid reduction in the extent of permafrost, which can threaten drinking water supplies. Increasing transfers of dissolved organic matter (DOM) from permafrost to surface waters results in the 'browning' of water, which can indirectly contribute to the prevalence of cyanobacteria, changes in the nutritional quality of aquatic food resources, and toxin production. Furthermore, contaminants and pathogens trapped in thawing soils are now released to water sources. To ensure drinking water safety, chlorine is typically used to inactivate pathogens. However, the practice of chlorinating water has both biomedical and belief-based problems; it can generate unwanted disinfection by-products (DBPs) when DOM is elevated in water, and northern communities have differing understandings of how to ensure purity of water. This transdisciplinary project aims to investigate and measure emerging risks from compounds and microorganisms released from permafrost thawing using a community-based participatory water quality sampling program.

Ice dynamics and cryospheric changes in Northern Canada

License Number: 02 019 22R-M

Principal Investigator: Copland, Luke

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Number in Party: 17

Research Locations: Glaciers and ice caps of the Queen Elizabeth Islands

SUMMARY

This research program will continue work on the current characteristics and stability of the northern Ellesmere Island ice shelves and adjacent multiyear landfast sea ice. Fieldwork started at this location in 2008, and will continue for the foreseeable future. Almost all of the ice shelves in this region have experienced dramatic break-ups over the last several years, so this project aims to improve understanding of the causes of these events and the fate of the remaining ice shelves and related ice features.

Permafrost dynamics in response to climate change on Victoria Island, Nunavut

License Number: 04 006 22R-M

Principal Investigator: Coulombe, Stephanie

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Number in Party: 12

Research Locations: Victoria Island

SUMMARY

Permafrost (frozen ground) is very vulnerable to rapid changes in climate and has the potential to affect many aspects of life for the people that live there. In this project, we are looking at how permafrost landscapes in western Nunavut are changing in a context of climate change. The objective is to study and monitor changes in the permafrost environment, with a focus on the communities of Cambridge Bay and Kugluktuk. This project has three specific objectives: (1) characterize the permafrost conditions; (2) monitor changes in permafrost landscapes; (3) assess the impacts of permafrost disturbances on the ecosystems; and (4) investigate the seasonal responses of the tundra soil microbiome. In 2022, we will also study organic soil (peat) accumulation processes in the tundra and assess the role of peat in regional and pan-Arctic carbon budgets at decadal and centennial timescales.

Coastal hazard assessment in Kugluktuk and Grise Fiord (Aujuittuq), Nunavut.

License Number: 04 009 22R-M

Principal Investigator: Coulombe, Stephanie

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Number in Party: 13

Research Locations: Kugluktuk, Grise Fiord

SUMMARY

The overall purpose of this project is to study and measure coastal erosion in Kugluktuk and Grise Fiord. This community-based research project has two objectives: 1) to gain new knowledge of the coastal erosion processes and permafrost degradation and 2) to provide learning and training opportunities, with an emphasis on youth. The implementation of this project will take a two-year phase, scheduled between 2021 and 2023, in order to have enough time to conduct research that will lead to a successful outcome as coastal erosion involves various causes of environmental activities related to climate change.

Geotechnical and environmental baseline studies – Iqaluit port development

License Number: 01 005 22R-M

Principal Investigator: Burdett-Coutts, Victoria

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Number in Party: 8

Research Locations: Iqaluit

SUMMARY

The studies will be performed for the Government of Nunavut in two locations. One is near the municipal wharf, and the other is in the proposed deep water port area and quarry. Geotechnical and environmental baseline studies are required to support the design of upgrades proposed for the municipal wharf, and a new deep water port.

Geotechnical and environmental baseline studies – Pond Inlet small craft harbour development

License Number: 02 011 22R-M

Principal Investigator: Burdett-Coutts, Victoria

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Number in Party: 7

Research Locations: Pond Inlet

SUMMARY

The Pond Inlet Offset Plan consists of two components, the Monitoring Program and the Research Program. The goal of the Monitoring Program is to assess the habitat characteristics within the footprint of the proposed Project. In future years, after construction of the facility, this will be compared to the habitat provided by the boulders/rocks that are a component of project design for shoreline protection. Rocks provide multi-dimensional habitat where marine organisms can find refuge in the spaces between them. The goal of the Research Program is to investigate the primary prey species of Arctic char in Eclipse Sound in the waters surrounding the proposed small craft harbour.

ICAAP – Increased carbon accumulation in Arctic peatlands

License Number: 02 045 22N-A

Principal Investigator: Crichton, Katherine

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Number in Party: 3

Research Locations: Pond Inlet

SUMMARY

We aim to better understand the carbon dynamics of Arctic peatlands. Currently, there is a lot of uncertainty as to whether under present and future warming these habitats will expand and/or absorb more carbon from the atmosphere, or the reverse.

- Have Arctic peatlands increased carbon accumulation and/or expanded laterally in response to warming past climates in the last several hundreds of years and over the satellite period?
- Will future climate change result in an increase of the Arctic peatland carbon store as a result of increases in accumulation and extent?
- How do our datasets compare to a land surface model that incorporates dynamic peatlands?

To answer these research questions, we employ field sampling of peat cores to analyse changes in carbon accumulation and peatland extent over the last several hundred years, and remote sensing of Arctic peatlands to consider more recent changes. To consider a climatic gradient, we sample and analyse data from the high Arctic (Svalbard and Nunavut) and from the low Arctic (Lapland and north Quebec). For the Pond Inlet Nunavut sites, we have proposed 5 sites, but will likely visit a maximum of 3. We will seek local knowledge to determine which sites are most suitable for sampling.

Investigating the Devon Ice Cap subglacial lakes

License Number: 02 012 22R-M

Principal Investigator: Criscitiello, Allison

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Number in Party: 9

Research Locations: Devon Island, Ellesmere Island, Axel Heiberg Island

SUMMARY

A recent study revealed the first evidence for a hypersaline subglacial lake complex beneath Devon Ice Cap (Canadian Arctic) using airborne geophysical survey methods. These lakes are salty enough that they can exist at temperatures of -10.50C where freshwater would rapidly freeze. As such, the lakes are globally unique and may represent a microbial habitat, which makes them compelling targets to ask fundamental questions about the existence, evolution and diversity of life in extreme environments on Earth and on other icy planetary bodies in the Solar System. The airborne geophysical data collected to date is highly effective at locating the upper surface of the lakes, however, the airborne geophysical signals cannot penetrate through the lake. Therefore, to map the lake thickness, properties and investigate the structure beneath the lake, multiple surface-based geophysical methods must be used.

Climate change effects of a changing cryosphere on northern lakes

License Number: 01 017 22R-M

Principal Investigator: Dibike, Yonas

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Number in Party: 2

Research Locations: Lake Hazen, Lower Dumbell Lake

SUMMARY

Climate change is projected to cause significant change to arctic aquatic ecosystems. Changes in the thickness and composition of arctic lake ice covers will produce second order impacts on lake biological productivity and ecology. The most important effects are likely to result from changes in temperature (ice growth) and precipitation (ice cover composition). While a number of models have been developed to model these changes, their validation has been stalled by lack of relevant field data. Relevant field data has been gathered annually since 2009. For 2021, ice-composition surveys may be repeated, depending on time and resource availability, at the above noted lakes with the assistance of local contractors or agencies. If undertaken, the proposed completion dates for the surveys at the lake sites will be between March 1 and July 30, 2021. Specific dates will be determined based on agency/contractor availability.

CANDAC-The Canadian Network for the Detection of Atmospheric Change

License Number: 02 034 22R-M

Principal Investigator: Drummond, James

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Number in Party: 3

Research Locations: Eureka

SUMMARY

The Canadian Network for the Detection of Atmospheric Change continues to operate the Polar Environment Atmospheric Research Laboratory. Aside from the impact of the COVID-19 pandemic, our operations remain targeted at approximately 330 manned operator days per year, and will continue to remotely operate as many instruments as possible. We continue to publish research papers in peer-reviewed journals and to make numerous presentations at national and international conferences and workshops and are members of multiple-nation Arctic research coordination efforts such as the Sustaining Arctic Observing Network and the International Arctic Systems of Observing the Atmosphere. CANDAC continues to offer resources for teachers available on our website as well as continuing to participate in teacher training conferences and science outreach events for students.

Hope Bay Belt Project Scientific Research

License Number: 04 028 22R-M

Principal Investigator: Duquet Harvey, Nancy

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Number in Party: 10

Research Locations: Hope Bay Belt

SUMMARY

Agnico Eagle at Hope Bay (Agnico) is requesting a three-year renewal of the Hope Bay Belt Project Land and Water Scientific Research Licence for the continuation of both compliance and baseline monitoring throughout the Hope Bay Belt (“Belt”). The Hope Bay Belt is a north-south oriented mineralized zone approximately 100 km long and 20 km wide located near Hope Bay, Melville Sound, Nunavut. TMAC’s Hope Bay Project includes the permitted Doris Project (“Doris”; Nunavut Impact Review Board Amended Project Certificate No.003; Type A Water Licence 2AM-DOH1323) as well as the Boston and Madrid deposits which are currently in the exploration phase permitted under existing Type B Water Licences 2BB-BOS1217 and 2BE-HOP1222. A comprehensive range of data collection supporting the project certificate and licences will continue to be conducted in fulfillment of compliance and monitoring requirements. This work is a continuation of that evaluated and conducted previously (NIRB file number of 09YN022; NRI Scientific Research Licence # 04 027 19R-M) and will continue to support information utilized for compliance and baseline information.

Weather, ice, ocean, and freshwater measurements to understand greenhouse gas cycles and aquatic ecosystems

License Number: 04 010 22R-M

Principal Investigator: Else, Brent

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Number in Party: 12

Research Locations: Cambridge Bay Surrounding Area

SUMMARY

This project tries to understand how greenhouse gases move through the Arctic environment. Greenhouse gases are the cause of climate change, and most people know that humans make them when we do things like drive cars or heat our homes. But greenhouse gases are also a natural part of ecosystems. One important place to find natural greenhouse gases like methane and carbon dioxide is in freshwater and seawater, where they exist as dissolved gases. CO₂ and CH₄ are important parts of these ecosystems because some organisms that live in the water make these gases, while others use them. For example, algae and other plants take CO₂ out of the water to make oxygen, while certain types of bacteria use up oxygen and make CH₄. A second objective of this project is to find ways to make our science useful to Northern communities. We have been able to do this in the past. For example, we measure greenhouse gases at weather stations, and so we have worked with the HTO to set up weather stations at important locations. Data from those weather stations can be accessed online, and used when traveling.

Iqaluit Community Fisher Baseline Ocean Data Collection Program

License Number: 01 036 22Registry

Principal Investigator: Flaherty, Alexander

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Number in Party: 8

Research Locations: Frobisher Bay

SUMMARY

The project aims to collect a baseline of oceanographic data such that a greater understanding of the seasonal dynamic of water exchange in Frobisher Bay can be established. This project hopes to expand to longer-term monitoring such that it can begin to help understand the longer-term fluctuations and changes in the region. Baseline data is meant to be applicable to a wide range of research activities and this project is designed to support answering a number of current and future research questions that the community of Iqaluit may be interested in addressing.

Transmit Array Antenna Farm

License Number: 02 041 22R-M

Principal Investigator: Foley, Holly

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Number in Party: 2

Research Locations: Eureka

SUMMARY

This project will conduct measurements of the polar ionosphere. In order to do this, this project will build a 16 by 16 transmit antenna array comprised of 30 foot monopoles (Phase 3 – footprint is 120 m by 120 m). This will expand on the 8 by 8 antenna array that is already at the Eureka site (Phase 2 – footprint is 60 m by 60 m). Other than surveying the locations to set ground plates for holding the antennas, no ground preparation is required. Each antenna will be held vertically using straps connected to four 75 cm long guy anchors that are driven into the soil.

Reconstructing ancient sea level and seafloor conditions in the 1.9-billion-year-old rocknest formation

License Number: 04 025 22N-M

Principal Investigator: Geyman, Emily

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Number in Party: 3

Research Locations: Eokuk Lake Region

SUMMARY

Studying ancient climate and sea level change on Earth can help us make better predictions of future climate change. It is still poorly known when in Earth's 4.5-billion-year history was Earth covered in ice, and when was Earth warm and ice-free. Understanding when Earth had ice, and how it transitioned between cold and warm states, holds important information about Earth's climate system that can inform our mitigation strategies for future climate change.

Diversity of pelagic primary producers in coastal habitats and the potential for harmful blooms in Eastern Canadian Arctic, with a focus near Iqaluit, Nunavut

License Number: 01 022 22R-M

Principal Investigator: Gosselin, Michel

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Number in Party: 5

Research Locations: Iqaluit (Koojesse Inlet, Tarr Inlet, Peterhead Inlet)

SUMMARY

The long-term objective for the overall project is to collect baseline biodiversity data on phytoplankton to characterize the current state of the nearshore ecosystem near Iqaluit, specifically Koojesse, Peterhead and Tarr inlets. As part of the implementation of the Oceans Protection Plan of Fisheries and Oceans Canada (DFO), data collected will contribute to the creation of a larger, more comprehensive database containing information on the current and historical distribution of phytoplankton species in the Canadian Arctic. This database will help in determining the status (i.e., native or invasive, new to the region) and the potential origin of novel phytoplankton species in Frobisher Bay. Such information can be used to survey, detect and mitigate introductions of new or harmful phytoplankton species in the Frobisher Bay region and in other future ports with high shipping activity.

Response of nitrogen fixation in lichens and bryophytes to a rapidly changing Arctic environment

License Number: 01 035 22N-A

Principal Investigator: Hagge, Perrin

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Number in Party: 3

Research Locations: North & South Qikiqtani, Kivalliq, Kitikmeot

SUMMARY

Amplification of global warming in the Arctic is particularly alarming owing to the vulnerability of the wildlife and inhabitants that are dependent on a stable and predictable environment for their life and livelihoods. The Arctic region is known to have an oversized role in climate regulation due to destabilizing feedbacks. It is therefore imperative that we understand the factors affecting carbon cycling and storage in Arctic environments. The third report by the UN Intergovernmental Panel on Climate Change suggested that the terrestrial biosphere could store anywhere between 22 and 57 percent of expected anthropogenic carbon emissions by 2100. However, preliminary calculations suggest this would require additional bioavailable nitrogen. This study aims to characterize the main drivers of biological nitrogen fixation (BNF) and how they respond to environmental forcings to better refine current climate models that forecast how climate change will affect Arctic ecosystems. This project will collect lichen, bryophyte (moss, liverwort and hornwort) and soil samples from sites along the path of the French ecotourism ship *Le Commandant Charcot* during a cruise through the Northwest Passage from Iceland to Alaska. The project will be carried out opportunistically by Nicolas Cassar (PI), Ariana Desouza and Perrin Hagge (the proponent). This project builds on the work of Dr. Charles Umbanhowar (NPC Application #149750), who at the time of our cruise will have collected samples for us in mid-July from field sites in south Baffin Island.

Past climate reconstruction using annually-layered carbonate buildups on the Nunavut shallow seafloor

License Number: 02 040 22R-M

Principal Investigator: Halfar, Jochen

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Number in Party: 4

Research Locations: SE Ellesmere Island

SUMMARY

Climate data in the Canadian Arctic prior to the beginning of instrumental observations in the 20th century is sparse. Hence, at present we do not have a good understanding of ocean temperature and sea ice evolution during the past centuries. During our cruise we will collect small carbonate (limestone) mounds on the shallow seafloor of Arctic Bay, Nunavut. These mounds contain annual bands and can form on the seafloor for hundreds of years, hence, allowing a reconstruction of Arctic climate several centuries back. Using the small vessel Vagabond we will collect mounds using SCUBA at water depths of 15-20m along SE Ellesmere Island. Mounds are generally 3-8 centimeters in diameter, up to 3 centimeters high, and can be removed from rocky seafloor using a small hammer and chisel. At each site we plan to remove 20 mounds, which are structures made up entirely of inorganic calcium carbonate that were originally formed by an underwater alga. The mounds will be analyzed for their amount of yearly growth and element composition in the laboratory, which will provide data for long time series of sea surface temperature and past sea ice reconstructions. Ultimately, the published results are expected to be integrated into climate models.

Clyde River small craft harbour development

License Number: 02 008 22R-M

Principal Investigator: Hardwick, Loretta

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Number in Party: 11

Research Locations: Clyde River

SUMMARY

CBCL-Canadrill has been retained by Fisheries and Oceans Canada - Small Craft Harbours (DFO-SCH) for the Clyde River Harbour Development, which is for the design and construction of a small craft harbour. To execute this, it is essential to understand the existing site conditions to support the engineering design. The existing NPC permit (NPC File No. 149159) and NIRB screening was approved in 2019 for the feasibility studies of four small craft harbours in Arctic Bay, Clyde River, Resolute Bay, and Grise Fiord; the scope of this work included field studies of marine, wildlife, vegetation, geoscience, geophysics, and archaeology. It was then extended in 2020 for an additional marine field program. In the spring of 2021, a geotechnical drilling program and environmental assessment sampling program is intended to build on the information that was gathered during the previous two field programs. There are no anticipated changes to the potential effects (marine or terrestrial) in the upcoming program. The study areas will include the future harbour basin and near shore area.

CoMet 2.0 Arctic

License Number: 05 12 22N-A

Principal Investigator: Hausold, Andreanne

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Number in Party: 40

Research Locations: Nunavut Airspace

SUMMARY

CoMet 2.0 is a research flight campaign conducted by the German Aerospace Center (DLR) and a number of other German research institutes. Contact was established with different Canadian science teams for cooperation and data exchange. DLR owns and operates the research aircraft HALO (high altitude and long range aircraft) which will be equipped with instruments provided by the research teams. We have approximately 100 flight hours available for research flights. With a typical flight duration of 8-9 hours we will do approximately 12 flights during a 6-week period. The overarching goal of the CoMet 2.0 Arctic mission is to provide measurements of the most important greenhouse gases CO₂ and CH₄ from Arctic regions. This will be done using a suite of sophisticated scientific remote sensing and in-situ instruments onboard the German research aircraft HALO. This data will support state-of-the-art Earth system models and will increase our understanding of climate change at a regional level in the Arctic boreal region. At the same time, CoMet 2.0 also intends to support and improve current and future satellite missions to monitor climate change. The results shall help to better predict future effects on ecosystems and allow policymakers to make informed, fact-based decisions.

Community-based monitoring of sea ice and eider duck populations around the Belcher Islands, Nunavut

License Number: 01 001 22R-M

Principal Investigator: Heath, Joel

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Number in Party: 4

Research Locations: Belcher Islands

SUMMARY

This project has been providing significant capacity building for community-driven research in Sanikiluaq addressing major long outstanding gaps related to changing wildlife populations, oceanography and sea ice. The program has helped provide the first baseline data demonstrating the large-scale impact of changing oceanography in the region providing a basis for future research and monitoring. Additionally, the project is contributing to development of a novel approach to meaningfully incorporating Inuit knowledge and observations through the SIKU platform and mobile app. The program contributes to development of long-term research and monitoring for the region that will have a lasting positive impact as the community moves forward with further development of these programs and establishing long-term protection and conservation measures for the region.

Marine acoustic monitoring in Ninginganiq NWA

License Number: 02 023 22N-M

Principal Investigator: Hogan, Danica

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Number in Party: 4

Research Locations: Ninginganiq NWA (Isabella Bay)

SUMMARY

The goal of this project is to address Ninginganiq NWA Management Plan monitoring priorities by deploying a passive marine acoustic recorder in Ninginganiq NWA in order to collect information about vocal marine animals and vessel noise in the NWA. We will use the results of this study to update the list of marine mammals that use the area, provide insight into timing of use of the area by bowhead whales and other marine animals, establish baseline noise levels in the NWA, and assess how noise pollution from vessel traffic may affect marine mammals in Ninginganiq NWA. This information will be used to guide permitting decisions regarding vessels in the NWA, identify areas for improvement of compliance promotion activities, and create standard permit conditions for vessels entering the NWA for tourism and other purposes.

Mary River Project

License Number: 02 030 22R-M

Principal Investigator: Hoyle, Megan-Lord

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Number in Party: 49

Research Locations: Steensby Port, Mary River, Milne Port/Road

SUMMARY

Environmental data collection and analysis for monitoring and management of the Mary River project as prescribed by Project Certificate No. 005 – Amendment 3 and Type “A” Water Licence No. 2AM-MRY1325 – Amendment 1.

Science and Indigenous partnerships in action: Mobilizing Indigenous knowledge and building capacity to participate in research during the implementation of an ecosystem approach to fisheries resource assessments

License Number: 01 018 22R-M

Principal Investigator: Jawanda, Jesslene

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Number in Party: 4

Research Locations: Kinngait, Sanirajak, Igloolik, Sanikiluaq

SUMMARY

During this study, the RV Ludy Pudluk, a newly constructed purpose-built fisheries research vessel owned by the Qikiqtaaluk Corporation, and community-supplied support vessels from the four study communities of Kinngait, Sanikiluaq, Sanirajak, and Igloolik will work in concert in waters adjacent to each community to determine the fishery potential of marine resources. Sharing of knowledge and capacity building among Indigenous community members and researchers from the Fisheries and Marine Institute of Memorial University will occur during data collection associated with ecosystem-based resource assessments and development of a variety of fishing gears designed to meet the needs of Nunavut small boat harvesters.

Atmospheric sciences and terrestrial ecosystem studies in Victoria Island

License Number: 04 021 21R-M

Principal Investigator: Jung, Ji Young

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Number in Party: 13

Research Locations: Cambridge Bay, Grenier Lake

SUMMARY

Climate change will affect our lives not only in the Arctic region but also around the globe. The Arctic ecosystem is particularly sensitive to climate change. Moreover, greenhouse gases released from the enormous reservoir of soil carbon in permafrost into the atmosphere could have a profound effect on the global climate. Thus, we aim to understand 1) how much greenhouse gas is exchanged between the atmosphere and permafrost and 2) how terrestrial ecosystem structure and processes change under future climate scenarios.

Evaluation of multidrug-resistant bacteria in the active soil layer and permafrost regions of the Canadian High Arctic

License Number: 04 029 22N-A

Principal Investigator: Krishnan, K.P.

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Number in Party: 2

Research Locations: North Cambridge Bay

SUMMARY

One of the most noticeable impacts of Arctic warming is the thawing of permafrost – which could potentially reactivate many of the dormant microorganisms that have been preserved in the permafrost soils for centuries. Some of these microorganisms may be pathogenic and/or antibiotic-resistant bacteria (ARB) that can lead to the resurgence of zoonotic diseases. Besides, antibiotic resistance genes (ARG) can be transported to the Arctic environment through the migration and movement of humans and birds. Since ARGs are now widespread among microbial communities, whether the extensive diversity of ARGs and ARB in environmental reservoirs is the result of anthropogenic influence is controversial. Thus, in this proposal, we intend to perform a comprehensive survey of the tundra soil, active layer, and permafrost not only to evaluate the presence of potential ARG and ARB using a culture-dependent and independent approach but also to delineate potential sources-anthropogenic and/or ancient origins of ARGs and ARB in the Canadian high Arctic region. Thus, our proposed project will provide baseline data on the ARGs and ARB which could be utilized to demarcate the high-risk permafrost regions for the local population.

Community-driven sea ice and ocean research in the contrasting coastal domains of Hudson Bay

License Number: 03 005 22R-M

Principal Investigator: Kuzyk, Zou Zou

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Number in Party: 8

Research Locations: Marine Environment between the communities of
Chesterfield Inlet and Naujaat

SUMMARY

The objective of this project is to expand the highly successful community-driven research in eastern Hudson Bay to northwest Hudson Bay (Chesterfield Inlet and Naujaat), with a goal towards establishing comparison sites in eastern and western Hudson Bay. This comparison will support bay-wide monitoring objectives, promote inter-jurisdictional information exchange, and help test scientific hypotheses about contrasting oceanography and marine life between northwest and southeast Hudson Bay.

Ensuring water security in the High Arctic: Understanding the impacts of changing permafrost and hydrology

License Number: 02 006 22R-M

Principal Investigator: Lafreniere, Melissa

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Number in Party: 8

Research Locations: Resolute Bay area

SUMMARY

The primary goal of this research is therefore to investigate water and ecosystem sensitivities associated with climate and permafrost change near Resolute Bay. This research involves three key objectives: i) to develop a water and permafrost baseline dataset for the Resolute vicinity to support decision making; (ii) to characterize the levels of suspended sediment and other dissolved water quality parameters (salt, nutrients, organic matter, dissolved metals) in rivers and lakes of importance to the community of Resolute; and (iii) to determine how changing climate and permafrost conditions are likely to impact water quality and potentially impact drinking water and aquatic ecosystems.

Cape Bounty Arctic Hydrological Observatory (CBAWO) Melville Island, Nunavut

License Number: April 14,2023

Principal Investigator: Lamoureux, Scott

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Number in Party: 12

Research Locations: Cape Bounty

SUMMARY

Our work is intended to determine how climate change affects the land and water. Our work involves obtaining water and sediment samples from the streams and lakes at Cape Bounty and determining how vegetation changes with climate. We also study permafrost and the effects it has on water and land. This study is the longest record of changes in rivers and lakes in Nunavut and will be useful for understanding how water and the land will respond to climate and permafrost change, and the potential effects on wildlife and vegetation. We have been doing this work since 2003 and hope to continue in the future.

NASA Arctic-Boreal Vulnerability Experiment (ABoVE) Airborne 2022 Initiative

License Number: 03 015 22R-M

Principal Investigator: Larson, Libby

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Number in Party: 3

Research Locations: Flight Paths Kivalliq, Kitikmeot

SUMMARY

The Arctic-Boreal Vulnerability Experiment (ABoVE) is a NASA field research initiative focused on Alaska and western Canada that has been underway since 2015. The Terrestrial Ecology Program from NASA HQ is funding research at multiple institutions to investigate the impacts of environmental change on terrestrial and freshwater ecosystems in arctic and boreal regions, to enhance understanding of the vulnerability and resilience of these ecosystems and how people within and beyond this region are responding to change. The airborne component of this research consists of flying aircraft with specialized sensors over parts of the region while teams on the ground collect data. In this way, we can better interpret the data from aircraft and satellites, allowing for scaling up the knowledge gained from local field studies to regional and pan-Arctic scales.

Izok Lake targeted VMS mineralization in the Slave Region

License Number: 04 023 22N-A

Principal Investigator: Lebeau, Lorraine

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Number in Party: 4

Research Locations: Izok Lake Camp, Hood Property, Izok Lake Property, Gondor Property

SUMMARY

A substantial amount of drill core has been left on the Izok Lake property that is available for observation. This project involves core logging of mineralized zones that will build on previous years of bedrock mapping projects in the greenstone belt, in which the Izok Lake deposit is hosted in, from the Northwest Territories Geological survey (NTGS), and will act as a baseline for VMS mineralization in greenstone belts of the Slave craton in Nunavut. This work will help evaluate the tectonic setting, volcanic architecture, and facies distribution in volcanogenic massive sulfide (VMS) deposits within the belt and surrounding areas (e.g., Hood, and Gondor VMS properties). Understanding the fundamental geological processes of the greenstone belt will aid in the understanding of the evolutionary processes responsible for mineral endowment across the Slave craton. In addition, this work will assist in the scientific understanding of those involved in policy decisions, including local stakeholders. This work will also build on 3D inversions completed following a 65,000 line-km high-resolution aeromagnetic survey that was flown in 2019 that has provided for the first time detailed magnetic data of this greenstone belt and surrounding granitoid basement complex. Other longer-term objectives are to publish a journal article or report from the interpretations of the data collected, and to present results at local and possibly international conferences.

Geological mapping and study of hydrothermal deposits and gossans near Expedition Fiord, Axel Heiberg Island, Nunavut as analogues for Mars

License Number: 02 038 22N-A

Principal Investigator: Lemelin, Myriam

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Number in Party: 7

Research Locations: Axel Heiberg Island

SUMMARY

Gossans are surficial deposits that form through the chemical and physical weathering of bedrock. They can be preserved for thousands of years in the permafrost. In the Expedition Fiord area of Axel Heiberg Island, Nunavut, gossans are associated with ancient hydrothermal deposits that contain minerals also found on Mars. These minerals can preserve traces of microbial life but the way they formed is still unknown. Importantly, gossans in the Expedition Fiord area could be part of a network of fractures through which hydrothermal fluids have been circulating for millions of years. It is possible that these gossans have been formed through the interaction between the metal-rich bedrock and ancient deposits formed in a hydrothermal system. If such, this would have important implications in the search for life on Mars. It is highly probable that hydrothermal systems were active on Mars billions of years ago. These systems are key places to look for signs of ancient microbial life on Mars. Our main objective is to study gossans in the Expedition Fiord area as indicators of ancient hydrothermal systems on Mars at various spatial scales in the context of current and future Mars exploration missions. The specific objectives are as follows: 1. Map the Expedition Fiord area and detect gossans using satellite imagery. 2. Investigate the spectral signature, composition, and potential biosignatures in the gossans and hydrothermal deposits. 3. Conduct detailed spectroscopic, compositional, and biological studies on the returned samples in our university laboratories.

Defence Research and Development Canada (DRDC) Gascoyne Inlet

License Number: 02 036 22R-M

Principal Investigator: MacNeil, Erin

Affiliation: Defense Research & Development Canada
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Number in Party: 12

Research Locations: Gascoyne Inlet, Devon Island

SUMMARY

The DRDC Northern Watch Technology Demonstration Project (TDP) – Canadian Arctic Underwater Sentinel Experimentation (CAUSE) will demonstrate an Arctic maritime surveillance capability to the Department of National Defence and other concerned federal departments. Commencing in 2008, this multi-year undertaking is based at Gascoyne Inlet. The surveillance demonstration system is unmanned, semi-autonomous, and remotely controlled through a satellite system connection from one of the DRDC centres. This information is being submitted on behalf of Defence Research and Development Canada (DRDC Atlantic).

Defence Research and Development Canada (DRDC) Gascoyne Inlet

License Number: 02 049 22N-M

Principal Investigator: MacNeil, Erin

Affiliation:

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Number in Party: 8

Research Locations: Gascoyne Inlet, various locations on Baffin Bay and Lancaster Sound, Arctic Bay, Qikiqtarjuaq, Pond Inlet

SUMMARY

The research project will involve four scientific activities and experiments:

1. Arctic Acoustic Recorders (AAR) trial. The AAR trial will deploy underwater acoustic recorders in three locations in Lancaster Sound and Baffin Bay (near Arctic Bay, Pond Inlet, and Qikiqtarjuaq) during the period of 23 August to 1 September 2022.
2. Maritime Autonomous and Remotely Piloted Systems (MARPS). This trial will be undertaken in shallow water near Pond Inlet, NU.
3. Towed Reelable Active/Passive Sonar (TRAPS) and Arctic Behavioural Response (ABR). Whales will be tagged with suction cup tags that can be programmed to pop off after 8 to 24 hours. A controlled exposure experiment will be performed, and behaviour of the whales will be observed.
4. Long-Range Underwater Acoustic Communication Experiment (LRAT) - This experiment will take place with the participation of the HMCS Goose Bay (GBY) vessel that will deploy both transmitter and recorders. The trial hopes to extend the range of communications underwater. An acoustic projector will transmit at low power for 1 hour every 2-3 hours for about 18 to 20 hours per day for about 2.5 days. Sound will be recorded on stationary recorders.

2022 Nunavut Small Craft Harbour Field Program

License Number: 03 013 22N-M

Principal Investigator: McDermid, Chris

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Number in Party: 8

Research Locations: Coral Harbour, Sanikiluaq, Naujaat, Chesterfield Inlet

SUMMARY

Worley Canada Services Ltd. and Ikpiaryuk Services Ltd. in joint venture, operating as Advisian-Ikpiaryuk JV, have been retained by Public Services and Procurement Canada and Fisheries and Oceans Canada – Small Craft Harbours (DFO-SCH) to conduct an engineering feasibility study for the construction of small craft harbours (SCH) in four communities in Nunavut: Sanikiluaq, Coral Harbour, Naujaat, and Chesterfield Inlet (the Project). To inform the engineering and environmental deliverables for the Project, a field program will be required which is planned for the open-water season of 2022. The field program will focus on environmental, geoscience, geophysics, and archaeological baseline studies in each location. A future drilling program will be undertaken in each of the communities at the detailed design phase of the Project, which is also described. Sanikiluaq is located within the Qikiqtaaluk Region, while Coral Harbour, Naujaat and Chesterfield Inlet are located within the Kivalliq Region. The field program will be undertaken in July or August 2022, with timing dependent on open-water ocean conditions and thus dependent on the timing of ice break up. At this time, there are three field days planned in each location, with one day of travel between sites.

Arctic Bay harbour development

License Number: 02 007 22R-M

Principal Investigator: McEwan, Eleanor

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Number in Party: 4

Research Locations: Arctic Bay

SUMMARY

Worley Canada Services Ltd. and Ikpiaryuk Services Ltd. in joint venture, operating as Advisian-Ikpiaryuk JV, have been retained by Public Services and Procurement Canada (PSPC) and Fisheries and Oceans Canada – Small Craft Harbours (DFO-SCH) to perform community consultation, regulatory support services, and detailed design for the development of a small craft harbour (SCH) in the Hamlet of Arctic Bay, Nunavut (the Project). This harbour is part of the Inuit Impact and Benefit Agreement (IIBA) (IIBA 2019) negotiated for the Tallurutiup Imanga (TI) (Lancaster Sound) National Marine Conservation Area (NMCA), which was announced on August 1, 2019. Arctic Bay is located within the North Baffin Regional Land Use Plan (NBRLUP) Region (NPC 2000) on the northwest coast of Baffin Island (Borden Peninsula) (73° 1.529'N, 85° 7.203'W).

Polar Knowledge Canada (POLAR) Camp on Greiner Lake, Cambridge Bay

License Number: 04 024 22R-M

Principal Investigator: McLennan, Donald

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Number in Party: 5

Research Locations: Cambridge Bay, Grenier Lake

SUMMARY

In the winter months of early 2021, the two structures of the POLAR camp will serve as emergency shelters for both POLAR staff, and Cambridge Bay community members. Depending on COVID-19-related guidelines and restrictions, starting in May 2021, the POLAR camp will be prepared for the start of the summer field season by checking and fixing the possible damage to the existing structures that may have occurred during the winter. In June 2021, the summer field season activity will start in the camp. All-season individual tents will be installed in the camp. POLAR will continue a range of field research activities, and if allowed to Nunavut, a number of visiting research scientists, their graduate students, as well as northern students will come to Cambridge Bay to conduct this research. Most of these research activities, as well as the deployed scientific instrumentation are on the northern shore of Greiner Lake in the IMA. For safety and convenience, some researchers will be stationed in the camp near these research and monitoring sites. Measures will be taken to mitigate the risk presented by barren-ground grizzly bears in the camp, such as keeping food and garbage away from camp, and erecting bear fences. The POLAR research projects include: tundra ecosystem description and mapping, arthropod monitoring, freshwater lake surveys, as well as maintenance and deployment of research instruments such as a weather station, frost tubes and thermistor arrays, river gauging stations, and eddy covariance towers. Researchers will come and go over the summer; there will be no more than 10 people in camp at any one time. Normal occupancy will be 4–5 people.

SuperDARN Radar Sites

License Number: 02 016 22R-M

Principal Investigator: McWilliams, Kathryn

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Number in Party: 4

Research Locations: Clyde River, Rankin Inlet

SUMMARY

Super Dual Auroral Radar Network (SuperDARN) Canada is a network of high-frequency (HF) radars located throughout the northern hemisphere. The purpose of the SuperDARN is to study plasma in the near-Earth space system, its interaction with the Earth's atmosphere and geospace environment, its effects on the terrestrial "hard" infrastructure (e.g., communications, energy, transportation, etc...), and its role in the Sun-Earth system. SuperDARN convection/voltage maps are essential for studies of the impact of space weather at Earth. Space weather researchers rely on SuperDARN data for putting their localized observations in context. SuperDARN radars are extremely reliable, being easily accessible for repairs and upgrades. This reputation has made SuperDARN a favourite tool for space weather scientists.

Water resource assessment for Coral Harbour

License Number: 03 011 22N-A

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Number in Party: 4

Research Locations: Coral Harbour

SUMMARY

Water supply for Coral Harbour, Nunavut is sourced from a river-fed reservoir. There have been instances of high electrical conductivity, which raises concerns regarding saltwater intrusion from Hudson Bay. A team (Dr. Barret Kurylyk and Dr. Julia Guimond) from the Dalhousie Coastal Hydrology Lab plans to conduct a reconnaissance field campaign to characterise the river hydrodynamics and to investigate potential sources and pathways for saltwater, including via the river, the shallow subsurface, and sea spray. The team will use non-invasive instruments to investigate the interactions between the bay and the river and to assess potential subsurface salinity dynamics. Loggers will be placed along the river to measure water level, salinity, and temperature, which will provide new understanding on coastal zone mixing in the river. Geophysical instruments will be used to measure the ground electrical resistivity to map where there are saltwater (low resistivity) and freshwater (high resistivity) zones. Surveys will be taken along the coastline and the riverbanks. Water samples will be collected to transport back to Halifax to assess the water chemistry and to fingerprint salt sources. Sensors may be used to measure total dissolved solids, dissolved oxygen, and other water quality parameters in the river. Collectively, these data will reveal the tidal dynamics in the river and help identify potential mechanisms for drinking water salinization. The first trip will be in early July (e.g., 5 days in Coral Harbour), and a potential follow-up trip will likely be undertaken later in the summer (late July to early August). Results will be shared with and interpreted for the community and territory as desired.

Community-based study of under-ice benthic assemblages in the Arctic (BenthArctic)

License Number: 01 032 22N-A

Principal Investigator: Mercier, Annie

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Number in Party: 5

Research Locations: Sanikiluaq, Grise Fiord

SUMMARY

The proposed project builds on interest expressed by Inuit communities in Nunavut to assess the status and value of their marine benthic resources and prospects for their sustainable use in the context of food security and climate change. It aims to expand our understanding of nearshore benthic assemblages, with a focus on winter-spring processes occurring at sea-ice edges and on species of relevance to commercial and subsistence fisheries. Interlinked objectives will be dedicated to fundamental research, practical knowledge transfer and community mobilization. Field work is expected to take place in the summer/fall of 2022 and the winter/spring of 2023. The approach centers on the use of a portable remotely operated vehicle (ROV) deployed through holes in the sea ice to investigate the benthic community structure and diversity in two regions (Low vs High Arctic, specifically Sanikiluaq and Grise Fiord). The ROV will have minimal environmental impact; it will capture videos of the benthos and collect a few water, sediment and biological samples for analysis. Videos will be used for scientific analyses and to create education material; they will be shared with end users in the two localities. A complementary segment will assess methods best adapted for the collection and handling of key commercial species.

Amundsen Science annual expedition onboard the Canadian research icebreaker CCGS Amundsen

License Number: 05 015 22R-M

Principal Investigator: Merzouk, Anissa

Affiliation: Amundsen Science
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Number in Party: 42

Research Locations: Baffin Bay, Frobisher Bay, Lancaster Sound, NW Passage, Hudson Bay & Strait

SUMMARY

The objective of the annual scientific expedition of the Canadian research icebreaker CCGS Amundsen is to assess the changes occurring in the marine ecosystems of the Canadian Arctic in response to climate change. Since 2003, the Amundsen has sailed the Canadian Arctic in support of over 45 Canadian and international research programs and dozens of multidisciplinary science teams. The annual expeditions generally comprise of the following research components: 1) atmosphere and ocean climate; 2) sea ice and glaciers; 3) marine resources and environment; and 4) geology and bathymetry. The planned activities include both ship-based sampling of the marine environment and land-based sampling of rivers, shores and glaciers, and encompass all of Nunavut's marine areas, including Baffin Bay, Lancaster Sound, the Northwest Passage (including the Tallurutiup Imanga National Marine Conservation Area), Foxe Basin, Hudson Bay and Hudson Strait.

MAP (Multidisciplinary Arctic Program)-Last Ice

License Number: 02 022 22R-M

Principal Investigator: Michel, Christine

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Number in Party: 7

Research Locations: Queen Elizabeth Islands

SUMMARY

This project studies the sea ice of the Canadian Archipelago, to understand the impacts of climate change on the marine ecosystem. This is important since many Arctic species depend on sea ice. The study will take place on the sea ice in the High Arctic Archipelago, during the spring of 2022, from end of April to end of May. We will access sampling sites on the sea ice by snowmobile or helicopter. At each station, we use a small instrument (CTD) to measure water temperature and salinity. We then collect three ice cores and collect the bottom of the cores where small algae are found. We will also collect water samples to measure small plants (phytoplankton) present in the water and their food. At the end of our sampling, we replace the ice cores in their original location, leaving very little trace of our activities on the site. We are not installing a shelter on the ice as we plan to spend less than 2 h at station. In this project, we plan to collect organisms at the bottom to answer questions raised by community members during community consultations in December 2021. Nunavut residents are important members of our team and we anticipate to have 1 or 2 community members in this year's project. We will also plan outreach and hands-on activities at the school in Resolute Bay and in the field. Results of the project are shared through NRI and HTA reports, outreach products, and community consultations. Data are made accessible via the Government of Canada Open Access Portal. The results of this study inform Tuvaijuittuq and help understand the important role of sea ice in the Arctic marine ecosystem.

Ancient DNA in Lake Sediment

License Number: 02 027 22R-M

Principal Investigator: Miller, Gifford

Affiliation: INSTAAR & Geological Sciences
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Number in Party: 7

Research Locations: Areas around Clyde River, Iqaluit, Qikiqtarjuaq and Pond Inlet

SUMMARY

This fieldwork builds on a project initiated in 2018, titled Ancient DNA in lake sediment. The primary goal of this research is to analyze ancient DNA contained in lake sediment in order to reconstruct past vegetation changes on Baffin Island over the last ~10,000 years and assess how plant communities responded to past climate change. Ancient DNA in lake sediment is a powerful new tool in paleoecology that seems to work particularly well in the Canadian Arctic because of the cold temperatures that provide favorable conditions for preservation and because DNA provides a comprehensive picture of flora growing within a lake catchment. Our goal this year is to complete the fieldwork required for the project. This requires us to sample a lake on Padloping Island south of Qikiqtarjuaq first, with the assistance of two bear guards we will hire from Qikiqtarjuaq.

Barnes Ice Cap disappearing

License Number: 02 028 22R-M

Principal Investigator: Miller, Gifford

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Number in Party: 7

Research Locations: Barnes Ice Cap

SUMMARY

The Barnes Ice Cap is the final remnant of the giant Laurentide Ice Sheet that covered most of Canada during the last Ice Age. It has been stable for the past 3000 years but is now melting at all elevations in the face of increasing summer warmth. Even with no additional warmth, we project its disappearance within a few hundred years. The goal of our research is to determine whether the Barnes Ice Cap disappeared during earlier interglacials, or whether its disappearance is unprecedented in more than two million years. To address this question, we will take small rock cores of bedrock at the margin of the current ice cap and analyze those rock cores for unusual nuclides that would have been created if the ice cap had disappeared in the past.

Cambridge Bay Ocean Observatory

License Number: 04 004 22R-M

Principal Investigator: Moran, Kate

Affiliation: Ocean Networks Canada
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Number in Party: 7

Research Locations: Cambridge Bay

SUMMARY

Underwater sensors and a camera provide continuous information on seawater properties, ice thickness and marine organism activity. Data from the underwater instruments and the weather station are transmitted by a WiFi link to a server in the Nunavut Government building, where data are transmitted via satellite to our ONC data centre at the University of Victoria and made available to all. We also plan to collect seawater and mud samples in the vicinity of the platform, to calibrate our instruments. We would also need to collect specimens of seafloor life (invertebrates) around the platform, so that our experts can identify the species we are observing.

Arctic coastal and drifting ice processes and dynamics

License Number: 02 02 122R-M

Principal Investigator: Mueller, Derek

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Number in Party: 10

Research Locations: Queen Elizabeth Islands, Baffin Island

SUMMARY

Changes in Arctic climate have profound implications for the break-up of coastal ice. In the recent past, there have been large calving events of ice shelves and glaciers that have produced many vast ice islands and icebergs that drift through Nunavut waters. Our research is focused on understanding how various types of coastal ice interact with the atmosphere above, the ocean below as well as meltwater and glacier ice from the adjacent land. In particular, we are interested in how both thick ice (ice tongues, ice shelves) and thin ice (landfast sea ice and lake ice) are melting and breaking-up in a changing climate. In addition, we study how large ice masses (icebergs and ice islands) that break away from the coast, drift and deteriorate.

Churchill Marine Observatory - Environmental Observing (CMO-EO) System

License Number: 03 007 22R-M

Principal Investigator: Mundy, CJ

Affiliation: University of Manitoba
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Number in Party: 14

Research Locations: Shorelines of West Hudson Bay, Hudson Strait & Foxe Basin

SUMMARY

All work was carried out under the multiyear NRI License number, 03 009 21R-M. In total, 7 oceanographic moorings (one split into two separate anchors) were deployed along the shipping lane in central Hudson Bay and within James Bay as originally stated for last year's renewal request for NRI 03 009 20R-M. Additionally, we collected oceanographic samples and sensor data along southern Hudson Bay and within James Bay. As data becomes available it will be housed at U. Manitoba within the Canadian Watershed Information Network (CanWIN) (<http://lwbi.cc.umanitoba.ca/>) and made publicly accessible. This year we are requesting renewal of the multiyear licence, NRI 03 009 21R-M, to turn over the 2 CMO-EO moorings along the shipping lanes in Hudson Bay, carry out Year 2 of the JBE including the retrieval of 5 moorings deployed in James Bay, undertake a new oceanographic project around the Belcher Islands, Nunavut, including deployment of 2 oceanographic moorings and a DFO-Oceans North based project close by Churchill, Manitoba.

Reducing risk to coastal communities and offshore infrastructure caused by marine geohazards

License Number: 02 046 22R-M

Principal Investigator: Normandeau, Alexandre

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Number in Party: 3

Research Locations: Jones Sound, Glacier Strait, Baffin Bay (Grise Fiord)

SUMMARY

The proposed research expedition would take place in and around the community of Grise Fiord. The major goals of this proposed research for 2022 would be: (1) To investigate the stability of the seabed in fjords near Grise Fiord. New imagery of the seabed shows that submarine landslides have occurred in several locations. Baffin Bay experiences a number of earthquakes and iceberg groundings which can trigger submarine landslides. Our research will help to determine the risk for a large submarine landslide happening in the future; and (2) Coring and mapping of coastal environments would allow us to collect evidence of past tsunamis affecting the shoreline, similar to the 2017 Greenland tsunami. In addition, digging in coastal areas may take place using shovels to observe if tsunamis have occurred in the past near the villages. During this type of expedition, we typically collect seabed sediment samples (2 m long gravity cores), seafloor photographs and video, information about the shape of the seabed, and sub-bottom imaging. These instruments will be the same as those used during the 2013, 2018 and 2019 expeditions. The research would take place onboard the Government of Nunavut vessel Nuliajuk. If this project is accepted, the research ship is available in August or September.

Western Hudson Bay geoscience for infrastructure

License Number: 03 003 22R-M

Principal Investigator: Oldenborger, Greg

Affiliation: Natural Resources Canada
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Number in Party: 2

Research Locations: Rankin Inlet

SUMMARY

The western coast of Hudson Bay in the Kivalliq region of Nunavut is undergoing significant infrastructure development associated with natural resources, shipping and community sustainability. Permafrost and ground ice are important features of this landscape that can significantly affect land-based infrastructure through influence on ground stability and drainage patterns. Knowledge of permafrost conditions is required to characterize climate change impacts. However, there are only limited studies of permafrost and ground temperature data in the Kivalliq region. The proposed activity will provide valuable permafrost information along the western Hudson coast of Nunavut.

Impacts of climate change on permafrost ice, and hydrology in the Canadian High Arctic

License Number: 02 029 22R-M

Principal Investigator: Omelon, Christopher

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Number in Party: 5

Research Locations: Axel Heiberg Island

SUMMARY

The primary purpose of this project is to conduct scientific research on the impact of climate change on polar landscapes with a focus on permafrost, ground ice, glaciers and groundwater. This research is observational in nature and involves topographic DGPS surveys, shallow permafrost GPR surveys, ground and air temperature measurements, as well as assessments of ground ice, vegetation, glacier ice, and groundwater activity. The primary study area is Expedition Fiord on Axel Heiberg Island (79°25'N; 90°43'W), with secondary study sites on Axel Heiberg Island at Strand Fiord and Whitsunday Bay.

Periglacial geomorphology and ground ice investigation in the Houghton Impact Structure Area, Devon Island, Nunavut

License Number: 02 037 22R-M

Principal Investigator: Osinski, Gordon

Affiliation: Department of Earth Sciences
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Number in Party: 18

Research Locations: Devon Island

SUMMARY

The objective of this project is to investigate the periglacial landscapes in and near the Houghton Impact Structure, within a comparative planetary framework. Glacier valleys, ground ice patterned ground, polygons and gullies will be studied using airborne and satellite images, sampled in the field and analyzed in a laboratory. Water (ice), when buried or underground, is an important paleo-indicator which could help clarify postglacial periglacial dynamics in arid and cold environments, either in the Arctic or on Mars.

Assessing contaminants in migratory bird habitats in Nunavut

License Number: 03 014 22R-M

Principal Investigator: Provencher, Jennifer

Affiliation: Environment and Climate Change Canada
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Number in Party: 4

Research Locations: Arviat, Pond Inlet

SUMMARY

Many contaminants are toxic and can accumulate in food webs, affecting the health of wildlife and humans. They can be carried by wind and water from sources to the Arctic. Birds are also thought to carry some contaminants to the Arctic as well. This project will focus on several contaminants in seabirds and their habitats in relation to another transmission route of contaminants, shipping and vessel traffic. We will focus on two groups of contaminants known to be associated with vessels – oil-related contaminants (polycyclic aromatic hydrocarbons (PAHs) and metals) and plastic pollution. We propose to install passive air samplers (PAS) for organic contaminants in the Pond Inlet area. Passive sampling refers to collecting contaminants from air on a trap that sits out in the open without any pumps pulling in the air. Passive samplers are a low-cost, low-maintenance way to monitor contaminants because they do not require power for pumps or a shed to house the instruments. They are unobtrusive and they make no noise, do not produce any emissions and they simply sit outside and trap contaminants from the air. This sampling method is ideally suited to the Arctic environment. It is also suitable for involving students or other interested persons in sample collection, enhancing communication with local communities and creating training opportunities.

Arctic Freshwater Biodiversity in Cambridge Bay.

License Number: 04 005 22R-M

Principal Investigator: Rautio, Milla

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Number in Party: 15

Research Locations: Cambridge Bay, Grenier Lake

SUMMARY

In 2021 we plan to sample lakes in Greiner Lake watershed in spring, summer, fall and winter. Some of this work will be carried out by our northern collaborators who are residents of Cambridge Bay. If travel to Nunavut is granted by NRI, Department of Health and approved by the Hamlet, a team of researchers and their students will also go to Cambridge Bay to carry out more demanding sampling and to ensure student training. By more demanding sampling we mean samples that require immediate treatment by procedures that involve training our northern collaborators have not received, e.g., separation of plankton species under microscope for species-specific analyses. Some samples also need to be stored at -80°C and analysed within a short time period after sampling, requiring someone carries them to our southern labs soon after the sampling.

Tree River Geoscience Project

License Number: 04 027 22N-A

Principal Investigator: Reimink, Jesse

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Number in Party: 2

Research Locations: Slave Craton Cover Group, Eokuk Uplift

SUMMARY

The proposed project consists of a collaboration between the University of Alberta and the Pennsylvania State University. This project is focused on sample collection for various graduate student projects. There will be three to five geologists and one float plane pilot staying at the Plummer's Lodge on the Tree River and Kugluktuk, Nunavut. We will take day trips with a Bush Hawk float plane to nearby lakes where the geologists will use small rock hammers to take ~1kg rock samples for scientific research. We will conduct field sampling of ancient basement rocks exposed on the surface. We will be residing at the Plummer's Tree River Lodge and Kugluktuk for the duration of our project and will be flying a Bush Hawk float plane up to 100 km from this location during the day. We will land the Bush Hawk on small lakes, and hike to outcrops near the lakes. Once at outcrops of scientific interest, we will use small hand hammers to take geological samples for research (~1 kg samples) of the rocks of scientific interest. We will be sampling for 12-15 days and expect to collect ~100 samples of rocks in this time period. The sampling will be spread out and will largely be focused on going back to sample locations that have been described by previous Geological Survey of Canada bedrock mappers, projects that took place in the 1980s. Our crew will consist of three to five geologists and a float plane pilot.

Barrow Strait Ocean Observation Program

License Number: 02 039 22R-M

Principal Investigator: Richards, Clark

Affiliation: Department of Fisheries & Oceans
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Number in Party: 3

Research Locations: Barrow Strait

SUMMARY

The goal of this project is to provide a real time ice and ocean data delivery system that includes an ice onset and break-up prediction capability in Barrow Strait at the eastern end of the Northwest Passage. It will provide an ability to monitor and predict the evolution of the ice cover for the improved safety and efficiency of Arctic marine operations, make ice cover data and ocean measurements available to hunters and other interested parties, provide data for ice/ocean forecast models, and provide a technology that is applicable to other strategic Arctic locations.

Partnership for understanding environmental change impacts on water security and water quality in Iqaluit, NU

License Number: 01 013 22R-M

Principal Investigator: Richardson, Murray

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Number in Party: 8

Research Locations: Iqaluit and surrounding area

SUMMARY

This Polar Knowledge Canada funded research aims to provide the City of Iqaluit with the understanding of how water quantity and quality are responding to changing climate and permafrost dynamics in current or future source water regions, including the Niaqungut (Apex) and Lake Geraldine watersheds. The knowledge gained through this research will support water resource management and planning in anticipation of continued population growth and rapid climate change in this region. There is a critical absence of baseline information on major hydrologic pathways, water quality dynamics, and permafrost conditions and dynamics (degradation) affecting freshwater resources in Iqaluit. Such information is essential for effective medium to long-term water supply forecasting and management for Nunavut's capital city.

Shift-eDNA

License Number: 02 026 22N-A

Principal Investigator: Sanchez, Loic

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Number in Party: 2

Research Locations: Baffin Bay, Davis Strait (Coast of Baffin Island)

SUMMARY

Our goal is to sample environmental DNA (eDNA) in the Arctic regions of Canada, with a protocol completely carried out offshore on 2 different boats. One boat will host 3 persons, the other one will host 4 persons. No facilities will be constructed. The analysis of eDNA will be carried out in France, and results will be shared with local communities and published in an open access journal. Sampling eDNA only requires one to filter surface seawater: indeed, it has no impact on wildlife, it doesn't affect the species behavior and provides better results than most conventional survey methods. Why? We hope to survey marine fish communities in coastal waters, in order to detect early species arrival due to climate change.

Environment & Climate Change Canada Eureka Snow on Ice Sea Ice Campaign 2022

License Number: 01 001 22N-A

Principal Investigator: Toose, Peter

Affiliation: Environment & Climate Change Canada
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Number in Party: 6

Research Locations: Eureka

SUMMARY

The Canadian Arctic Archipelago (CAA) is a unique sea ice region located in northern Canada, adjacent to the Arctic Ocean. The northern CAA represents a region of the Last Ice Area, which will become the only refuge for sea ice-dependent species when the majority of the Arctic Ocean becomes sea ice-free during the summer. As the CAA warms, it will also become a source of freshwater via increased inflow of Multi-Year Ice (MYI), potentially impacting freshwater concentrations and large-scale ocean circulation patterns. Moreover, the increased inflow of thick MYI is a serious maritime safety concern for shipping. Traditional monitoring of sea ice within the CAA has lacked volumetric / ice thickness information. The recently launched (2018) NASA ICESat-2 satellite holds potential to provide high-spatial resolution estimates of sea ice thickness, which should be able to more accurately estimate volumetric freshwater MYI in-flows, and identify thick MYI shipping hazards.

Microbial investigations of perennial springs, permafrost and ground ice in the High Arctic

License Number: 01 032 22R-M

Principal Investigator: Whyte, Lyle

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Number in Party: 4

Research Locations: Axel Heiberg

SUMMARY

The microbial biodiversity in unique habitats including cold perennial salt springs and permafrost environments have not been fully explored, and molecular traits that enable microorganisms to survive and thrive in the Canadian High Arctic are unknown. My research program examines microbial biodiversity and ecology in unique polar habitats and aims to expand our knowledge of polar microbial communities.

Evaluation of natural bioremediation potential of Arctic beaches

License Number: 02 033 22R-M

Principal Investigator: Whyte, Lyle

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Number in Party: 4

Research Locations: Cornwallis Island

SUMMARY

The warming Arctic climate results in annual reductions of sea-ice. With decreases in Northwest Passage ice cover, the amount of shipping traffic is increasing. Unfortunately, a consequence of more shipping is an increased risk that shipping fuel will be accidentally released into the vulnerable Arctic environment. In southern latitudes, naturally occurring bacteria in the environment can consume shipping fuels as food sources. However, it is unknown if naturally occurring bacteria living in Arctic beaches can do this in the colder Arctic conditions. The objective of this research is to determine if naturally occurring Arctic bacteria have the ability to degrade shipping fuels under Arctic conditions. It is important to know this so that in the event of a future accidental shipping fuel spill in the Arctic, we will know exactly how to respond to minimize negative environmental impacts.

Developing new technologies to access and investigate the hypersaline, subzero Devon Island Subglacial Lake System, a unique Mars and icy moon analogue

License Number: 02 053 22N-M

Principal Investigator: Whyte, Lyle

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Number in Party: 6

Research Locations: Devon Ice Cap, Devon Island

SUMMARY

Recent evidence obtained through orbital radar sounding indicates the presence of subglacial lakes ~800 meters below Mars' southern ice cap. Such subsurface saline water bodies may support active microbial ecosystems. Considerable evidence has also been found in the last decade to support the existence of large cold, salty oceans under the ice covers of the icy moons, Europa, and Enceladus. The main goal of this project is to characterize a unique terrestrial analogue environment of these icy worlds: the recently discovered hypersaline lake complex under the Devon Ice Cap of Nunavut, Canada. The Devon Island subglacial lakes consist of 3 lakes lying beneath 560-740m of ice; modelling indicates temperatures of -12°C and high salinities of ~15% salt. Due to their hypersaline nature, the Devon subglacial lake complex is a particularly tantalizing analogue for brine bodies inferred to exist on Europa, Enceladus, and Mars, and make it a compelling site to address fundamental questions about how life persists at terrestrial extremes of darkness, temperature, salinity, and pressure. Our 3-year CSA FAST application is the first step to access the Devon Island lakes directly by testing and optimizing an ice drilling system, collecting ice samples overlying the lakes for microbiological analyses and optimizing 2 biosignature detection prototypes, and to further constrain geomorphological parameters of the system.

Chidliak Project Environmental Baseline Program

License Number: 01 015 22R-M

Principal Investigator: Willis, David

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Number in Party: 6

Research Locations: Hall Peninsula

SUMMARY

The Chidliak Project is located on the Hall Peninsula of Baffin Island in the Qikiqtani Region of Nunavut. The centre of the project is 120 kilometers northeast of Iqaluit and 200 kilometers south of the Hamlet of Pangnirtung. Peregrine Diamonds Ltd. (“Peregrine”) commenced the project in 2008 and in the 10 subsequent years a total of 71 kimberlite volcanos (“kimberlites”) were discovered. Kimberlites are known to contain diamonds. In July of 2018 De Beers Canada Inc. (“De Beers”) made an offer to purchase Peregrine. The offer was accepted by Peregrine shareholders in August of 2018 and the purchase completed in September 2018. De Beers is now the sole owner of Peregrine, however, Peregrine continues as a corporation. Environmental baseline studies are required for the preparation of an environmental impact statement (“EIS”). In 2022 environmental baseline work will continue on the Chidliak Project.