INUVIALUIT
REGIONAL CORPORATION

Inuvialuit Research Newsletter
December 2023

Volume 1 | Issue 5

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The Inuvialuit Regional Corporation

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Acknowledgements

The Inuvialuit Regional Corporation compiled this document with external contributions from the Innovation, Inuvialuit Science and Climate Change Division, Health & Wellness Division, Inuvialuit Lands Administration, IRC's Division of Government Affairs, Paulatuk Hunters and Trappers Committee, the Western Arctic Youth Collective, University of Manitoba, the University of Waterloo, Dalhousie University, Wilfrid Laurier University, University of Saskatchewan, Newcastle University, Alfred Wegener Institute, Live It Earth, NSERC CREATE LEAP, Natural Resources Canada, Fisheries and Oceans Canada, and Environment and Climate Change Canada.

The IRC would like to acknowledge its Innovation, Inuvialuit Science and Climate Change (ISCC) Division for its hard work and dedication to the fifth edition of the Inuvialuit Research Newsletter. We extend our sincere thanks to our editorial team, who worked tirelessly to review, edit, and format the articles and photographs for this edition. The IRC is especially grateful to the Inuvialuit Communications Division for providing editorial support.

We would like to thank our funding partners and all contributors for investing their time and knowledge in creating the Inuvialuit Research Newsletter. The IRC apologizes in advance for any misspellings of names of people and/or organizations featured in this edition. If any discrepancies are found, please contact the IRC's ISCC Division with your concerns. The IRC's ISCC Division's contact information is on page 96.

Una qulianga Ningaqsiq Dwane Smith gum

Quyarunga uuminga quliaqama Inuvialuit qimilriurutingannik qulianginniglu maqpiraatitigun.

Una quliaq ilitchurirakrat ataramik ilitchuripkainiaruurugut tuhaaraptingnik ilitchuriraptingniglu, iluamik ,ataulugi ilitchuriakrat , qimilriulautaqtuat ukuat havautarrilgitkaat Inuvialuit Inaannin {ISR}.Una qimilriuqtaq hunaliqaa ilitchuriakrat, matkualu aipaarnihat qimilriqtat hurarautimingnik hilakput atlangngirmanpihalattitchirhtta havautarigikput, nunakput qimilriauqhimavlugu, inuulautarniq, inuuniarniqput itinniaqlugu,taigulapayaaqtuanun hiakikiput.

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Aquliqraq una aglaangat ilihimaakrat uniurnaitchuat iliakrapiat tutquhimaniarait inuvialuit paqitangit qimilriuqaming atautchikun , Ukuat ilitchuriprait ISRaat qilriuqtangiha. Inuvialuit-ilingiha pimangat una atautchikun havangniq ilitchuripkairut humik ihumiqaming Inuvialuit hapiqralaitcgut qimilriuqtilautaqqahuting ilihimaruaninik nunamingnik.

Quygigitka quyanaaritka inmingnun qaitchuat ilihimaramingnik aitchuiruat , iluriit, havaktut yaraiqhuting havaktuat una pilahipkaqlugu ilitchuripkainiq, Una aglaktani tautuktuani ilitchurirakrat iluqating ittut qimilriuqtani inillaani qimilriuqtat inuvialuit ilihimrangit ittut innilaani.

Katimafaaruptalu quyahuniaqtunga tautufaaru_ ikayuutilutalu utimun uqaqatigiiqupta iluitchuat iluaqtuat uqarilugi hiivuniptingni atuakrafaavut,Ilitchuripkarutigut iluigikaarnik ikayuutauhiruq qimiliuqtannun. Ikayuurniariptigut uqautigigupki iluigikatin, tuhaahuktugut qanuq ihumagirarnik qinilriuqtatigun ilitchuripkaluta iluigirarnik.

Quyaqpak quyanainni quana

Duane Ningaqsiq Smith
Hiviutaat CEO, Inuvialuit Aqapiringiha

Message from the Chair and CEO

I am blessed to present the fifth edition of the Inuvialuit Research Newsletter. This publication reflects our ongoing dedication to highlighting the diverse, innovative, and remarkable research carried out in the Inuvialuit Settlement Region (ISR). This edition covers a wide range of topics, including the latest studies and developments in climate change, renewable energy, environmental monitoring, health, and cultural preservation, offering valuable insights for all readers.

The research featured in this newsletter is a testament to the expertise and dedication of the beneficiary researchers and partners who have contributed to the wide range of studies conducted in the ISR. The ISR continues to be a vital hub for research in Canada, with a growing number of requests from partners and researchers to conduct studies in the region. We are dedicated to advancing research in the region to support our beneficiaries, community organizations, and governments. We remain committed to accurately documenting, recognizing, and celebrating these important research projects, and we deeply appreciate your contribution to this process!

The latest edition of this newsletter highlights the valuable and innovative research projects carried out by Inuvialuit organizations and their partners. These projects are leading the way in JSR research. Inuvialuit-owned and partnered initiatives demonstrate significant progress towards greater Inuvialuit self-determination in research and the proper recognition of Inuvialuit Knowledge.

I am grateful to our contributors, partners, and staff for their tireless efforts in making this edition possible. The articles will provide you with insight into the latest research taking place in the region.

We look forward to your continued support and feedback as we strive to provide you with informative and engaging content in future editions. Your feedback is invaluable to us, and we look forward to your thoughts on the latest research and how we can improve our future editions to better serve your needs.

Quyanainni! Koana! Quyanaqpak!

Duane Ningaqsiq Smith
Chair and CEO, Inuvialuit Regional Corporation

Inuvialuit Regional Corporation Board of Directors

Inuvialuit Regional Corporation's Board of Directors, back row, from left to right: Rory Voudrach – Director, John Lucas Jr. – Director, Ryan Yakeleya – Director, Lawrence Ruben – Director, Jordan McLeod – Director; front row (seated) from left to right: Duane Smith – Chair and CEO, and Pat Klengenberg – Director. Photo courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division.

↑ Photo courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division

2023 Research Priorities

2023-2024 ISCC Divisional Research Priorities

2023 Strategic Research Priorities

Determined through information gathered from the IRC 42 directors meeting (October 2022)

Environmental Change

- Water Quality (Temperature, Contaminants & Microplastics)
- Climate Change Impacts on Travel
- Shoreline Erosion & Flooding
- Harvest Study

Health & Wellbeing

- Climate Change Impacts on Human Health & Food Security
- Wellness (Addictions, Mental Health and Youth)
- Energy
- On The Land/Marine Safety
- Vessel Traffic and Cumulative Impacts
- Language and Culture

2023 Community Identified Research Priorities

Determined through information gathered from the ISR Community Tour (Nov & Dec 2022)

Environmental Change

- Water Quality
- Erosion
- Climate Change
- Invasive Species and Fish Health

Health & Well-being

- Community Wellness
- Safety (On-the Land safety, Boating safety/Water safety)
- Energy
- Youth Opportunities
- Innovative Ideas for Small Business (tourism)
- Language and Culture
- Research Ethics

About IRC's Innovation, Science and Climate Change Division

The Innovation, Inuvialuit Science and Climate Change (ISCC) Division is a dynamic division established by the Inuvialuit Regional Corporation (IRC) to lead and coordinate research activities and develop policies while promoting innovation, mentorship, training, and engagement in the Inuvialuit Settlement Region. With a focus on Inuvialuit science, our divisional goals are to (1) communicate research initiatives more effectively, (2) ensure Inuvialuit are meaningfully included in all research policies and processes, (3) strengthen capacity to lead research activities, (4) ensure Inuvialuit Knowledge and Western science are equally respected, and (5) mentor the next generation of Inuvialuit researchers.

The ISCC division was created in 2019 and has grown in staff and size each year since its inception. This unit began with eight employees and twelve projects. Since then, the division has been expanded to fourteen staff, twenty-seven projects, four policies, a K-12 educational program, a mentorship program, and mobile laboratory infrastructure. The division is organized into three main areas: Data Science & Methodology; Research Programs, Policy & Administration; and Health & Engagement.

Inuvialuit Regional Corporation

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Roxanne Springer, Climate Change Program Coordinator
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Lesli Kisoun, Research Administrative Assistant
Nya Maring, Research Laboratory Assistant

Health/Engagement
Remi Kusimo, Public Health & Community Research Manager
Pauley Tedoff, Research Health Advisor

2023 Innovation, Inuvialuit Science and Climate Change Division Goals

1 Better Communicate Research

- Better utilize technology when engaging, communicating with or implementing programming in ISR communities to ensure everyone has an opportunity to be aware of and participate in all opportunities.
- Develop a mechanism to ensure internal research results/data are organized, discoverable and accessible by a local audience.
- Expand the ISR Research Newsletter, and develop IRC Research Briefs/Summaries.
- Publish Annual Inuvialuit Research Priorities.

2 Ensure Inuvialuit are meaningfully Involved in all Research Policy and Processes in the ISR

- Create formal mechanisms for Inuvialuit to have a say in research involving Inuvialuit.
- Develop Inuvialuit-focused research policies related to:
  - Engagement
  - Local Employment
  - Ethics

3 Strengthen Inuvialuit Capacity to Lead ISR Research Activities

- Operate and maintain an accredited mobile research lab.
- Develop and sustain research capacity in all ISR communities.
- Organize free Inuvialuit training opportunities, and create a research skills database.

4 Ensure that both Inuvialuit Knowledge and Western science are equally respected in policy/decisions related to the ISR

- Foster a culture of innovation and self-determination.
- Lead a robust internal research program that addresses local priorities.

5 Mentor the next generation of Inuvialuit Researchers

- Provide youth with employment and opportunities to be directly involved in research.
- Provide youth with training and mentorship activities to build skills while transferring knowledge.
- Develop and administer a JK-12 Inuvialuit STEM Program in all ISR communities.

Inuvialuit Settlement Region Research Projects

Inuvialuit Regional Corporation's Internal Research Projects

Powered By Youth - Cleaner Energy Virtual Discussion Group

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Nipa Dutta, IRC's Clean Energy Program Coordinator

Kyla Hvatum, IRC's Environment and Climate Change Policy Assistant

Shanay Williams, IRC's Research Administration Programs Manager

Communities Involved
Inuvialuit Settlement Region (Inuvik, Tuktoyaktuk, Aklavik, Paulatuk, Ulukhaktok, Sachs Harbour)

Completion Status
Ongoing

Project Objective/Purpose
The Powered by Youth (PbY) program, initiated by the Inuvialuit Regional Corporation (IRC), aims to enhance youth involvement in driving sustainable energy development in the Inuvialuit Settlement Region (ISR). By emphasizing STEM (Science, Technology, Engineering, and Mathematics) opportunities, PbY encourages Inuvialuit Youth to explore career pathways in energy and climate change, acquiring in-demand skills. This outreach program provides a platform for information sharing and discussions on clean energy, climate change, and career opportunities, promoting energy literacy. The goal of this ongoing program is to ensure that the Youth are included in IRC's ongoing and future cleaner energy related planning and programming within the ISR.

Project Description

The Inuvialuit Regional Corporation (IRC) is actively engaging with Inuvialuit youth across the Inuvialuit Settlement Region (ISR) to incorporate their perspectives into research and policy. In 2020, the IRC established the Powered by Youth (PbY) group in response to community interest within the ISR for increased youth involvement in leading the clean energy transition. This engagement forum aims to promote energy literacy, enhance communication, and boost youth participation in regional energy initiatives. Currently, the Powered by Youth group comprises approximately 100 members and convenes virtually on the Facebook platform.

In its first year, PbY focused on virtual discussions and online surveys related to clean energy projects, climate change scenarios, and community energy planning. In year two, the IRC collaborated with the Canadian Centre for Climate Services and the Innovation and Youth Engagement Division to host a virtual session on careers in the climate-related job sector. In year three, the IRC reactivated the group, organizing engaging activities such as contests and surveys for ISR youth within the Powered by Youth Facebook group. As a result, the group has seen a significant increase in membership.

On June 19, 2023, the IRC successfully hosted the third discussion session of the Powered by Youth group, which included representatives from the Inuvialuit Youth Advisory Group (RYAG), the Paulatuk Energy Working Group, the Western Arctic Youth Collective, and Indigenous Clean Energy. The recorded videos of the second and third virtual discussion sessions have also been shared on the PbY's Facebook group to reach a wider audience. Moving forward, the IRC will continue to deliver Powered by Youth programming, including multiple virtual sessions, in-person meetings, surveys to gather youth ideas and insights on energy planning, and educational initiatives to enhance youth participation in the cleaner energy transition within the ISR.

↑ Photos courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division

ISR Climate Watch

↑ Photo courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Roxanne Springer, IRC's Climate Change Program Coordinator

Jenn Parrott, IRC's Director of Innovation, Inuvialuit Science and Climate Change Division

Communities Involved
All Inuvialuit Settlement Region Communities (Inuvik, Aklavik, Tuktoyaktuk, Paulatuk, Ulukhaktok, Sachs Harbour)

Completion Status
Ongoing

Project Objective/Purpose
The Climate Watch project aims to foster knowledge exchange between Inuvialuit beneficiaries and Climate Change experts. This will be achieved by conducting surveys and discussions to explore the climate changes, weather, and environmental observations that Inuvialuit have made throughout their lifetime in the ISR, which will be consolidated into a final product for community members and researchers to access.

Project Description

The Climate Watch initiative was established to address the concerns of Inuvialuit community members across the ISR. Inuvialuit have observed a disconnect between recent climate change monitoring programs and their own historical knowledge and observations. The Inuvialuit in the ISR possess a rich history that has been passed down orally. The climate watch project aims to record and document Inuvialuit knowledge on climate, weather and environmental observations for public access and future reference.

The Climate Watch Project derives its information from community engagements. Beginning in 2022, the Climate Change Coordinator facilitated several surveys and discussion forums to allow community members to share their observations on climate change. Climate Watch surveys and discussions were completed in February 2024, and the observations were validated by community members in March 2024. These community engagement opportunities served as a valuable source of information for the project.

The successful completion of this project will better inform community monitoring programs and advance Inuvialuit self-determination in climate change research and actions. Furthermore, this initiative will provide the general public with access to crucial data on climate changes and observations, empowering them to monitor any changes and remain up-to-date on weather events impacting our environment. The observations and Inuvialuit knowledge recorded during this project will be available in September 2024.

We want to express our immense gratitude and give special acknowledgement to the many individuals and groups who have played a crucial role in the success of this project. Community members, knowledge experts, community monitoring programs, Elders committees, youth assistants, and community corporations have all contributed significantly and we are deeply thankful for their support.

Improving Communication on Climate Change & Cleaner Energy Terminology for Inuvialuit and Researchers in the Inuvialuit Settlement Region (ISR)

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Roxanne Springer, IRC's Climate Change Program Coordinator

Nipa Dutta, IRC's Clean Energy Program Coordinator

Shanay Williams, IRC's Research Administration Programs Manager

Jenn Parrott, IRC's Director of Innovation, Inuvialuit Science and Climate Change

Communities Involved
Inuvialuit Settlement Region (Inuvik, Tuktoyaktuk, Aklavik, Paulatuk, Ulukhaktok, Sachs Harbour)

Completion Status
Ongoing

Project Objective/Purpose
Our goal is to enhance communication and comprehension of scientific terminology related to climate change, energy, and environmental research and initiatives. To achieve this, we are creating and promoting a glossary that provides precise and consistent translations for related terms across all three Inuvialuktun dialects spoken in the ISR: Kangiryuarmiutun/Inuinnaqtun, Sallirmiutun, and Uummarmiutun.

To accomplish our objective, the Inuvialuit Regional Corporation (IRC) hosts annual translation workshops. These workshops bring together representatives from each ISR community, including Elders and Youth. The IRC plans to develop a comprehensive Terminology Glossary that will be accessible to both community members and researchers.

Project Description

The impact of climate change on the Arctic environment has intensified research efforts in Arctic communities. Moreover, continued advancements made in climate change, energy, and environmental related research have resulted in an increase in the use of more sophisticated and specialized terminology. However, the scientific jargon in these studies can pose a communication barrier for Inuvialuit language speakers in the ISR, resulting in a disconnect between researchers and community members.

Our project aims to address this challenge by creating a comprehensive Terminology Glossary that standardizes terminology across all three Inuvialuit dialects: Kangiryuarmiutun/Inuinnaqtun, Sallirmiutun, and Uummarmiutun. The glossary will facilitate communication and enhance understanding between researchers and the Inuvialuit community, ultimately fostering a more collaborative approach to addressing climate change effects in the ISR.

In a significant achievement, Inuvialuit language experts in the ISR have meticulously translated eighty-one terms related to climate change, energy, environmental science, and long-range contaminants into each Inuvialuktun dialect. These translations are accessible on the IRC Research website and will be included in an updated glossary booklet. Additionally, we plan to translate twenty more terms in the coming year.

To ensure accurate translations, IRC organized a series of three-day terminology workshops in September 2019, March 2022, and November 2022 with Inuvialuit language holders from each ISR community. The most recent terminology workshop was held on October 24 – 26, 2023 at Ingamo Hall, with 13 Elders and 6 Youth representatives from all six communities. IRC has expanded the scope of this ongoing effort and successfully included both Inuvialuit Elders and Youth for IRC's third and fourth terminology workshops in November 2022 and October 2023. Youth representatives will continue to be involved in subsequent workshops to allow for a transfer of knowledge and increase exposure to these translated terms.

To raise awareness among the younger generation about climate change, we have created two children's books and multiple Inuvialuktun word searches that incorporate the translated terminology from our workshops. These resources are promoted at community events, engaging children and youth in understanding the critical issue of climate change.

We extend our heartfelt gratitude to the Inuvialuit knowledge experts and beneficiaries for their invaluable contributions in translating terminology. Special thanks also go to the authors of the children's books, as well as the Community Corporations, Inuvialuit Cultural Resource Center, Elders Committee, IRC Communication Division, and youth representatives, whose collective efforts have been instrumental in developing these essential resources.

← The first climate change and cleaner energy terminology glossary booklet is available for download on the IRC website: *Improving-Communication- on-Climate-Change-and-Long-Range-Contaminants-for-Communities-and-Researchers-in-the-ISR_0.pdf (inuvialuit.com)*

← The first children's book, Energy from our Environment, is also available for download on the IRC website: *https://irc.inuvialuit.com/research/energy-from-our-environment-a-childrens-book/*

↑ Photos courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division

Evaluating Microplastic and Additive Concentrations in the ISR Waterways

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Shanay Williams, IRC's Research Administration and Programs Manager

Kyla Hvatum, Environmental Policy and Climate Change Assistant

Communities Involved
Inuvialuit Settlement Region (Inuvik, Aklavik, Tuktoyaktuk, Paulatuk, Ulukhaktok, Sachs Harbour)

Completion Status
Ongoing

Project Objective/Purpose
The overarching objectives for the Evaluating Microplastic and Additive Concentrations in the ISR Waterways are to evaluate the distribution and abundance of primary and secondary microplastics in drinking water across the six communities in the ISR and to foster engagement and inclusivity through sessions focused on Inuvialuit Knowledge exchange on water security and sovereignty.

➔ **Project description on page 20**

Project Description

Reliable access to clean drinking water is a focus in many Inuit communities, because the impacts of water contaminants go beyond an inconvenience due to limited access to healthcare and education. Although access to clean drinking water is a human right, the ISR tends to be politically and economically marginalized. Therefore, effective water quality monitoring and water quality database development are critical to identifying and conveying the need for activities/regulations to better protect water resources.

The distribution and abundance of microplastics (synthetic solid particles less than 5 mm in size) have become a global concern. However, the implications of microplastics on human health are not thoroughly understood, especially in the North, where their impacts can have confounding effects on already marginalized groups. These plastics are a key concern to the ecosystem and human health as they accumulate in water, soil, and the food chain, and more data is needed to evaluate risks.

This project evaluates the distribution and abundance of microplastics in drinking water by testing water on the land (lakes and rivers) and at the local water treatment plants. We also interviewed community members and Elders who are knowledge experts on water in the communities and on the land. These interviews and water sample testing will serve as a baseline for water quality and a foundation for Youth to continue maintaining the waterways. Ultimately, this project will allow Inuvialuit to document water conditions, mitigate accumulation, and create effective policies as needed.

↑ Photos courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division

Investigating Water Quality in Fish-Bearing Lakes Between Inuvik and Tuktoyaktuk

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Shanay Williams, IRC's Research Administration and Programs Manager

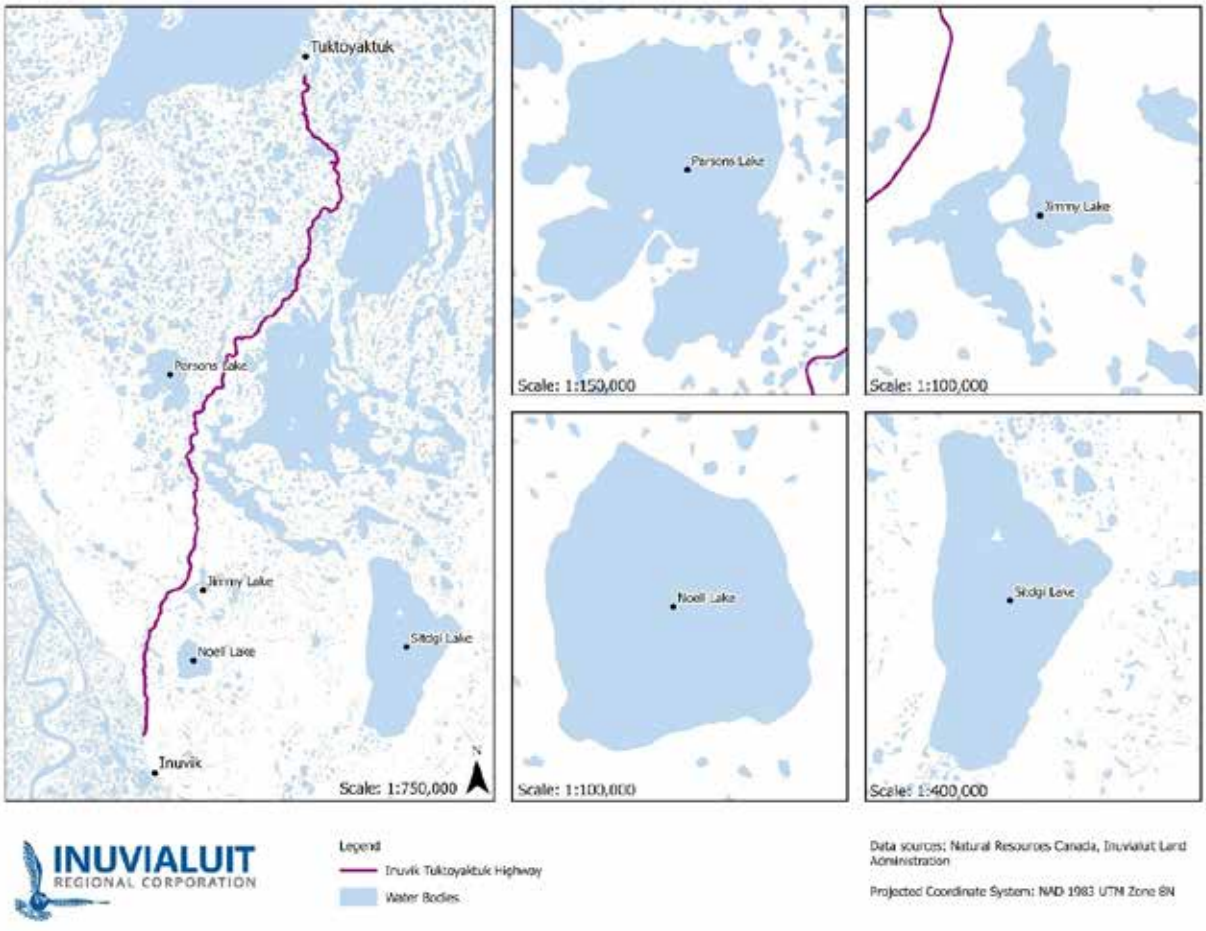
Communities Involved
Inuvik and Tuktoyaktuk

Completion Status
Ongoing

Project Objective/Purpose
The lakes between Inuvik and Tuktoyaktuk hold cultural and spiritual importance to Inuvialuit and economic value through harvesting, fishing, and trapping. With the new all-season Inuvik-Tuktoyaktuk Highway built in 2017 and increased tourism, there is a potential for contaminants from vehicles and human debris. Our research project sought to develop a long-term water quality database for Inuvialuit to document and monitor water conditions. We sought to evaluate metal, nutrient, and hydrocarbon concentrations in Jimmy, Parsons, Noell, and Sitidgi Lakes while investigating how perceptions of lake water quality aligned with Inuvialuit Knowledge and use of these lakes.

Project Description
The first of its kind, IRC designed this project to generate a water quality database for long-term water health monitoring on lakes between Inuvik and Tuktoyaktuk, working closely with the Inuvialuit community members living in the area. Jimmy, Parsons, Noell, and Sitidgi Lakes are important to Inuvialuit because of traditional activities like fishing, harvesting, travelling, and recreation. This project will have three components that integrate traditional and academic knowledge to drive environmental and sustainability action plans. Firstly, IRC researchers and local Inuvialuit will conduct structured surveys of community members living in or between Inuvik and Tuktoyaktuk to gather first-hand knowledge detailing the cultural value and potential concerns around water quality in the lakes. Secondly, IRC researchers and local Youth will collect and analyze lake water to determine water quality, building on previous research from the Tuktoyaktuk Community Committee, Aurora College, and the Department of Fisheries and Oceans to include a wider suite of organic and inorganic parameters. Lastly, this research will incorporate an educational component that features on-the-job training for high school students and young adults.

↑ Photos courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division



↑ Map showing the four study sites for the Water Quality in Fish-bearing Lakes between Inuvik and Tuktoyaktuk project: Parsons Lake (top left), Jimmy Lake (top right), Noell Lake (bottom left), and Sitidgi Lake (bottom right) between Inuvik and Tuktoyaktuk, NT.

ISR Climate Change Action Map

↑ Photo courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Roxanne Springer, IRC's Climate Change Program Coordinator

Communities Involved
All Inuvialuit Settlement Region Communities (Inuvik, Aklavik, Tuktoyaktuk, Paulatuk, Ulukhaktok, Sachs Harbour)

Completion Status
Completed with ongoing status

Project Objective/Purpose
The Climate Action Map aims to inform and engage Inuvialuit community members and research partners by showcasing climate change, energy, and environmental research activities in the ISR in a user-friendly and accessible format.

Project Description
Although the Inuvialuit Settlement Region (ISR) is a center for climate change, energy, and environmental research and action, there is still a notable information-sharing gap between project leaders and Inuvialuit beneficiaries. This gap poses a significant barrier to distributing information about the many initiatives undertaken in the region in recent years.

To address this issue, the ISR Climate Action Map has been created to increase community awareness of ongoing research projects, encourage discussions on initiatives in the region, and promote the 2022 ISR Climate Change Strategy. With the help of the Climate Action Map, IRC can inform the public about climate change research, including Inuvialuit and researchers, by highlighting both new and ongoing projects and opportunities for involvement in the area.

The ISR Climate Change Story Map on the ISR Climate Change Website, updated annually, briefly summarizes the climate change action map. This story map contains correlating slides that describe ongoing research and provide context for these activities being done in the ISR. The Climate Change Action Map and the Climate Change Story Map work together to provide information on the research being conducted in the ISR and promote research opportunities to community members.

The map and its supporting assets can be accessed online at the following link: *https://climateactionmap.inuvialuit.com/*

Special Day with My Anaanak – A Children's Book on Knowledge Transfer Between Elders and Youth

↑ Image courtesy of Tyra Cockney-Goose, IRC.

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Jenn Parrott, IRC's Director of Innovation, Inuvialuit Science, and Climate Change
Meghan Etter, IRC's Director of Health and Wellness
Tyra Cockney-Goose, Former IRC Environmental Policy and Climate Change Program Assistant
Shanay Williams, IRC's Research Administration and Programs Manager

Communities Involved
Aklavik, Inuvik, Paulatuk, Sachs Harbour, Tuktoyaktuk, and Ulukhaktok

Completion Status
Ongoing

Project Objective/Purpose
The goal of this project is to create a knowledge transfer-themed Inuvialuit children's book and accompanying audiobook in English and the three Inuvialuktun dialects and, in turn, promote Inuvialuit language and environmental literacy in the ISR.

Project Description
The book *Special Day with My Anaanak* is developed in partnership with the IRC's Health and Wellness Division and will highlight themes of knowledge transfer between Elders and Youth using climate and environment terminology translated from the "Improving Communication on Climate Change & Cleaner Energy Terminology for Inuvialuit and Researchers in the Inuvialuit Settlement Region (ISR)" workshops. The storybook will be available in English and all three Inuvialuktun dialects and will discuss Inuvialuit Knowledge and the importance of Elder-Youth relationships. This project has already achieved several milestones, including a storybook writing contest, the selection of an Inuvialuk contest winner, the selection of an Inuvialuk illustrator, the translation of the English version into the three Inuvialuktun dialects, and the March 2022 Translation Workshop for the climate and environmental terms.

This project will result in several deliverables: the one story will be developed into four books (English, Uummarmiutun, Kangiryuarmiutun, and Sallirmiutun) with accompanying audiobooks to promote science literacy in the ISR schools, renew Inuvialuit dialect and culture, and promote cross-generational learning between Elders and Youth on Inuvialuit traditional practices, language, and sustainability. The final product will be publicly available in digital, printed, and audiobook formats.

Inuvialuit Stewardship on the Land Program

↑ Map showing study sites for the Inuvialuit Stewardship on the Land Program conducted by the Inuvialuit Lands Administration.

Organization Name
Inuvialuit Lands Administrationt

Project Lead(s)
Charles Klengenberg, IRC's Director of Lands
Chris Gruben, IRC's Manager of Inuvialuit Lands

Communities Involved
Aklavik, Inuvik, Paulatuk, Sachs Harbour, Tuktoyaktuk, and Ulukhaktok

Completion Status
Ongoing

Project Objective/Purpose
The purpose of the program is to (a) establish a regular long-term monitoring and testing regime; (b) assist in developing adaptive solutions, ensuring the sustainability of Inuvialuit lands for future generations; (c) increase community capacity and self-determination in research on soil and water conditions; (d) develop a science data portal; and (e) develop a science monitoring framework that supports evidence-based decision making for effectively managing, monitoring, and protecting Inuvialuit lands.

Project Description
This 2-phase program is designed to identify areas with environmental or human-made disturbance sites in the ISR. The first phase included an iPad survey of Inuvialuit adults in the six ISR communities and was led by a Community Stewardship Monitor who facilitated the survey. The survey focused on collecting data regarding human-made and environmental disturbances in each community through Inuvialuit Knowledge. The data from the survey was then used to confirm the locations of identified disturbances as well as flag areas requiring further investigation for remediation services. The second phase of the program expanded on Phase 1 to include the physical testing of soil and water in areas identified as environmental and human-made disturbances. In this phase, IRC also disseminated the survey data from Phase 1 throughout the ISR and facilitated knowledge sharing between Youth, Inuvialuit Traditional Knowledge Holders, and researchers. IRC utilized and built on community capacity to work towards long-term testing, monitoring, and remediation plans and implemented the use of current data-gathering devices, such as drones, to further support the program.

Qanuippitaa? National Inuit Health Survey (QNIHS)

↑ Photos courtesy of the Inuvialuit Regional Corporation's Health and Wellness Division.

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Meghan Etter, Director, Health and Wellness
Pauley Tedoff, Health Research Advisor
Remi Kusimo, Public Health & Community Research Manager

Communities Involved
All six ISR communities: Aklavik, Inuvik, Paulatuk, Sachs Harbour, Tuktoyaktuk & Ulukhaktok

Completion Status
Ongoing

Project Objective/Purpose
QNIHS aims to address the current lack of Inuit-determined, quality data on the health of Inuit in Canada by providing data that are a) relevant and culturally safe; b) up-to-date; c) comparable across populations and time; d) comprehensive; e) Inuit- determined and owned; and f) easily accessible by Inuit. The survey results will provide the evidence needed to plan, implement, and improve on the design and execution of health policies, programs, and services towards improving the health outcomes of Inuvialuit.

Project Description

Qanuippitaa? National Inuit Health Survey (QNIHS) is designed to increase access to Inuit-determined and Inuit-owned quality health information that is generated using sound research methodology and a decolonized theoretical approach. QNHIS was co-designed by the four Inuit Land Claims Organizations in collaboration with Inuit Tapiriit Kanatami. It is currently implemented as a permanent survey on Inuit health and wellbeing in Canada. The survey is informed by Inuit knowledge, values, and worldviews and is characterized by a high level of Inuit stakeholder engagement, as well as the latest health sciences research. The survey information will assist in the identification of a) the health needs of communities; b) gaps in service and programs delivery; and c) other aspects of the health system that are suboptimal. It will also highlight the strengths of Inuit culture, traditions, and people. The ultimate purpose of the survey is to improve health and well-being of Inuit in Canada through increased access to Inuit-determined quality health information that captures the ***real*** needs of the Inuit communities with respect to health and well-being.

The implementation of the QNIHS has both immediate and long- term benefits to the Inuit Nunangat. Capacities to implement a permanent survey and to own and manage health information will be built in the regions as an immediate outcome. Knowledge management, collaboration and partner engagement skills will also be improved and sustained for future surveys. Ultimately, the results of the survey will be harnessed to improve health policy dialogues, processes, and implementation; facilitate stronger Inuit control of health research; and empower Inuit to take control of their spiritual, mental, physical, and social well-being. The evidence generated from the survey will form the foundation for stronger health policies and programs that are tailored to the needs of the regions and delivered within a culturally safe framework.

In the Inuvialuit Settlement Region, the survey is being administered by the Inuvialuit Regional Corporation (IRC). The Health & Wellness Division in collaboration with ISCC, will govern and facilitate access to the survey data, including publishing results that are engaging and accessible to Inuit and organizations that serve Inuit populations. QNIHS data collection was successfully completed in May 2022, and data analysis is currently underway. Results of the survey will inform health decision-making and improvement in health services in the Inuvialuit Settlement Region. The design and implementation of the survey was community-led using a participatory action research framework that allowed for equal and meaningful contributions of elders, community leaders and other member stakeholders. The data will be analyzed to meet the specific 'information' needs of the communities based on several dialogues that were held to determine what will offer the most benefit to Inuvialuit. Information on mental health, adequate and affordable housing, food security, reproductive and sexual health, oral health, social and systemic discrimination, education, social capital, culture, language, and substance abuse are among the key constructs of the survey. Dissemination of the findings will be community-led using culturally appropriate and effective approaches. Communication of the survey findings will prioritize knowledge dissemination in ways that can empower Inuvialuit to take action towards improving their health and well-being.

Qanuippitaa? National Inuit Health Survey
GUIDING PRINCIPLES

Understanding Patterns of Social Interaction in the Inuvialuit Settlement Region (or Community Connections Survey)

↑ Photo courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Ryan Mazan, Applied Research Manager

Jenn Parrott, Director, Innovation, Inuvialuit Science and Climate Change Division

Communities Involved
Inuvik, Aklavik, Tuktoyaktuk, Paulatuk, Ulukhaktok, Sachs Harbour

Completion Status
In progress

Project Objective/Purpose
The purpose of the study is to collect information about daily contacts between Inuvialuit to better understand how infectious diseases (such as COVID-19) spread through communities in the Inuvialuit Settlement Region. This is the first time that data of this nature will be collected in the Arctic. Results can support the development of public health guidelines and other preventative measures for virus transmission.

Project Description
The Inuit Qaujisarnirmut Pilirijjutit (IQP) program funded the IRC- led project to help us better understand virus transmission in the Inuvialuit settlement Region. The project design and Community Connections Survey (CCS) were developed and led by the Innovation, Inuvialuit Science and Climate Change (ISCC) division. The CCS is designed to collect information about interpersonal contact patterns of Inuvialuit adults, as well as household and general information. The ISCC administered the paper-based CCS in each of the ISR communities with assistance from Community Representatives. Survey operations were carried out in March 2022. A total of 386 surveys were completed by the end of the collection period, yielding a response rate of about 64%. Data processing and analysis will be completed in the next fiscal year.

Inuvialuit Socio-Cultural Economic Indicators

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Jenn Parrott, IRC's Director of Innovation, Inuvialuit Science, and Climate Change

Bob Simpson, IRC's Director of Intergovernmental Relations

Communities Involved
Aklavik, Inuvik, Paulatuk, Sachs Harbour, Tuktoyaktuk, Ulukhaktok

Completion Status
Ongoing

Project Objective/Purpose
To support evidence-based decision-making in the Inuvialuit Settlement Region by ensuring the best quality social, cultural, and economic data is available to decision-makers.

Project Description

The long-term goals of Inuvialuit self-governance and self-direction require a foundation of good social, cultural, and economic data. It is easier to govern well with access to reliable information about topics such as housing, health, social needs, and economic preferences.

To support these goals, the Inuvialuit Regional Corporation (IRC)'s Innovation, Inuvialuit Science, and Climate Change (ISCC) division is building institutions that will continually acquire, manage, and present regional data on these topics. The work includes forming partnerships with data-holding organizations, developing internal capacity — including policies, systems, and staff training — and cataloguing and making available the data we already have.

Inuvialuit Indicators was launched in 2007 to track the socio-economic well-being of Inuvialuit in the Western Arctic. The timing of its launch coincided with discussions and planning for the proposed Mackenzie Gas Project. IRC determined that this major infrastructure could substantially exacerbate existing social problems in the region. As a result, Inuvialuit Indicators helps monitor the impacts of oil and gas development on the socio-economic conditions in the region and create a database to show historical trends in the years to come. Data has been used from the Northwest Territories Bureau of Statistics; other Government of the Northwest Territories (GNWT) departments, boards, and agencies; Government of Canada; and IRC.

Working with Statistics Canada and the GNWT Statistics Department, we are compiling social, cultural, and economic indicators about life in the ISR.

We are working to ensure these statistics are always available in a consistent format, are available within IRC for staff and directors to use, and published online for ISR residents to reference.

Work is ongoing, but an updated indicator dashboard and factbook is underway and should be available in 2023. The website resides at ***https://research.inuvialuit.com/indicators/.***

↑ Photos courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division

Inuvialuit Settlement Region Platform

↑ Photo courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Jenn Parrott, IRC's Director of Innovation, Inuvialuit Science, and Climate Change

Communities Involved
Aklavik, Inuvik, Paulatuk, Tuktoyaktuk, Sachs Harbour, Ulukhaktok

Completion Status
Ongoing

Project Objective/Purpose
Spatial data is shared between the Department of Fisheries and Oceans, Joint Secretariat, Inuvialuit Game Council, Hunter and Trapper Committees, and Community Corporations, and maps and reports are disseminated.

Project Description
Data sharing between organizations in the ISR improves knowledge transfer and reduces duplicated effort. The Inuvialuit Settlement Region Platform was created for sharing of spatial data between Department of Fisheries and Oceans, Joint Secretariat, Inuvialuit Game Council. Hunter and Trapper Committees, Inuvialuit Community Corporations, and Inuvialuit Regional Corporation. It is also used by partner organizations for field surveys and for disseminating reports, maps, and dashboards.

IRC Mobile Research Laboratory

↑ Photo courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Jenn Parrott, IRC's Director of Innovation, Inuvialuit Science, and Climate Change
Ryan Mazan, Applied Research Manager
Shanay Williams, IRC's Research Administration and Programs Manager

Communities Involved
Aklavik, Inuvik, Paulatuk, Sachs Harbour, Tuktoyaktuk, and Ulukhaktok

Completion Status
Ongoing

Project Objective/Purpose
The IRC Mobile Lab aims to increase Inuvialuit capacity and self-determination in research by (a) providing the infrastructure to conduct highly technical and diversified research, (b) allowing Inuvialuit to lead research, determine research priorities, and be involved in research, (c) providing opportunities for IRC staff to mentor the next generation of Inuvialuit researchers, and (d) supporting the launching of an Inuvialuit-led Water Quality Research Program in the ISR.

➔ **Project description on page 34**

Project Description

The Mobile Lab is part of the ongoing efforts to develop research infrastructure in the Inuvialuit Settlement Region (ISR) and allow Inuvialuit to take an evidenced-based decision-making approach to policy development and advocacy to ensure the prosperity and wellness of Inuvialuit communities in the ISR.

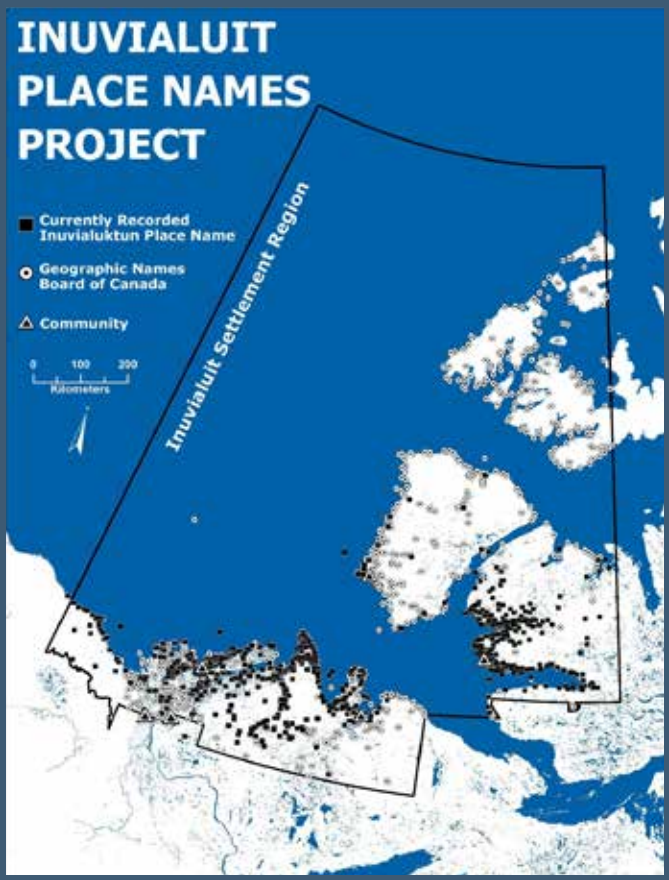
The Mobile Lab contains two structures: a lab unit for conducting research and a livable unit for researchers to rest while in the field. The structures are transportable to most land/ice locations within the ISR. The IRC Mobile Lab was designed to be powered by renewable energy (i.e., solar and wind) and is equipped with innovative technology to be operational year-round. The Mobile Lab will initially be equipped with a discrete analyzer and a gas chromatographer to test various environmental samples.

The research conducted in the Mobile Lab will be determined based on community needs as expressed by Inuvialuit. IRC has already hired Environmental Monitors, Wildlife Monitors, and Youth trainees to collect water and soil samples for testing. In February 2023, two Inuvialuit Environmental Monitors, one Wildlife Monitor, and one Youth were hired to collect lake water from Jimmy, Noell, Parsons, and Sitidgi lakes between Inuvik and Tuktoyaktuk. IRC will process these water and sediment samples in the Mobile Lab Instead of transporting them to southern laboratories for testing.

IRC would like to encourage community members and Inuvialuit Beneficiaries to use this innovative infrastructure to advance our research capabilities.

↑ Photos courtesy of Karla Kuptana, IRC Innovation, Inuvialuit Science and Climate Change Division

Inuvialuit Place Names Project (IPNP)



↑ Photos courtesy of Elizabeth Kolb, IRC Communications Division

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Ryan Mazan, Applied Research Manager

Communities Involved
Aklavik, Inuvik, Paulatuk, Sachs Harbour, Tuktoyaktuk, Ulukhaktok

Completion Status
Ongoing

Project Objective/Purpose
The goal of the Inuvialuit Place Names (IPN) project is to establish a centralized, Inuvialuit-controlled collection of all previously documented Inuvialuit place names.

Project Description
This collection of place name records will be securely maintained by the Inuvialuit Regional Corporation (IRC), with access to project results restricted to IRC agencies and their partners. Such detailed records will position the IRC to work with the Geographic Names Board of Canada to officially include Inuvialuit place names on national maps. The project will also act as a baseline from which additional place name research programs will be developed in the years ahead.

Over the centuries, Inuvialuit and their ancestors have given names to places of cultural significance. These names may reflect the kinds of activities that were carried out there, the kinds of resources an area is known for, or the events/people that are associated with those places, among numerous other commemorative reasons. Place names help to shape and define the cultural landscape and exist as an enduring record of Inuvialuit history and heritage.

➔ **Project description continued on page 36**

Project Description

Knowing place names and their meanings, the resources or landmarks at those locations, and the sequence of those place names as people journeyed along travel routes was one way that Inuvialuit learned to read the land prior to the influence of colonial lifeways. These locations are critically important to identifying key areas of significance within the ISR, and their continued use is an important aspect of Inuvialuit Culture. This initiative aims to identify, collect, overlap, and quality control Inuvialuit place names (both English and Inuvialuktun), which have been compiled from existing research and regulatory documents. The IPN project has been developed to take place cyclically, conducted over a series of six phases meant to be repeated on a semi-regular basis (see diagram below). The documentation of place name information is intended to be an ongoing process, capable of including new place name details as time passes and new stories about culturally significant locations are shared by Inuvialuit.

The first three phases of the IPN project have been completed (see the Project Cycle Diagram). This has resulted in the compilation of a large volume of place name records sourced from research and regulatory reports. While the Community Vetting Process (Stage 4) has been delayed due to the COVID-19 pandemic, interviews and language reviews have begun again and will continue into 2024.

The ISCC Division has secured project funding from Polar Knowledge Canada (POLAR), which is providing nearly $450,000 to support efforts on the IPN project.

This funding will ensure that the IPN project can meet its objectives, while providing a means of documenting Inuvialuit perspectives on the lands and waterways of the ISR through future project cycles, as shown in the Project Cycle Diagram below.

↑ Photos courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division

Carbon Pricing Study in the Inuvialuit Settlement Region (ISR)

↑ Photo courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Nipa Dutta, IRC's Clean Energy Program Coordinator

Shanay Williams, IRC's Research Administration Programs Manager

Jenn Parrot, IRC's Director of Innovation, Inuvialuit Science, and Climate Change

Communities Involved
Inuvialuit Settlement Region (Inuvik, Aklavik, Tuktoyaktuk, Paulatuk, Ulukhaktok, Sachs Harbour)

Completion Status
Complete (Phase 1 & 2 - 2019, Phase 3 - 2021)

Ongoing (Phase 4)

Project Objective/Purpose
The Inuvialuit Regional Corporation (IRC) is actively studying the impact of Carbon Pricing on Inuvialuit Communities within the ISR. Having already completed three phases of Carbon Pricing research, IRC is currently collaborating with relevant consultants to conduct a comprehensive cost-benefit analysis for this policy in the region. The new Carbon Pricing report will consolidate findings from the three previous IRC Carbon Pricing reports. This study will analyze economic data related to both "generated" and "recycled" revenue resulting from the Carbon Tax. The study also aims to provide research-based recommendations on how the Government of Northwest Territories should design policies to generate genuine economic benefits through the careful recycling of revenues.

Project Description

The Inuvialuit Regional Corporation (IRC) is deeply concerned about the impact of Carbon Pricing on Inuvialuit Communities. Since 2019, IRC has been conducting a comprehensive Carbon Pricing Impact Study to assess the potential effects of carbon pricing policies specifically within the ISR. The study aims to address the following key objectives:

1. Understanding Disproportionate Impact: The first two phases of the study primarily focused on market-based data. They revealed that benefits like the Cost-of-Living Offset (COLO) fall short of adequately covering the increased costs of household goods in the ISR. Additionally, these phases highlighted the disproportionate impact of the current Carbon Pricing implementation plan on Inuvialuit lifestyles, food security, and cultural practices.

2. Exploring the Traditional Economy: In Phase Three, IRC delved into the less-studied Inuvialuit Traditional Economy. This phase aimed to understand how carbon pricing might affect traditional hunting, fishing, and trapping practices—the backbone of Inuvialuit livelihoods. The findings underscored the need for a holistic approach to carbon pricing that considers both market-based and traditional economic activities.

3. Addressing Revenue Allocation: The concept of the economic cost of Carbon Pricing remains complex. Determining how carbon tax revenue should be spent to mitigate its impact on Inuvialuit communities is crucial. Phase Four of the study focuses on conducting a rigorous Cost-Benefit Analysis for Carbon Pricing Policy in the ISR. This evidence-based analysis will recommend optimal ways to recycle carbon tax revenue back into the ISR communities, ensuring their economic well-being.

4. Maximizing Economic Benefits: By collaborating with expert consultants, IRC aims to assess the revenue generated from the carbon tax within the ISR. The study will scrutinize how this revenue is reinvested in the local economy. Evaluating existing carbon revenue expenditures will provide insights into their alignment with goals such as reducing greenhouse gas emissions and promoting economic prosperity.

5. Strategic Recommendations: The study's phase four will propose strategic recommendations for the Government of the Northwest Territories (GNWT) on allocating carbon-pricing revenues. These recommendations aim to maximize economic benefits while safeguarding Inuvialuit well-being.

In summary, IRC's Carbon Pricing study serves as a vital tool for informed negotiations with federal and territorial governments. Its goal is to ensure a sustainable and healthy future for the Inuvialuit communities in the face of climate challenges.

A Case Study on Genomic Technology to Support Reindeer Management in the Inuvialuit Settlement Region

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Kyla Hvatum, Environmental Policy & Climate Change Assistant

Shanay Williams, IRC's Research Administration Programs Manager

Communities Involved
Aklavik, Inuvik, Paulatuk, Tuktoyaktuk, Sachs Harbour, Ulukhaktok

Completion Status
Ongoing

Project Objective/Purpose
The purpose of this case study is to conduct a thorough review of various genomic sequencing methodologies and tools to determine their applicability in addressing concerns related to reindeer species preservation, genetic diversity, and susceptibility to environmental stressors, including climate change, habitat loss, and infections. The data collected is intended to inform the present and future management of the IRC reindeer herd.

Project Description

This case study synthesized 77 peer-reviewed research articles published between 1992 and 2023 that advance (a) reindeer genome sequencing to classify the species, (b) genetic diversity to determine relatedness or adaptive capabilities, and (c) genomic sequencing on potential disease-causing vectors and pathogens affecting reindeer.

The literature researched in this case study came from research globally, though we mainly focused on areas around the world with ecosystems and climates similar to those found in the ISR. The research articles spanned several disciplines, including biotechnology, ecology, and genetic heredity. They covered themes such as phylogenetics, oncology, and immunology but also spanned disciplines like infectious diseases, pharmacology, archaeology, antibiotics, and antimicrobials. This research will be compared with current methodologies in the ISR to potentially expand the multidisciplinary approach to IRC's reindeer management protocols.

↑ Photos courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division

Energy Coordination for the Inuvialuit Settlement Region (ISR)

↑ Photo courtesy of Elizabeth Kolb (Photographer), IRC Communications Division

Organization Name
Inuvialuit Regional Corporation

Project Lead(s)
Nipa Dutta, IRC's Clean Energy Program Coordinator

Shanay Williams, IRC's Research Administration Programs Manager

Jenn Parrot, IRC's Director of Innovation, Inuvialuit Science, and Climate Change

Communities Involved
Inuvialuit Settlement Region (Inuvik, Aklavik, Tuktoyaktuk, Paulatuk, Ulukhaktok, Sachs Harbour)

Completion Status
Multi-year (Year 2 of 4)

Project Objective/Purpose
The goal of this project is to increase energy literacy and develop local capacity in the ISR through on-the-job training, workshops, community engagement, and implementation of the ISR Energy Action Plan. Increased capacity and active community participation in energy development across the ISR will contribute to eliminating energy poverty, achieving energy security, and transitioning towards Inuvialuit-owned autonomous energy systems that will benefit Inuvialuit for generations to come.

Project Description

The Inuvialuit Settlement Region (ISR) heavily relies on imported diesel fuel for heating and electricity, resulting in significant energy insecurity and higher energy costs. To address these challenges, the Inuvialuit Regional Corporation (IRC) is committed to developing sustainable and cleaner energy solutions. The goal is to create a more inclusive, healthy, and resilient future for ISR residents.

IRC aims to leverage local expertise by establishing an energy coordination team within the ISR. This team will include a Clean Energy Coordinator and seven additional support positions. The Clean Energy Coordinator has been active in the ISR for the past three years, successfully completing projects such as drafting a regional energy action plan based on community feedback. This plan addresses critical issues like high energy costs, supply chain risks, and environmental impacts due to climate change.

Initially, the project planned to create six Community Energy Champions—one for each ISR community. However, in the second year, IRC modified the approach. Instead of Energy Champions, they invested in creating six full-time Community Research Administrator positions (one for each ISR community). This strategic shift aims to build local capacity effectively. The team will support community research and energy development at both regional and local levels. Their tasks include developing training resources, promoting energy education, assisting Community Corporations with proposal writing, and facilitating community engagement. By involving the community, this coordination effort will enhance energy literacy, mentor youth, and drive evidence-based energy policies and research.

The project's outcomes will bridge capacity gaps hindering energy development in ISR communities. By prioritizing community-based training and involvement, this initiative seeks to eliminate energy poverty, achieve energy security, and transition to Inuvialuit-owned autonomous energy systems. In summary, this project ensures that community liaising and outreach remain central to energy development in the ISR, benefiting current and future generations.

↑ Photos courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division

Inuvialuit Settlement Region Research Projects

Inuvialuit
Community-led
Research Projects

Paulatuk Beluga Drone Project

Organization Name
Paulatuk Hunters and Trappers Committee (PHTC), Fisheries and Oceans Canada (DFO), University of Manitoba, Natural Resources Canada (NRCan)

Project Lead(s)
Kimberly Ovitz, Kevin Scharffenberg, Lisa Loseto, Joseph Illisiak Jr., Frank Wolki

Communities Involved
Paulatuk

Completion Status
Ongoing

Project Objective/Purpose
The purpose of this project is to use drones to collect aerial imagery of beluga whales in Darnley Bay to augment existing knowledge and observations of beluga site use, behavior, health and body condition, and group composition at key sites identified by knowledge holders. Imagery will be used to explore local knowledge on beluga through collective interpretation exercises.

Project Description

This project was initiated during research planning meetings between DFO and the PHTC in 2020. During these meetings, PHTC board members described observing beluga activities (e.g., rubbing, foraging, migration) in Darnley Bay that they were interested in documenting. While Paulatuk residents already possess extensive knowledge of beluga activity in their area, many of their observations are concentrated around specific sites and time periods (i.e., when hunters are active) and much of this information is not documented in accessible written or visual formats.

To address this, PHTC and DFO, with support from researchers at the University of Manitoba and NRCan, designed this project, which uses drone surveys in tandem with passive acoustic monitoring and group workshops to explore and document beluga activity in nearshore areas of Darnley Bay and the ANMPA. Survey sites and methods were designed during group workshops and by the field team, which consisted of two local harvesters and two Manitoba-based researchers. This approach has facilitated meaningful collaboration between research partners across all project phases and ensures the research process is guided by diverse forms of knowledge and expertise (i.e., Inuvialuit Knowledge and Western science).

After collecting imagery over two seasons (2021 and 2022), and in response to community observations of 'skinny whales' near Paulatuk in the latter, additional methods were added in 2023 to assess beluga health and body condition. Drone surveys were once again implemented at key sites identified by knowledge holders including in Paulatuk Harbour and at Billy's Creek, Egg Island, Argo Bay, Miluksuk, Bennett Point, Kamakark, and Cape Lyon. The imagery collected in 2023 is currently being compiled and edited in preparation for interpretation workshops to be held in Paulatuk in spring/summer 2024.

↑ Photos courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division


Paulatuk Beluga Drone Project Study Sites
Beaufort Sea
ANMPA
Johnny Green's Bay
Kamakark
Cape Lyon
Franklin Bay
Bennett Point
Miluksuk
Darnley Bay
Argo Bay
Billy's Creek
Paulatuk

Gamification of Climate Change Adaptation: Traditional Inuit Games and Land Based Skills for Navigating Ice Safety

Organization Name
University of Waterloo, Northern Games Society, and Inuvialuit Communications Society

Project Lead(s)
Katarina Kuhnert (lead researcher)
Donald Kuptana (Northern Games Society)
Tamara Voudrach (Inuvialuit Communications Society)
Dr. Michelle Rutty (research supervisor)

Communities Involved
Inuvik and Tuktoyaktuk

Completion Status
Complete (Single-year)

Project Objective/Purpose
This project explores the application of Northern Games as a climate change adaptation tool to address safety on the land as a climate change adaptation priority area in the Inuvialuit Settlement Region Climate Change Strategy. This applies to the goal of developing mechanisms to ensure travel across ISR lands and waters is safe, as Northern Games are traditional Inuit games developed to practice the skills required to survive on the land.

➔ **Project description continued on page 50**

↑ Skills Transmission Framework for land based skills through Games play.

Project Description

This project explores the application of Northern Games as a climate change adaptation tool. Northern Games are traditional Inuit games developed to practice the skills required to survive on the land. This study addresses the documented types of Games and Game play, the categories of skill conveyed through the Games, the application of those skills on the land for ice safety, and the effectiveness of Northern Games Events for transmitting these skills. Archival literature, event programs, and publicly listed interviews with Northern Games Society members, officials, and coaches were analyzed with a focus on the Inuvialuit Settlement Region. In total, 132 Games are described, contributing to physical, mental, and life skill development. Games events effectively transmit ice safety skills through high kicking and kneel jump, while triple jump requires more investigation. Sportification, banning of certain Games, and a lack of documented material were identified as barriers to the use of Games in adaptation. A skill transmission framework was designed to support an expanded application of the Games for adaptation. This study concludes that, as ice conditions continue to be degraded by the changing climate, the transmission of skills practiced through the Games is relevant to addressing gaps in ice safety skill development. The Northern Games present a pathway for climate change adaptation rooted in the mental and physical strength of Inuvialuit themselves. The gamification of climate change adaptation offers a play-based model for navigating ongoing and unprecedented environmental conditions. This model holds strong potential for application in Indigenous communities across the circumpolar northern region and beyond.

↑ Photos courtesy of Elizabeth Kolb, Inuvialuit Regional Corporation's Photographer & Communications Advisor, IRC Communications Division

Community-led muskox and caribou health surveillance in the Inuvialuit and Kitikmeot regions

↑ Mentor Allen Pogotak (right) and youth Markus Kuptana (left) collecting droppings from a muskox during the Muskox Harvesting and Sampling Camp organized in Ulukhaktok in April 2023.

Organization Name
Olokhaktomiut Hunters and Trappers Committee (OHTC), Kugluktuk Angoniatit Association (KAA), Ekaluktutiak Hunters and Trappers Organization (EHTO), Kutz Research Group (University of Calgary)

Project Lead(s)
OHTC Board, Amanda Dumond (KAA), Beverly Maksagak (EHTO), Fabien Mavrot, Susan Kutz

Communities Involved
Ulukhaktok, NWT
Kugluktuk and Cambridge Bay, NU

Completion Status
Ongoing

Project Objective/Purpose
Our goals are to proactively monitor the health status of muskox and caribou populations on Victoria Island and the adjacent mainland, and to detect population changes and emerging health concerns early so that appropriate human health and wildlife management responses can take place in a timely manner.

➔ **Project description continued on page 52**

Project Description

Muskoxen and caribou are two important species that provide food, employment, and income for Inuit and First Nations communities in Canada. However, during the past 20 years, populations of these animals across the Kitikmeot and Inuvialuit regions have declined dramatically, in large part due to disease emergence. These muskox and caribou populations are now at such low points that both subsistence and guided hunting opportunities are at risk.

Since 2016, we have been working together with the Olokhaktomiut Hunters and Trappers Committee (OHTC) and Government of Northwest Territories Environment and Climate Change to monitor the general health of local muskox and caribou populations, and to better understand the reasons for these declines. We aim to identify indicators that can tell us how the population is going to change in coming years. We are also conducting similar monitoring in Cambridge Bay and Kugluktuk to obtain a broader picture of what is happening on Victoria Island and the adjacent mainland.

To achieve this, we have implemented a hunter-based sampling program that collects (a) data from animals harvested for subsistence and for income (guided hunting) and (b) local hunter and guide/outfitter knowledge.

So far, important results from this ongoing project have identified several concerns for Ulukhaktok area muskoxen, including:

1. decreased muskox populations directly around the community and along Prince Albert Sound, with smaller group sizes and fewer calves in recent years;

2. low levels of some trace elements, such as selenium (note: trace elements are ingested with food and are important for many body functions, including growth, immunity, and reproduction);

3. increased occurrence of brucellosis, a disease that can affect muskoxen as well as people who handle and eat infected raw meat;

4. low pregnancy rates (based on testing of muskox blood samples collected by harvesters);

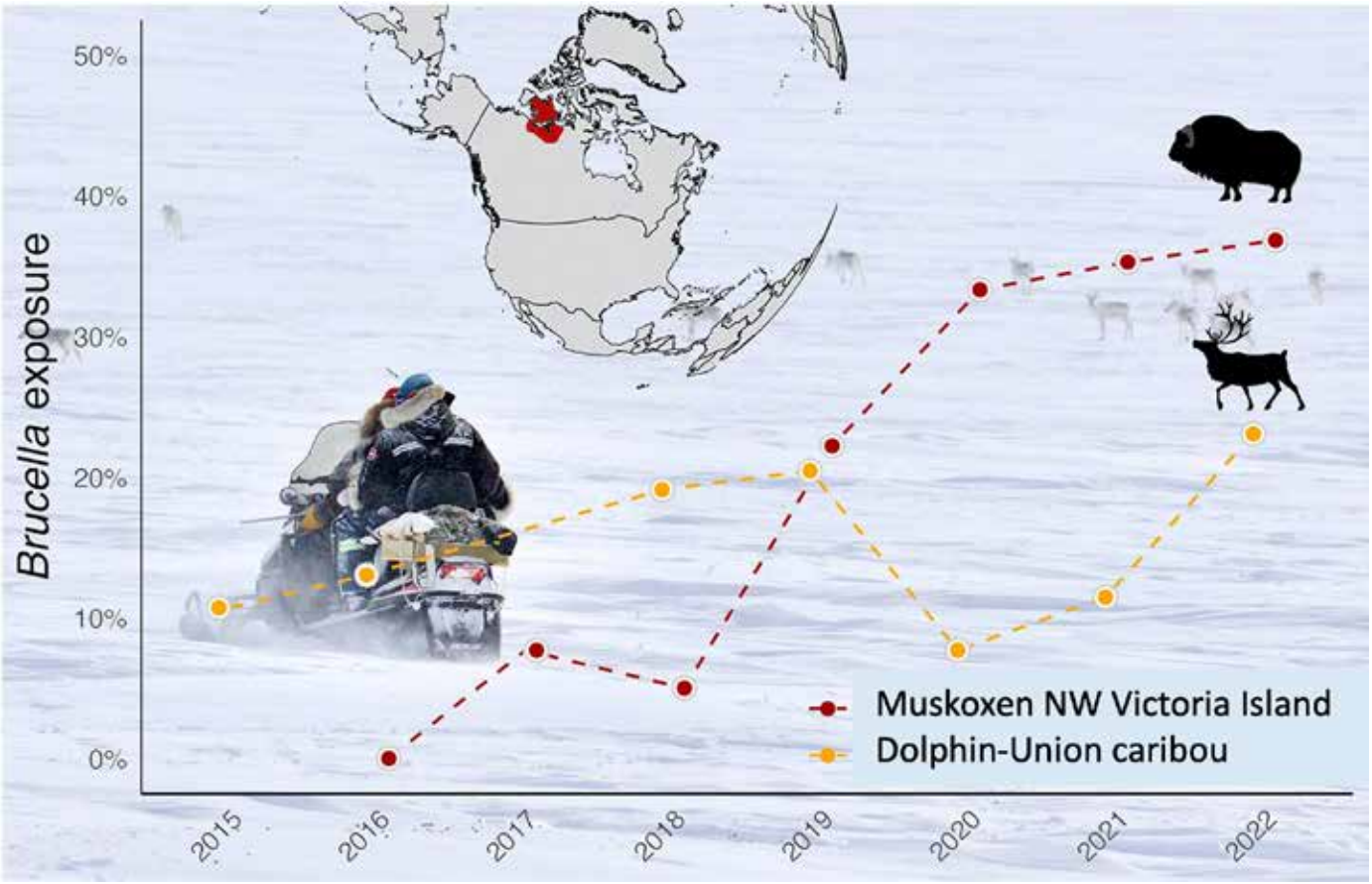
5. high rates of front teeth breakage compared with mainland muskoxen; and

6. multiple muskox mortality events observed by harvesters in 2007-2012 (note: these are likely connected to similar muskox die-offs that were documented by the communities of Sachs Harbour [Banks Island] and Cambridge Bay [Nunavut side of Victoria Island] at the same time).

Results from the analyses have shown that the Dolphin and Union (DU) caribou herd has higher pregnancy rates and better body condition now than they did just before the documented decline in numbers (based on aerial surveys in the 2000s). Evaluation of a stress hormone (cortisol) in caribou hair indicates that DU caribous have a higher baseline stress level and lower levels of key trace elements than the Bluenose East herd; however, the average stress level of DU caribou has been decreasing in the past few years.

Finally, our analyses show that DU caribou exposure to many pathogens has decreased in recent years. One notable exception is brucellosis, which seems to be stable in the herd (10% to 15% of animals have been exposed to the disease). Findings also suggest that brucellosis might be associated with reduced fertility and survival in female DU caribou.

↑ We are seeing muskoxen from Victoria Island with severe cases of incisor breakage. We have been examining these breaks as well as x-raying the teeth to look for the impact on root and jawbone health. The circled root in the X-ray shows an abscess or infection that is deteriorating the surrounding tissue and bone. These breaks would be very painful for the animals and can disrupt adequate food intake that is needed to maintain good body condition and reproduction.



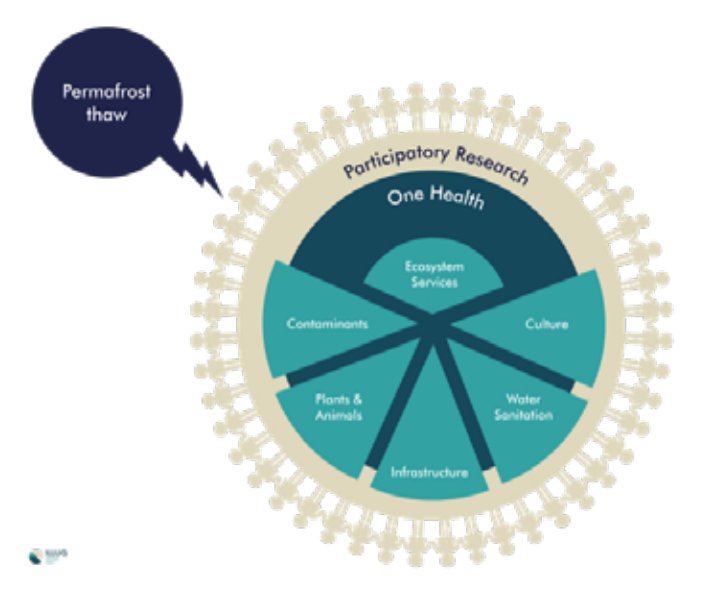
↑ Results for samples collected by hunters (plus caribou samples from government collections) in areas around Ulukhaktok, Kugluktuk, and Ekaluktutiak (from Aguilar et al. 2024). Blood samples from caribou were tested for exposure to brucellosis. Brucella exposure rates in muskoxen have increased considerably since 2015, while the rates in caribou have fluctuated over time.

Inuvialuit Settlement Region Research Projects

Academic Organizations' Research Projects

ILLUQ: Permafrost – Pollution – Health

Website (upcoming): Illuq.eu



↑ Reindeer Station, photo credit: Aurora Research Institute. "Monitors completing snow surveys on one of the landslides."

Organization Name

The project is hosted at the Alfred Wegener Institute in Potsdam, Germany with partners and collaborators in eight European countries as well as in Canada, Svalbard and Greenland. It will run for four years from January 1, 2024 through to December 31, 2027 and is coordinated by Professor Hugues Lantuit.

Project Lead(s)

Prof. Hugues Lantuit, E-mail: Hugues.Lantuit@awi.de
Prof. Moritz, Langer, E-mail: Moritz.Langer@awi.de
Prof. Arja Rautio, E-Mail: arja.rautio@oulu.fi
Dr. Justine Ramage,
E-Mail: justine.ramage@nordregio.org
Mag. Susanna Gartler,
E-mail: susanna.gartler@univie.ac.at

Communities Involved

Aklavik, Tuktoyaktuk, Inuvik, Shingle Point, Herschel Island

Completion Status

Ongoing

Project Objective/ Purpose

ILLUQ will provide the first holistic approach to permafrost thaw, pollution, health and well-being in the Arctic. The project will deliver timely products on the risks from contaminant release, infrastructure failure and ecosystem changes. ILLUQ will assess Arctic permafrost contaminants, permafrost degradation's impact on ecosystems, livelihoods, and on infrastructure. Further, the project will investigate health risks from climate change on freshwater resources, explore cultural perspectives on permafrost, and map ecosystem services. ILLUQ will also identify nature-based solutions that can be shared across the study areas. Finally, this multidisciplinary knowledge will be integrated into a "One Health" framework.

Project Description

Permafrost underlies 22% of the Northern Hemisphere's exposed land surface and is thawing at an alarming rate as a direct consequence of climate change. Permafrost thaw releases large quantities of organic matter and contaminants into the environment. Contaminants, including heavy metals, persistent organic pollutants, and microbiological agents locked in permafrost, are a risk for both human and animal health. In addition, permafrost thaw dramatically impacts infrastructure in local communities, with wide-ranging consequences for health, economy, and society. Yet the social, physical and health components of permafrost thaw have traditionally been studied in isolation, leading to inadequate policy options that ignore the holistic nature of the threat. ILLUQ is an interdisciplinary project rooted in participatory research with local stake- and rights holders. Its mission is to tackle the need for an integrated and participatory approach to the complex issues at the overlap between climate change, permafrost thaw, infrastructure damage, contaminants, health and well-being,and for solutions founded on the cultural, natural, and social frameworks of local communities. ILLUQ builds on long-term existing research relationships in all three study regions (Greenland, Svalbard and in Northwestern Canada - specifically in the ISR and Gwich'in Settlement Area (GSA)), such as the "Nunataryuk" project. ILLUQ's endeavor is a direct answer to the pressing needs of communities on potentially disappearing permafrost. It targets the missing link between studies performed by scientists, engineers and consultants in local communities and solutions with local stake- and rights holders focusing on the long-term implications of decision-making in the context of permafrost thaw, a time frame generally overlooked in existing governance frameworks.

Country Foods for Good Health: Promoting foods in the Inuvialuit Settlement Region that Reflect Inuvialuit Culture, Knowledge, and Values (Country Foods for Good Health: Phase Two)

↑ Ringed seal liver, muscle and fat samples from Ulukhaktok shown before processing at the University of Waterloo. These samples were cooked, freeze-dried and ground up before being sent with the other food samples to different labs across Canada.

Organization Name
University of Waterloo

Project Lead(s)
Sonja K. Ostertag, Kelly Skinner, Brian Laird

Communities Involved
Aklavik, Inuvik, Paulatuk, Sachs Harbour, Tuktoyaktuk, Ulukhaktok

Completion Status
Ongoing

Project Objective/ Purpose
Phase Two of the Country Foods for Good Health included all six communities of the Inuvialuit Settlement Region (ISR). This project aimed to(1) co-create country food profiles to share how healthy country foods are in each community; (2) understand Inuvialuit values and preferences related to food and dietary messages;, (3) determine preferences for communication about food; and (4) co-develop communication materials that reflect Inuvialuit culture, knowledge, and values.

Project Description

In Year Three of Phase Two, numerous research activities took place in the six communities of the ISR. Country food samples were collected and analyzed, interviews with Elders were completed, surveys with students and adults were administered, talking circles and interpretation workshops with Youth and Elders were conducted, and workshops and animal/recipe books were completed.

In Phase Two, country food samples were collected through community-based sampling led by community research leads in Aklavik, Inuvik, Sachs Harbour, and Ulukhaktok. The analysis of these samples complements work completed in Paulatuk and Tuktoyaktuk for Phase One of the project. Our analysis of country foods reinforces traditional knowledge that country foods are very healthy. Country foods are good and excellent sources of micronutrients (minerals, vitamins, polyunsaturated fatty acids). Our analysis of health risks from contaminants suggested a low risk for most people. The health risks from zoonotic diseases in harvested species (i.e., diseases that can be passed from animals to humans) are important to monitor because diseases are emerging with warming temperatures and changes in species migration. Dietary advice will be developed to support healthy diets in the ISR based on the results from this study and community feedback.

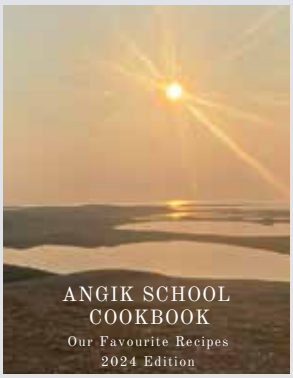
Storytelling interviews with Elders provided valuable information about Inuvialuit knowledge, values, and preferences about country foods. School workshops, a student survey, a youth photovoice project, and five school projects provided opportunities for children and youth to learn and share their perspectives. Country foods and associated cultural and traditional activities continue to be key to Inuvialuit youth and Elders' food security and well-being. However, both generations expressed concern around climate change, and Elders noted concerns about contaminants in country foods among their food sharing networks. Students in the ISR reported a strong preference to eat, harvest, and prepare caribou, a high interest in harvesting activities, and a strong desire to learn from their families.

Communities participated in the Inuvialuit Food Messages Survey to evaluate the effectiveness of current dietary messages and learn how to share information about food and health. Respondents were confident in the quality and safety of country foods and were active in many harvesting activities, despite the majority having heard about contaminants in traditional foods. Elders, friends, and family were identified as the most trusted to share knowledge about food quality, safety, and diet. On the land programs as well as programs with Elders and harvesters were identified as the most preferred ways for learning about healthy foods in the ISR.

Results were co-interpreted and communicated with the communities of Aklavik, Paulatuk and Tuktoyaktuk. Results were discussed with the Olokhaktomiut Hunters and Trappers Committee and Ulukhaktok Community Corporation. Results will be reviewed and shared with Inuvik, Sachs Harbour and Ulukhaktok in 2024.

Community Research Leads led or co-led all research activities in their communities and ensured the success of the project. Engagement with youth in schools celebrated Inuvialuit recipes and fostered knowledge-sharing between Elders and Youth. This project supports the co-development of resources that promote healthy foods reflecting Inuvialuit culture, knowledge, and values.

It is a privilege to do this work in the ISR and we are thankful for the support and participation in all six communities. We are waiting on funding for Phase 3. Phase 3 will give us the chance to create seasonal harvest calendars in each community, learn more about local diets and share results in meaningful ways.



↑ Cookbook and animal book covers for five books prepared in the ISR during Phase 2 of ***Country Foods for Good Health***.

Paleoecology of the Mackenzie River Uplands Region

↑ Two researchers taking an Ekman Grab on a small lake near the Inuvik-Tuktoyaktuk Highway, close to Inuvik/ Annabe U. Marquardt

Organization Name
Dalhousie University

Project Lead(s)
Dr. Andrew S. Medeiros and Annabe U. Marquardt

Communities Involved
Inuvik, Tuktoyaktuk

Completion Status
Complete

Project Objective/Purpose
We used sediment and water samples to understand environmental relationships between aquatic macroinvertebrates and climate in lakes across the Mackenzie River uplands region. Our main research objectives are to determine the environmental factors that explain differences in chironomid (Insecta:Diptera:Chironomidae) assemblages across the region and explain habitat preferences. This work is important to try to understand environmental controls on aquatic macroinvertebrates that are used as indicators of environmental change.

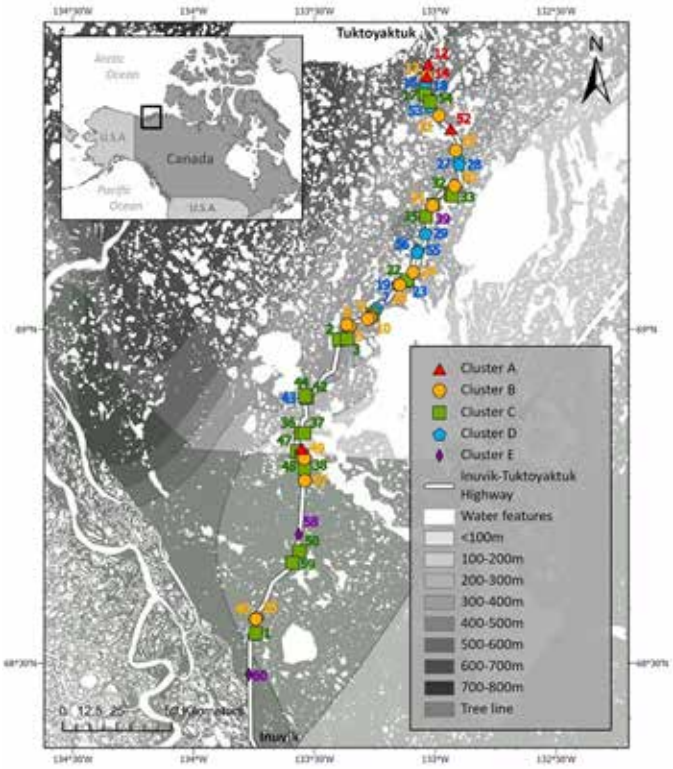
➔ **Project description continued on page 62**

Project Description

Arctic freshwater ecosystems are vulnerable to climate-induced stress. Ongoing permafrost degradation within the Mackenzie uplands region alters the transport of dissolved organic carbon and nutrients to aquatic systems. Chironomids, the most common macro-invertebrates in Arctic lakes, are sensitive to changes in their aquatic habitat and are therefore commonly used in climate research, with the main focus on lake temperature reconstruction.

We examined sediments and water samples from 60 lakes within 200 m distance from the Inuvik-Tuktoyaktuk Highway to investigate the relevance of habitat and lake morphology in explaining within-region differences in chironomid distribution. In July 2022 and 2023, four researchers from Dalhousie University and two collaborating researchers from Northwestern University collected surficial sediment and water samples using a six-foot Zodiac, a Uwitec Gravity Corer, and an Ekman Grab. The sediment samples were analyzed at Dalhousie University in Halifax and the water samples were analyzed at Northwestern University in Chicago. The distribution of chironomids assemblages across lakes is strongly influenced by catchment characteristics (such as runoff, mean annual precipitation, and vegetation and soil types) and lake morphology (the shape and volume of a lake), as shown by variability in conductivity, total phosphorus, and dissolved organic carbon. We found five statistically different clusters of lake habitats within our dataset; different chironomid assemblages were observed in lakes that are very shallow and clear, compared to lakes that are high in mineralization, very marshy, thermokarst, or strongly vegetated within the lake and catchment.

To more accurately explain environmental responses to climatic developments, these findings imply that future research should include careful assessments of within-region variability when reconstructing chironomid-derived temperature gradients.



↑ Sixty sampling sites between Inuvik and Tuktoyaktuk, within 200m from the Inuvik-Tuktoyaktuk Highway, arranged by lake cluster (A-E), shown in relation to permafrost gradient and tree line.

The Effects of Disturbance on Green Alder and Dwarf Birch Health and Productivity in the Low Arctic Tundra

↑ Two researchers taking an Ekman Grab on a small lake near the Inuvik-Tuktoyaktuk Highway, close to Inuvik/ Annabe U. Marquardt

Organization Name
Wilfrid Laurier University

Project Lead(s)
Dr Jennifer Baltzer, Dr Cory Wallace, Claire O'Brien

Communities Involved
Inuvik (through Inuvik Hunters and Trappers Committee)

Completion Status
Complete

Project Objective/Purpose
Woody shrubs have been thriving and expanding in the tundra because of the effects of climate change. The purpose of this project is to find out how naturally-occurring disturbances like landslides caused by permafrost thaw affect the productivity of alder and birch shrubs. We were also interested in whether changes in productivity influenced decomposition (the breaking down of shrub leaves). Understanding changes in shrub productivity is important because shrubs can alter the plant species near them, influence the carbon cycle, and change how snow moves across the land and melts in the spring.

➔ **Project description continued on page 64**

Project Description

This project is led by student researcher Claire O'Brien from Wilfrid Laurier University in Ontario and supervised by Dr. Jennifer Baltzer and Dr. Cory Wallace. It is a 2-year research project that is now almost done. The project looks at small to medium-sized bushy plants or shrubs and their productivity within disturbances to permanently frozen soil or permafrost. The shrubs we studied drop their leaves in the winter, so we also looked at how their leaves decompose. Two different permafrost disturbances were studied: thaw slumps (landslides caused by thaw) and polygonal terrain (patterned ground caused by underground ice wedges freezing and thawing).

The location for the research was between 20 – 70 km north of Inuvik along the Inuvik-Tuktoyaktuk Highway (ITH). Some sites were located near the Trail Valley Creek research station, 50km north of Inuvik. A wildlife monitor from the Inuvik Hunter and Trappers Committee (HTC) was hired as a member of the team. Our team hiked out to disturbances within 1km of the highway. We measured shrub productivity by recording characteristics of shrubs, such as leaf area and height. Each disturbance site was visited twice, once in the summer and once in the fall.

In the summer, we collected leaf and wood samples so we could understand how these characteristics were related to the health and productivity of the alder and birch. We compared our samples to see if the plants' health and productivity differed between disturbed and undisturbed tundra.
In the fall, we collected leaves and soil from the same alder and birch plants to see how fast the leaves break down or decompose with help from the microbes in the soil. We transported the soil and leaves to Ontario where we measured the leaf decomposition in a laboratory experiment.

Our results show that shrubs within landslides were larger and more productive compared to those on the undisturbed tundra. In the polygonal terrain, the characteristics of shrubs were not different. We also found from our lab experiment that leaves from disturbances decomposed more when paired with soil from disturbances. This could mean that disturbances are less likely to return to their original conditions and that shrubs can dominate those areas instead of tundra plants like caribou lichen, aqpik (cloudberries), and cranberries. Our results also show that shrubs might not be helping to absorb carbon from the atmosphere as much as expected because the leaves they drop are decomposing quickly in disturbances.

Carving out Climate Testimony': Inuit Youth, Wellness & Environmental Stewardship'

↑ Two researchers taking an Ekman Grab on a small lake near the Inuvik-Tuktoyaktuk Highway, close to Inuvik/ Annabe U. Marquardt

Organization Name
University of Saskatchewan, Newcastle University

Project Lead(s)
Dr. Karla Jessen Williamson and Dr. Jen Bagelman

Communities Involved
Tuktoyaktuk, Northwest Territories

Completion Status
Ongoing (Three-year project, funded by CINUK)

Project Objective/Purpose
This is the final year of a three-year project with a community-driven approach that views Inuvialuit youth as pivotal agents of change rather than those who are 'at-risk'. Four Inuvialuit youth are leading the research that they feel directly affects their community and their people. Our project addresses this pressing issue by examining how these ecological changes are impacting the mental health and well-being of Inuit communities (Willox et all., 2020; IRC, 2016). Working alongside Inuit artists, we explore how long-standing practices of storytelling can be used as a material and intergenerational method to convey climate testimony and shape policy that enhances resilience strategies.

Project Description

This two-fold question is what keeps everyone guided in the research: How does climate change impact Inuit youth and what are the resilience factors that enhance mental health and well-being?

Our program is near the end; our Inuvialuit youth have completed their workshops and TukTV episodes about climate change, and they are editing the material they have gathered. Among their activities were the following: traditional arts-based workshops, followed up with a climate change workshop with Inuvialuit artist Brian Kowikchuk; completing an Inuit Youth Advisory halfway through the program, and are preparing to present to the Canada-UK team and showcase their findings at their third and final annual youth-led gathering ' Climate Conversations: Bridging Worlds', a two-day event in Victoria, B.C. given the UN Hub: connecting youth participants, community-members, academics, and policy-makers. Led by Inuvialuit youth, these workshops enable thoughtful conversation about climate change and mental health.

At this meeting, the youth will present their data to all participating researchers, including Dr. Karla J. Williamsons Inuvialuit Graduate Research Assistant Dwayne T. Drescher "Atjgaliaq". His involvement enables Inuvialuit to participate inevery phase of the program, including participatory led research, data collection and analysis, cooperative research, working with Inuvialuit artists, and showcasing their findings. Three distinguished post-secondary institutions—the University of Saskatchewan, the University of Victoria, and the United Kingdom University—will lead the analysis of the research that has been compiled from the data collected by the Inuvialuit youth. Their findings will be peer reviewed with the Hamlet of Tuktoyaktuk and the Inuvialuit Regional Corporation before being published and shared with the world.

Bridging Science and Traditional Knowledge in Alignment with Marine Conservation Targets

Organization Name
Live It Earth

Project Lead(s)
Mike Irvine, Maeva Gauthier, David Russell-Loewen

Communities Involved
Tuktoyaktuk (Beaufort Sea) and Aklavik (Mackenzie Delta)

Completion Status
1 of 2 programs complete - ongoing through 2024

Project Objective/Purpose
This knowledge mobilization project centred around the Beaufort Sea area and the Mackenzie Delta within the Inuvialuit Settlement Region focuses on marine and coastal scientific and Traditional Knowledge. Given the unprecedented climate change impacts, including coastal erosion and changing sea conditions, effective communication of research findings becomes crucial. To achieve this, the project combines scientific research from Natural Resources Canada (Dustin Whalen) and the Department of Fisheries and Oceans (Lisa Loseto) with Inuvialuit Traditional Knowledge. It also establishes a connection for ongoing youth involvement and emphasizes the importance of marine conservation and ocean literacy.

Project Description
This project is in collaboration with local Hunter and Trapper Committees (HTC) and schools in the Beaufort-Delta Division - engaging youth, building community capacity, and even supporting local filmmakers in creating a holistic educational program for grades K-9. By involving youth, the project fosters their active participation and empowers them to become advocates for marine conservation. It also contributes to building community capacity by providing activities and resources to enhance knowledge and understanding of marine and coastal issues and support subsistence harvests.

This project aims to create an education program that equitably and effectively communicates the importance of marine conservation and addresses the challenges posed by climate change across Arctic communities of the Inuvialuit Settlement Region.
Please follow the progress and engagement by signing up with free access - https://app.liveit.earth/register and using the coupon code BDDEC-23.

Understanding the Extreme Snow Conditions of the Winter of 2023-24 in the Inuvialuit Settlement Region

Organization Name
Wilfrid Laurier University

Project Lead(s)
Philip Marsh

Communities Involved
Inuvik and Tuktoyaktuk

Completion Status
Ongoing

Project Objective/Purpose
A keystone feature of the Arctic is the snow cover that impacts all aspects of the environment, including lake ice thickness, lake levels, streamflow and fish habitat. However, measuring the Arctic snowscape is prone to extremely large errors. For example, measured snowfall is typically much less than actual snowfall and end of winter snow on the ground. This is a significant problem as understanding snow on the ground is required to understand the impacts of climate change on the Arctic. Given this, the objective of this project is to improve our ability to measure all aspects of the Arctic snowscape.

Project Description
To solve this challenge, our interdisciplinary and international research team carried out a unique study that used novel instrumentation, including upward looking weather radar to measure snowfall; blowing snow detectors; systems to measure sublimation of snow over the winter; sensors to measure the accumulation of snow on the ground; drones, aircraft and satellites to map snow on the ground; and new stream discharge methods at the Wilfrid Laurier Trail Valley Creek research watershed located north of Inuvik, NWT. When combined with a new snow prediction model, we will be able to quantify all aspects of the Arctic snow environment across over the full 2023-24 fall/winter/spring season. This project has detailed how extreme the study year was in terms of snowfall, blowing snow, and snow accumulation, and will result in new methods to measure and predict Arctic snow cover that can be applied across the Canadian Arctic in order to understand the impact of climate change on the Arctic environment.

www.trailvalleycreek.ca

The NSERC CREATE "LEAP" Program's Northern Field School: Training tomorrow's LEAders in Permafrost thaw and Northern Research

(Area of Research: Permafrost)

Organization Name

Collaborating organizations leading & attending the LEAP Northern Field School:

1. University of Alberta
2. Université de Montréal
3. McGill University
4. University of Victoria

Partner organizations supporting LEAP's Northern Field School activities:

1. Inuvialuit Land Administration
2. Northwest Territories Association of Communities
3. Government of Northwest Territories

Project Lead(s)

The LEAP Northern Field School Leaders:

-Duane Froese, University of Alberta
-Alejandro Alvarez, University of Alberta
-Steve Kokelj, Northwest Territories Geological Survey
-Suzanne Tank, University of Alberta
-Oliver Sonnentag, Université de Montréal

Communities Involved

Inuvik: The LEAP Northern Field School is based out of Inuvik from July 20th-29th, 2024, with travel to nearby permafrost landscapes, research locations, and other communities.

Tuktoyaktuk: The LEAP Northern Field School participants plan to travel to Tuktoyaktuk to learn about how permafrost thaw is impacting community residents and their infrastructure.

Completion Status

Ongoing (The LEAP program is multi-year, whereby we are in year 1 of 6). It began in September 2023 and will continue until August 2029. LEAP aims to offer a Northern Field School training event each year of the program, and this July will be the first year it is offered.

Completion Status

LEAP is a training program that aims to equip students and professionals with the fundamental knowledge, professional skills, and northern experience required for permafrost thaw related careers in the North. This program hopes to contribute to a more climate-resilient Canada by meeting northern needs collaboratively with Northern communities seeking to understand and adapt to permafrost thaw challenges. By connecting people with diverse experience in this interdisciplinary topic, this program will foster personal relationships among participants, while learning from each other about how we think about permafrost in the North.

Project Description

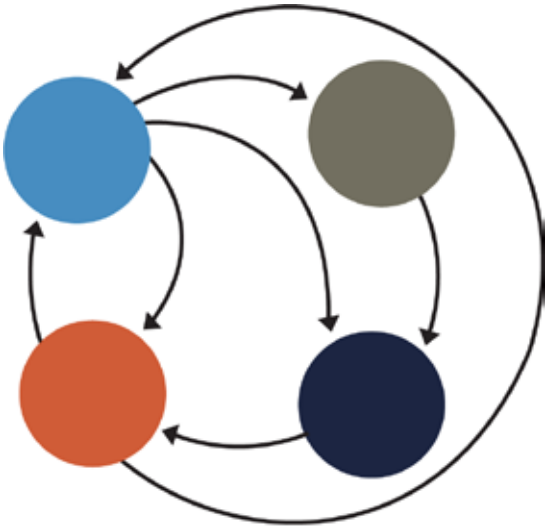
The LEAP program is visiting Inuvik and Tuktoyaktuk this summer to learn about permafrost thaw. From July 20thto 29th, 2024, the LEAP program is hosting a Northern Field School event for its trainees and any community members looking to participate in daily activities focused on understanding and adapting to changing permafrost landscapes. This event integrates excursions, practical training, student project presentations, and community-led learning. Within the first week, participants will learn about recognizing permafrost features, practicing permafrost monitoring, and understanding permafrost thaw adaptation needs and current initiatives. In the final three days, LEAP's trainees will work alongside a mentor to complete small-scale research projects that address community-identified permafrost priorities. These projects will be presented and delivered back to project partners.

Funded through the Natural Sciences and Engineering Research Council of Canada's (NSERC) Collaborative Research and Training Experience Program (CREATE), as well as through partnering institutions, the LEAP program trains scientists with the ability to work and engage in permafrost research in a northern context. LEAP began in September 2023 and is a multi-year program that will continue until August 2029. This project is hosted by Carleton University, with collaborating researchers and partners including Duane Froese, Alejandro Alvarez, Suzanne Tank (University of Alberta), Oliver Sonnentag (Université de Montréal), and Steve Kokelj (Northwest Territories Geological Survey) as its Northern Field School event leaders. LEAP's Northern Field School's design and implementation is also supported by northern partners such as the Inuvialuit Land Administration, the Government of Northwest Territories, and the Northwest Territories Association of Communities.

Starting once again this September 2024, LEAP will also be offering its Online Training Course until March. This course includes weekly seminars about permafrost science topics ranging from thermal modelling, mapping, and geologic history, to field safety, working together collaboratively, and knowledge co-creation. Sessions include an interactive activity and the opportunity for discussion to hear from all participants' perspectives. Each week features a different expert to share their ideas and experience in permafrost research.

For anyone interested in officially joining the program for its second year, LEAP is now welcoming additional trainees to participate in its Online Training Course and/or its Northern Field School. Reserving ten spaces preferentially each year for those based in the North, this program is open to any students, professionals, or community members involved in permafrost research or interested in learning more. The second year of the program begins in September 2024, and more details are available on the program website at www.permafrost-leap.ca.

Please reach out to us if you are interested in finding out more about LEAP's Northern Field School and in participating in this event. Please also be in touch if you are interested in applying to the LEAP program or discovering more about the program's structure. To stay up to date about our activities throughout the upcoming Northern Field School and as we continue delivering the LEAP program, you can also follow us on Instagram (@nserccreateleap) and LinkedIn ***(https://www.linkedin.com/company/nserc-create-leap/)***.



CREATE LEAP
NSERC | CRSNG

Inuvialuit Settlement Region Research Projects

Federal Government's Research Projects

A Recognized Need for Growing Northern Economies and Safer Personal Protective Equipment for Government of Canada Employees

↑ Visual Abstract of the project's focus courtesy of the Western ArcCc Youth Collective.

Organization Name
Western Arctic Youth Collective; report prepared for the National Research Council of Canada and Aurora Research Institute

Project Lead(s)
Autumn Schnell; Research license held by Anne Barker

Communities Involved
Ulukhaktok

Completion Status
Complete

Project Objective/Purpose
Government of Canada (GoC) employees are issued clothing such as hats, boots, mittens, and more as Personal Protective Equipment (PPE) to keep them warm while working in the North. Employees feel their PPE could be improved through Indigenous Knowledge (IK), by incorporating Indigenous-made clothing. This project examined preferences for PPEand construction, care, and longevity of Indigenous-made clothing through interviews and a survey. It proposes that by having GoC departments purchase Indigenous clothing, northern economies for craft producers will be strengthened and PPE will be improved.

Project Description

IK provides leadership when it comes to protecting people from the elements in northern, often harsh, environments. Canada's northern residents have hundreds of years of successful development of clothing to protect themselves from the environment. Traditional Indigenous garments were developed with natural items, through observations that the component materials have properties that promote water resistance, wicking, and heat retention, all properties required for northern survival. GoC departments with operational requirements in the Arctic have commented that the typical clothing worn by their staff are a limiting factor for successful operations in the North. Frostbite, hypothermia, and challenges with basic usability of equipment with bulky outerwearare all problems faced by personnel. With a need for safer workwear for GoC staffand recognizing an opportunity for northern craft producers, as proprietors of small enterprises that develop and produce PPE, a research project was developed to address these considerations, divided into two phases. In the first phase, a laboratory evaluation of the thermal insulation of traditional ensembles, such as outerwear, parkas, mittens, boot liners, etc., was performed and reported upon in Barker et al. (2022).

In the second phase, working closely with IK holders, interviews were conducted about the key properties that make these ensembles strong performers in harsh conditions, including examining use, construction, properties and preferences for clothing used in a northern environment. Through interviews or surveys with craft producers, GoC staff, Canadian Coast Guard Auxiliary and Ranger volunteers, the benefits and preferences with respect to using northern Indigenous-made clothing were highlighted. GoC staff interviewed almost universally supplemented their issued clothing and PPE in order to stay warmer at work. Those same staff members are interested in the opportunities to support Indigenous craft producers through the purchase of their products. Craft producers prefer using natural and traditional materials due to warmth, performance and longevity. Additionally, the act of creating their products has cultural significance with perceived positive mental health benefits.
This project brought together IK and Western science to identify the opportunities for traditional clothing ensembles to be both part of operational activities in cold climates as well as a spark for economic development. Critically, it also identified that while this is an opportunity to fiscally support northern communities through the development of a pool of craft producersin order to produce a sufficient stock for purchase by the GoC, it is also an opportunity for cultural, community, ceremonial, and craft resurgence in the North. One of the largest ways that mental health and general health can be improved in the North is through connecting to the land; this project can also fill that gap through investment via community craft producers. The author strongly believes that this investment would and could change the lives of people living in northern communities if it was done correctly and over the longterm.

Publications:

Barker, A., Power, J. and Mahar, M. (2022) Thermal Evaluation of Government of Canada Cold Weather Clothing and Indigenous Garments. NRC Report No.: NRC-OCRE-2021-TR-059

Sullivan-Kwantes, W., Haman, F., Kingma, B. R. M., Martini, S., Gautier-Wong, E., Chen, K. Y., and Friedl, K. (2020) Human performance research for military operations in extreme cold environments. Journal of Science and Medicine in Sport 24(10). DOI: 10.1016/j.jsams.2020.11.010

1 NEMO, the NRC thermal manikin in our St. John's laboratory, with the Parks Canada uniform and some of the Indigenous-made clothing being tested.

2 Image of the qiviut neck warmer that was tested, bought from UAC, Ulukhaktok.

Contaminants in Ringed Seals from the Canadian arctic

Organization Name
Environment and Climate Change Canada (ECCC)

Project Lead(s)
Magali Houde (ECCC, Montreal), Derek Muir (ECCC, Burlington) and Steve Ferguson (Fisheries and Oceans, Winnipeg)

Communities Involved
Sachs Harbour, NWT
Resolute Bay, Nunavut
Arviat, Nunavut
Nain, Nunatsiavut

Completion Status
On-going. This ringed seal core monitoring project is funded by the Northern Contaminants Program (Government of Canada).

Project Objective/Purpose
The major questions that this project addresses are:
1) how are concentrations of legacy and new contaminants changing over time in ringed seals,
2) are trends similar across the Canadian Arctic, and
3) how does climate change influence the accumulation of contaminants in seals?

➔ **Project description continued on page 75**

Project Description

The ringed seal is a species of high cultural, economic, and nutritional importance among Indigenous Peoples. Since the 1990s, this monitoring project has been assessing a series of contaminants in ringed seal tissues. Ringed seals are currently sampled annually by the four core communities involved in this project (Sachs Harbour, Resolute Bay, Arviat, and Nain). Through the coordination of the local Hunters and Trappers groups and the Nunatsiavut government (for Nain), tissues of ringed seals are collected during subsistence hunts using sampling kits provided by researchers. Pieces of blubber, liver, muscle, and the lower jaw are collected, and the seal length, blubber thickness, and sex are recorded. All samples are then shipped to different laboratories to be analyzed.

The blubber and liver of seals are analyzed to determine trends in a large suite of persistent pollutants. Metals, including mercury, are also analyzed in meat and liver. The diet of seals is assessed using stable isotopes (from muscle) and fatty acids (from blubber) as indicators of the diet of the animals.

Results have shown that levels of contaminants vary among locations and age/sex of the seals. Most concentrations of legacy contaminants have been decreasing in seals over time. Newer contaminants (more recently used by industries) have been found in seals, but at lower levels. Every year, updated contaminant results are shared with the communities and the regional health agencies to help community members make informed decisions on their diet. An outreach project has also been created to increase communication, results dissemination, and capacity sharing in communities involved in this on-going study. Most recently, in September 2023, Magali Houde and her team visited Sachs Harbour where they met with the Hunters and Trapper Committee to share results from the project and gain feedback on current and future directions of the project. A contaminants/ringed seal workshop was also held at the school, where science activities and games were played with the students to engage the youth in contaminants research.

Establishing a Freshwater Biodiversity Monitoring Program in the Inuvik-Tuktoyaktuk Corridor

↑ Photo: Joshua Teddy (Tuktoyaktuk based Imaryuk Monitor collecting a kick-net sample for environmental eDNA in the Hans Creek watershed near the Inuvik-Tuktoyaktuk Highway in October 2022. Photo taken by Max Kotokak Sr.

Organization Name
Environment and Climate Change Canada

Project Lead(s)
Dr. Jordan Musetta-Lambert

Communities Involved
Inuvik and Tuktoyaktuk

Completion Status
Ongoing (since 2019)

Project Objective/Purpose
The main goal of this project is to establish a biodiversity monitoring program across the region stretching from Inuvik to Tuktoyaktuk. This corridor in the Inuvialuit Settlement Region is experiencing many environmental changes from new development and increased vehicle traffic (i.e., Inuvik-Tuktoyaktuk Highway), landscape change such as permafrost thaw and shrub expansion, and range expansion and population changes in freshwater ecosystem engineers (i.e., beavers). The cumulative impacts of these climate- and development-driven changes have the potential to impact freshwater ecosystem health and biodiversity, including the potential for stream ecosystems to sustain healthy fish populations.

➔ **Project description on page 80**

Project Description

This project currently involves measuring water quality and ecosystem health through a standardized routine of chemistry, habitat, and biotic indicators in streams between Inuvik and Tuktoyaktuk. The biotic indicators of ecosystem health represent sensitive aquatic insect taxa that are present in streams and support healthy fish populations; however, more recent eDNA samples have also been archived for upcoming use in measuring fish biodiversity.

Some of the ideas for this project originated to address concerns related to the impact of the Inuvik-Tuktoyaktuk Highway on stream ecosystem health through a GNWT Cumulative Impacts Monitoring Program funded project (CIMP210; 2019 to 2022). In realization that biodiversity and ecosystem function data is sparse in the Canadian Arctic, the program has expanded to streams further from the roadway that drain into the Husky Lakes (Imaryuk) and the Mackenzie Delta. Many of the newly sampled stream ecosystems have been impacted by extensive and recent beaver activity. Community outreach has helped develop extended methods that build on the initial objectives associated with biodiversity to characterize the potential for contaminant (i.e., mercury) accumulation in stream food webs due to beaver activity. Collaboration for this part of the project links various other academic (Wilfrid Laurier University, Anglia Ruskin University) and territorial government projects (GNWT CIMP231) and relies heavily on support and collaboration with the Imaryuk Monitoring Program. Working extensively in the field with the two monitors from Tuktoyaktuk, Lennie Emaghok and Joshua Teddy, and two monitors from Inuvik, Max Kotokak Sr. and Borge Avery, has been critical to project success.

Updates on results are shared annually at the Inuvialuit Game Council meetings, and updates on the collaboration with the Imaryuk Monitoring Program have been shared at the Fisheries Joint Management Committee meeting by Kirt Ruben, the Joint Secretariat Community Based Monitoring Program manager. In 2022, under the initial program focused on the Inuvik-Tuktoyaktuk Highway, an ECCC interdepartmental collaboration was able to provide Canadian Aquatic Biomonitoring Network Field Technician certification to many of the Imaryuk Monitors and other community members. In late 2022 and throughout 2023, many samples were collected for this program led by the monitors. These partnerships will hopefully continue to allow this study to succeed and aid in the collection of critical data on water quality and biodiversity to address community concerns and inform ongoing ECCC initiatives.

← Photo: Jonathan Keating (ECCC), Mat Mervryn (Wilfred Laurier University MSc. student) and Max Kotokak Sr. (Inuvik Imaryuk Monitor) sampling a stream in the upper reach of the Hans Creek watershed just downstream of a beaver impoundment. Photo taken in July 2023 by Jordan Musetta-Lambert.

Community Bathymetry Mapping

↑ Brucella lesion: Caribou with a swollen joint.

Organization Name
Natural Resources Canada

Project Lead(s)
Dustin Whalen

Communities Involved
Aklavik, Tuktoyaktuk

Completion Status
Ongoing

Project Objective/Purpose
This project uses a community-based approach to collect seabed bathymetry (the measurement of the depth of water in oceans, seas, or lakes) data. The project has three objectives: (1) the safety of travellers in the ocean and river in a changing climate; (2) provide more information of climate- driven ecosystem changes in the ocean and river; and (3) provide a means for the community members to adapt through this new knowledge.

Project Description
There is a concern from communities like Tuktoyaktuk and Aklavik, located in the shallow Mackenzie-Beaufort region, that the waters of the Mackenzie Estuary within the Tarim Nunagat Marine Protected Area are changing. Areas are becoming shallower and inaccessible to travellers, fish and marine mammals. Habitats appear to be shifting, which will have a large impact on the subsistence lifestyle of these communities. In this region, local boaters rely on traditional knowledge (TK) and word of mouth to determine the best navigation routes. This practice continues into the ocean where older Canadian Hydrographic Charts (upwards of 50 years out of date) have not kept up with the demands of climate- driven changes to the seabed and water levels in this dynamic environment.

The Tuktoyaktuk and Aklavik Bathymetry projects were initiated with Natural Resources Canada to tackle this problem head-on. Through a grant from CIRNAC, DFO/CHS and FJMC the communities developed crowd sourcing community-driven methodology to collect bathymetry information. Using popular off-the-shelf sonars (Lowrance ©), a total of 21 sonars were purchased and installed on 21 boats (14 in Aklavik, 7 in Tuktoyaktuk). Already, the program has produced over 10,000 km of single-beam sonar readings. The value of this data will be highlighted through its integration into usable mosaics for several popular navigation routes for the communities. The data is uploaded for free on the C-Map Genesis webpage (C-MAP Genesis - Social Map (genesismaps.com)) and has already been integrated with the EMSA (Enhanced maritime situational awareness) application.

Geoscience Research to Inform Adaptation Solutions in the Community of Tuktoyaktuk

Organization Name
Natural Resources Canada

Project Lead(s)
Dustin Whalen

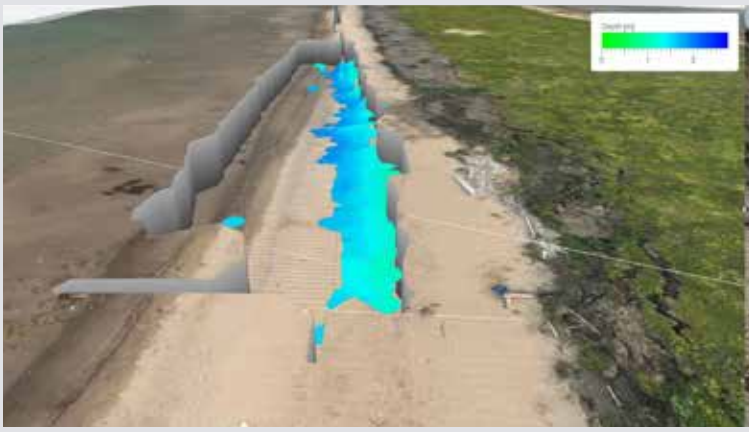
Communities Involved
Tuktoyaktuk

Completion Status
Ongoing

Project Objective/Purpose
To support bottom-up approaches of geoscience collection that will empower the Arctic coastal community of Tuktoyaktuk to achieve more effective and informed decision-making to address the threats posed by climate changes.

Project Description

Tuktoyaktuk is perhaps the most climate-threatened community in Canada. Rising sealevels, increased coastal erosion, and accelerating ground thaw are already threatening this community and posing challenging questions. The community of over 900 inhabitants needs urgent answers to aid future decisions as the Hamlet faces catastrophic challenges at its current location and configuration. Natural Resources Canada is working with the Hamlet of Tuktoyaktuk, Tuktoyaktuk Community Corporation, and Northumbria University to provide effective geoscience to answer these questions. The project is focused on coastal and ground stability, air quality, and water quality. Coastal erosion monitoring took place on a weekly basis during the summer of 2023; this provided a detailed assessment of the coastal resiliency to storms and high-water (flooding) events. In addition, ground-penetrating radar was used to map the ground ice beneath the town. Initial findings show that storm surge flooding and wave over-topping events during high water can impact the ground temperature and increase the thawing potential of ice-rich areas. Water samples were collected throughout the harbour to look at the contaminant levels of mercury, micro-plastics and metals. Initial results show that hotspots were identified in the harbour. Future monitoring in 2024 of these regions is required to determine their longevity and mobility. Lastly, the project looked at air quality (namely dust) that has been caused by the increased traffic on the town's roadways. Work on this will continue in 2024, but it is clear that dust from excess traffic has increased in the community. This work is closely linked with the hamlet of Tuktoyaktuk and not only provides funding for the Community Liaison Research position (Deva-Lynn Pokiak), but also provides regular reports and advice on mitigation strategies for the community. Natural Resources Canada will continue to work with partner agencies to monitor climate change impacts to existing and new infrastructure investments. This includes monitoring the new shore protection being placed along the coast and creating baseline data of the surrounding area to support a future relocation strategy. The project has a webpage (FutureTuktoyaktuk.org) and Facebook site: ***(https://www.facebook.com/p/NUNA-Adaptation-for-Resilient-Coast-Futures-100090781550515/)***.



Beluga Health Research and Monitoring in the Tarium Niryutait Marine Protected Area and Inuvialuit Settlement Region

↑ July 9, 2023. Hendrickson Island. Portion of the Hendrickson Island field crew, as well as visiting Future Leaders. From left to right: K. Cockney, J. Keevik, V. Casaubon, J. Brewster, J. Elias (organizer for 2023 Beluga Harvest Project), É. Couture, A. Elliot, C. Felix, D. Panaktalok, L. Murray, M. Wardekker, H. Nuyaviak. Not pictured: L. Loseto, J. P. Desforges. Photo credit: DFO.

Organization Name
Fisheries and Oceans Canada (DFO)

Project Lead(s)
Lisa Loseto (Research Scientist, Principal Investigator) with support from Shannon MacPhee and Laura Murray (Aquatic Science Biologists)

Communities Involved
All communities in the Inuvialuit Settlement Region

Completion Status
Ongoing

Project Objective/Purpose
The Beluga Health Research and Monitoring program characterizes the baseline health of Eastern Beaufort Sea (EBS) beluga (*Delphinapterus leucas*) by analyzing data and tissue samples from harvested whales. It leverages the long-term FJMC Fish and Marine Mammal Community Monitoring Program ("Beluga Harvest Monitoring Program') and enables the collection of various measures of beluga health (e.g., contaminants, diet, diseases). The program aims to understand the impacts of stressors with a focus on climate change, contaminants, and ecosystem shifts, all by using holistic and integrative approaches, and is the most comprehensive long-term beluga health research and monitoring program for a healthy population in the circumpolar North.

Project Description

The beluga health program characterizes the baseline health of beluga by collecting samples and data from harvested whales, in partnership with the FJMC's Fish and Marine Mammal Community Monitoring Program. The program is ongoing and evolving, with health work beginning in 2001and new research priorities in response to community and science questions (e.g., microplastics).

Beluga Monitors collect samples and data from harvested beluga at camps across the ISR, at present including Shingle Point, East Whitefish, Kendall Island, Hendrickson Island, Paulatuk, and Ulukhaktok. In areas without Monitors or at times when no Monitor is present, hunters are encouraged to collect samples themselves through Harvester Reward kits. There is also more intensive sampling conducted at Hendrickson Island by a DFO Science team.

Together, scientists and community-based monitors collect a suite of biological and health indicators. Contaminants are monitored including mercury, POPs, and PFAS, as are diseases such as *Bartonella* sp., and *Toxoplasma gondii*. Biotracers (stable isotopes, fatty acids, highly-branched isoprenoids) are used to understand beluga diet and to study the food web. Traditional Knowledge indicators identified by Inuvialuit harvesters were added to the core monitoring program in 2018. Other newer additions include microplastics, metabolomics, and genomic health measures (transcriptomics, and RNA sequencing). Also in recent years, there has been a comparison of contaminant and health endpoints with other populations (Western Hudson Bay beluga stock and St. Laurence estuary).

In addition to the health data obtained from this program, there is also a focus on building community capacity, with a community-based Research Monitor based at Hendrickson Island working alongside the DFO Science team there. Also at Hendrickson in 2023, Future Leaders from both the SINEWS (Sistering Indigenous and Western Science) program and the Beluga Harvest Project visited and learned about the program. As well, two veterinarians were present conducting necropsies and weighing whales to support the second Health Assessment of EBS whales.

Information obtained from the beluga health program supports regional management tools such as the TN MPA and AN MPA Monitoring Plans, Beaufort Sea Beluga Management plan, State of the Arctic Ocean reporting, and stock assessment. The program also supports international management such as the Arctic Monitoring and Assessment Program (AMAP) mercury assessment, AMAP microplastic assessment, and the Minamata Convention on Mercury.

← Photo: July 7, 2023. Hendrickson Island. E. Couture and V. Casaubon performing a necropsy on a whale while K. Cockney and B. Gruben observe and learn. Photo Credit: DFO.

↑ Photo: July 6, 2023. Hendrickson Island. Whale being sampled. At whale left to right: H. Nuyaviak, C. Felix, D. Panaktalok. In background: L. Loseto, V. Casaubon, É. Couture, J. Elias. Photo credit: DFO.

↑ Photo: July 9, 2023. Hendrickson Island. Weighing of whale. From left to right: V. Casaubon, J. Brewster, E. Couture, H. Nuyaviak. Photo credit: DFO.

Bibliographies

Inuvialuit Regional Corporation's Internal Research Projects

Project Title	Project Lead(s)
Powered By Youth – Cleaner Energy Virtual Discussion Group	N. Dutta, K. Hvatum & S. Williams
ISR Climate Watch	R. Springer & J. Parrott
Improving Communication on Climate Change & Cleaner Energy Terminology for Inuvialuit and Researchers in the Inuvialuit Settlement Region (ISR).	R. Springer, N. Dutta, S. Williams & J. Parrott
Evaluating Microplastic and Additive Concentrations in the ISR Waterways	S. Williams & K. Hvatum
Investigating Water Quality in Fish-Bearing Lakes Between Inuvik and Tuktoyaktuk	S. Williams
ISR Climate Change Action Map	R. Springer
Special Day with My Anaanak – A Children's Book on Knowledge Transfer Between Elders and Youth	J. Parrott, M. Etter, T. Cockney-Goose & S. Williams
Inuvialuit Stewardship on the Land Program	C. Klengenberg & C. Gruben
Qanuippitaa? National Inuit Health Survey (QNIHS)	M. Etter, P. Tedoff & R. Kusimo
Understanding Patterns of Social Interaction in the Inuvialuit Settlement Region (or Community Connections Survey)	R. Mazan & J. Parrott
Inuvialuit Socio-Cultural Economic Indicators	J. Parrott & B. Simpson
Inuvialuit Settlement Region Platform	J. Parrott
IRC Mobile Research Laboratory	J. Parrott, R. Mazan, & S. Williams
Inuvialuit Place Names (IPN)	R. Mazan
Carbon Pricing Study in the Inuvialuit Settlement Region (ISR)	N. Dutta, S. Williams & J. Parrott

Inuvialuit Regional Corporation's Internal Research Projects

Project Title	Project Lead(s)
A Case Study on Genomic Technology to Support Reindeer Management in the Inuvialuit Settlement Region	K. Hvatum & S. Williams
Energy Coordination for the Inuvialuit Settlement Region (ISR)	N. Dutta, S. Williams & J. Parrott

Inuvialuit Community-led Research Projects

Funded by Northern Contaminants Program

Project Title	Project Lead(s)
Paulatuk Beluga Drone Project	K. Orvitz, K. Scharffenberg, L. Loseto, J. Illisiak Jr. & F. Wolki
Gamification of Climate Change Adaptation: Traditional Inuit Games and Land-Based Skills for Navigating Ice Safety	K. Kuhnert, D. Kuptana, T. Voudrach & M. Rutty
Community-led muskox and caribou health surveillance in the Inuvialuit and Kitikmeot regions	OHTC Board, A. Dumond, B. Maksagak, F. Mavrot, and S. Kutz

Academic Organizations' Research Projects

Funded by Northern Contatminants Program

Project Title	Project Lead(s)
ILLUQ: Permafrost – Pollution – Health Website (upcoming): Illuq.eu	H. Lantuit, M. Langer, A. Rautio, J. Ramage & S. Gartler
Country Foods for Good Health: Promoting foods in the Inuvialuit Settlement Region that Reflect Inuvialuit Culture, Knowledge, and Values (Country Foods for Good Health: Phase Two)	S. Ostertag, B. Laird, & K. Skinner

Academic Organizations' Research Projects

Project Title	Project Lead(s)
Paleoecology of the Mackenzie River uplands region	A. Medeiros & A. Marquardt
The Effects of Disturbance on Green Alder and Dwarf Birch Health and Productivity in the Low Arctic Tundra	J. Baltzer, C. Wallace & C. O'Brien
'Carving out Climate Testimony': Inuit Youth, Wellness & Environmental Stewardship	K. Williamson & J. Bagelman
Bridging Science and Traditional Knowledge in alignment with Marine Conservation Targets	M. Irvine, M. Gauthier & D. Russell-Loewen
Understanding the Extreme Snow Conditions of the Winter of 2023-24 in the Inuvialuit Settlement Region	P. Marsh

Academic Organizations' Research Projects

Project Title	Project Lead(s)
A Recognized Need for Growing Northern Economies and Safer Personal Protective Equipment for Government of Canada Employees	A. Schnell & A. Barker
The NSERC CREATE "LEAP" Program's Northern Field School: Training Tomorrow's Leaders in Permafrost Thaw and Northern Research	D. Froese, A. Alvarez, S. Kokelj, S. Tank & O. Sonnentag

Federal Government's Research Projects

Funded by Northern Contaminants Program

Project Title	Project Lead(s)
Contaminants in Ringed Seals from the Canadian Arctic	M. Houde, D. Muir & S. Ferguson

Federal Government's Research Projects

Project Title	Project Lead(s)
Establishing a Freshwater Biodiversity Monitoring Program in the Inuvik-Tuktoyaktuk Corridor	J. Musetta-Lambert
Community Bathymetry Mapping	D. Whalen
Geoscience Research to Inform Adaptation Solutions in the Community of Tuktoyaktuk	D. Whalen
Beluga Health Research and Monitoring in the Tarium Niryutait Marine Protected Area and Inuvialuit Settlement Region	L. Loseto, S. MacPhee and & L. Murray

Index of Organizational Acronyms

AMAP	Arctic Monitoring and Assessment Program
CCS	Community Connection Survey
CIMP	Cumulative Impacts Monitoring Program
COLO	Cost-of-Living Offset
CREATE	Collaborative Research and Training Experience Program
DFO	Department of Fisheries and Oceans Canada
EBS	Eastern Beaufort Sea
ECCC	Environment and Climate Change Canada
FJMC	Fisheries Joint Management Council
GNWT	Government of the Northwest Territories
GoC	Government of Canada
HTC	Hunters and Trappers Committee
IK	Indigenous Knowledge
IPN	Inuvialuit Place Names
IQP	Inuit Qaujisarnirmut Pilirijjutit
IRC	Inuvialuit Regional Corporation
ISCC	Innovation, Inuvialuit Science and Climate Change
ISR	Inuvialuit Settlement Region
ITH	Inuvik-Tuktoyaktuk Highway
KCl	Potassium Chloride
NRCan	Natural Resources of Canada
NSERC	Natural Sciences and Engineering Research Council of Canada
NT	Northwest Territories
NWT	Northwest Territories
PbY	Powered by Youth
PHTC	Paulatuk Hunters and Trappers Committee
POLAR	Portal to Online Licensing Applications for Research
PPE	Personal Protective Equipment
QNIHS	Qanuippitaa? National Inuit Health Survey
RYAG	Regional Youth Advisory Group
SINEWS	Sistering Indigenous and Western Science
STEM	Science, Technology, Engineering and Math

WORD SEARCH

P	A	N	I	R	Y	U	A	R	U	T	A	A	N	I
D	D	U	I	A	I	R	S	I	B	Q	I	D	I	Q
A	E	I	Y	R	Q	R	I	T	T	E	Y	S	R	F
M	I	H	I	N	G	N	A	R	Y	U	A	N	G	-
I	T	T	A	A	N	G	A	N	I	W	E	W	Q	I
N	I	I	E	F	A	O	Q	R	Q	R	F	T	E	R
I	K	U	A	L	L	A	K	Y	U	A	Q	T	U	Q
T	Q	Q	V	D	O	U	D	N	R	U	E	K	H	K
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R	Q	M	S	F	R	R	Y	J	A	E	S	P	L	G
L	H	H	A	D	G	G	U	D	N	O	O	R	A	F
I	Q	S	G	Q	A	U	K	L	H	A	U	U	U	I
I	U	D	U	P	Q	I	N	A	M	U	Q	I	Q	K
T	Q	Q	U	Q	T	O	E	T	H	H	Q	E	E	A

Climate Terms – Inuinnaqtun

✔	Words	Definition
	Qiqumaniq	When you reach the frozen part
	Paniryuarutaani	Very dry period/time
	Kininnaqtut	Things that make you wet
	Hila	Weather
	Imaq	Water
	Hilaryukyuaq	Really bad weather
	Uumaviat	Every living thing
	Halumailrutit	Something that dirties some-thing - things that makes other things dirty

Q	I	Q	U	M	A	N	I	Q	H	W	U	U	E
S	G	S	ł	F	ł	E	S	Q	J	O	E	H	T
P	A	L	A	N	G	A	H	I	P	A	Y	A	-
A	Q	T	A	Q	M	M	A	Y	T	K	I	H	Q
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W	S	Q	J	O	E	H	F	T	A	K	E	H	I
M	M	A	F	E	S	Q	K	A	U	W	H	q̂	R
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S	E	F	W	L	U	A	F	S	E	R	I	F	T
U	U	E	A	N	N	D	H	O	O	F	A	Y	I
S	Q	U	Q	N	M	M	A	U	K	F	F	q̂	T
S	K	Q	A	E	S	S	O	E	S	E	X	q̂	X
I	L	P	T	Q	E	W	D	W	W	Q	A	M	I

Climate Terms – Uummarmiutun

✔	Words	Definition
	Qiqumaniq	Water
	Paniryuarutaani	Weather
	Kininnaqtut	Damp weather
	Hila	Every living thing
	Imaq	Very dry
	Hilaryukyuaq	Things that make other things dirty -something that makes it dirty - all is dirty
	Uumaviat	Frozen part
	Halumailrutit	Really big, bad weather

WORD SEARCH

P	E	E	I	N	G	N	I	R	Y	U	A	Q	E	N	F
Q	A	O	O	R	D	D	T	F	V	T	O	R	R	I	F
I	D	L	V	K	A	Y	Y	F	U	E	U	Y	G	R	Ł
Q	T	T	A	I	T	V	R	Ł	F	A	A	K	F	Y	H
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M	F	A	A	I	N	K	R	H	X	A	H	K	Ł	T	U
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F	H	E	X	I	H	L	D	K	Q	A	X	E	U	Y	G
F	X	T	O	A	H	A	K	A	X	R	G	T	O	T	X
Ł	S	K	O	L	U	D	N	D	T	V	D	L	E	D	E
H	I	K	L	U	O	A	H	E	U	Y	G	X	U	H	O
H	L	O	A	I	P	D	D	R	X	O	D	R	H	G	D
U	A	E	O	T	O	E	T	R	I	M	A	Q	E	H	U

Climate Terms – Sallirmiutun

✔	Words	Definition
	Pannaqłuk	Very dry
	Silaqłukpavialuk	Big, bad weather (XXLweather, extreme weather)
	Sila	Weather
	Qiqumaniq	Frozen part - when you reachthe frozen part
	Imaq	Water
	Salumainniq	Bad things/stuff - dirtystuff
	Uumaviat	Where everything lives
	Miniqłuk	Damp weather

H	W	A	J	X	A	V	S	O	A	R	O	H	E	A
G	I	X	K	V	O	I	U	V	Y	K	X	I	I	K
G	L	S	S	W	X	G	J	R	U	S	J	A	J	D
A	D	W	T	H	G	U	O	R	D	W	U	P	L	P
A	F	V	I	O	R	I	W	K	Y	R	J	A	A	E
K	I	E	Y	V	R	X	A	O	S	T	M	F	O	R
S	R	R	H	E	S	I	R	F	R	I	V	H	A	M
S	E	I	T	S	I	X	C	W	N	R	K	O	F	A
K	A	V	F	J	H	O	R	A	I	S	I	U	O	F
A	J	O	H	J	T	Y	F	T	L	S	H	G	P	R
S	W	E	A	T	H	E	R	E	S	S	W	U	A	O
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O	Y	X	G	P	Y	E	E	X	F	T	R	T	A	T
N	O	I	T	A	G	I	T	I	M	V	H	H	E	U
F	T	P	J	F	T	I	F	V	P	J	E	T	I	S

Climate Terms – English

✔	Words	Definition
	Precipitation	Rain, snow, sleet, or hail that falls to the ground.
	Pollution	The presence in or introduction into the environment of a substance or thing that has harmful or poisonous effects
	Permafrost	A thick subsurface layer of soil that remains frozen throughout the year
	Water	A colourless, transparent, odourless liquid that forms the seas, lakes, rivers, and rain and is the basis of the fluids of living organisms
	Drought	A prolonged period of abnormally low rainfall, leading to a shortage of water
	Weather	The short-term conditions of the lower atmosphere,such as precipitation, temperature, humidity, wind direction, wind speed, and atmospheric pressure.
	Extreme Weather	Unexpected, unusual, severe or unseasonal weather
	Environment	The natural world, as a whole or in a particular geographical area, especially as affected by human activity

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