

# Community Voices on Climate Change and Health Adaptation in Northern Canada

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AUGUST 2019

Research and Action and  
the Stories Behind Them  
2012–2016

**Summary Report of Indigenous Services  
Canada's Climate Change and Health Adaptation  
Program for Northern First Nations and  
Inuit Communities**



Indigenous Services  
Canada

Services aux  
Autochtones Canada

Canada



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**Summary Report of Indigenous Services Canada's Climate Change and Health Adaptation  
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Prepared by  
Deanna Matthews  
(Climate Change and Health Adaptation Program)  
First Nations and Inuit Health Branch, Department of Indigenous Services





YUKON RIVER  
INTER-TRIBAL  
WATERSHED

INUVALUIT

GWICH'IN

TR'ONDËK  
HWËCH'INAKLAVIK

INUVIK

PAULATUK

ULUKHAKTOK

CHAMPAGNE-  
AISHIHIK

NA-CHO NYAK DUN

KUGLUKTUK

CAMBRIDGE BAY

KLUANE

SELKIRK

DÉLİNE

LITTLE SALMON  
CARMACKS

DEHCHO  
TULIT'A

BVEHCHOKÒ

DETTAHN'DILO

DENENDEH

RIVIÈRE JEAN-MARIE

LUTSEL K'E DENE

NISGA'A

LIARD

K'ÁTL'ODEECHE

KAKISA

KA'A'GEE  
TU

SMITH'S  
LANDING

ARVIAT



# Climate Telling Community Projects

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# Key Terms

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**Climate Change and Health Adaptation Program (CCHAP):** Indigenous Services Canada's Climate Change and Health Adaptation Program was developed to build capacity in First Nations and Inuit communities, enabling the development of research skills, adaptation plans, and communication materials in response to a changing environment and its impact on human health.

**Indigenous Knowledge (IK), Traditional Knowledge (TK), Traditional Ecological Knowledge (TEK):** "The on-going accumulation of knowledge, practices and beliefs about relationships between living beings in a specific ecosystem that is acquired by Indigenous people over hundreds or thousands of years through direct contact with the environment, handed down through generations, and used for life-sustaining ways. This knowledge includes the relationships between people, plants, animals, natural phenomena, landscapes, and timing of events for activities such as hunting, fishing, trapping, agriculture, and forestry. It encompasses the world view of a people, which includes ecology, spirituality, human and animal relationships, and more" (US Department of the Interior National Parks Service, 2017).

**Inuit Qaujimajatuqangit (IQ):** "Inuit beliefs, laws, principles and values along with traditional knowledge, skills and attitudes" (Nunavut Department of Education, 2007).

# Climate Change and Indigenous Health

“The health effects [of climate change] are multiple, wide-ranging and inter-related. Direct effects (floods, heat, drought, storms), indirect effects (water quality, air pollution, land use changes, ecological change), social effects (infrastructure, mobility, socioeconomic status, health status) and all of these also affect health (injuries, diseases, poisoning, allergies, nutrition, stress and mental health effects)”. – CCHAP Workshop, 2016

In 2009, the *Lancet* named climate change as the biggest global health threat of the 21<sup>st</sup> century. Climate change is felt across boundaries, changing patterns of disease, disturbing water and food security, exposing vulnerabilities in human settlements situated on thawing permafrost regions, and is further compounded by population growth and migration (Costello, et al., 2009). Within recent years, extreme climatic events have occurred across Canada, with rampant fires in British Columbia and Alberta, flooding across the prairies, Ontario, and Quebec, and severe ice storms throughout Atlantic Canada.

“Arctic temperatures are rising faster than the global average. The Arctic has been warming more than twice as rapidly as the world as a whole for the past 50 years. January 2016 in the Arctic was 5°C warmer than the 1981–2010 average for the region, a full 2°C higher than the previous record set in 2008” (Arctic Monitoring Assessment Programme, 2017).

Unfortunately, the communities who contribute to climate change the least, particularly in the North, are acutely vulnerable to the negative impacts of climate change (Althor, Watson, & Fuller, 2016). First Nations and Inuit make up the largest portion of the total population in the Northwest Territories, Nunavut, Yukon, Nunatsiavut and Nunavik. Changes in the climate directly affect Indigenous health, threatening food security from fluctuating animal distributions and ecosystem changes, prolonging shipping traffic in Arctic waters that disrupts subsistence activities, increasing injury and death due to unstable ice and snow—from unpredictable and extreme weather events and warming temperatures, and decreasing the availability of safe drinking water due to environmental pollutants being released as glacier ice melts.

Indigenous communities around the world have a strong relationship with the land, forming the basis for culture, spirituality, social cohesion, health, and overall well-being. As such, climate change poses a significant threat to these traditional livelihoods (Ford, et al., 2008). Over the last few decades, First Nations and Inuit accounts have documented observed changes in the landscape, aligning with scientific findings that climate change is now “unequivocal” (Intergovernmental Panel on Climate Change, 2007).



# Executive Summary

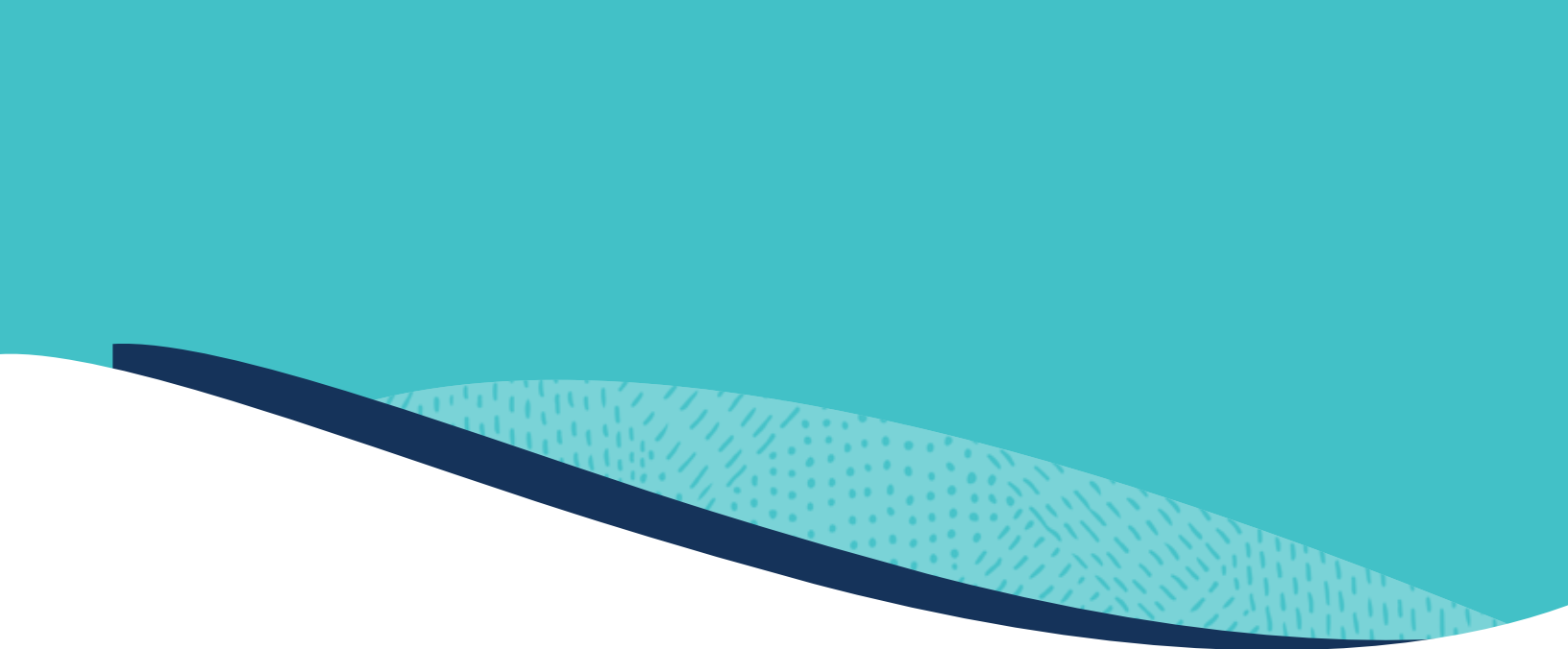
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The Climate Change and Health Adaptation Program (CCHAP), is a service provided by the First Nations and Inuit Health Branch of Indigenous Services Canada. Launched in 2008 by Health Canada, the CCHAP was developed to build capacity in First Nations and Inuit communities, enabling the development of research skills, adaptation plans, and communication materials in response to a changing environment and its impact on human health. The CCHAP has supported 95 projects from 2008 to 2016, supporting northern First Nations and Inuit communities as research leaders.

In 2016 CCHAP was split into two regional programs: a northern program which continues to focus on northern health adaptation from a regional perspective (CCHAP North); and a new southern program which is designed to mirror previous work that was conducted in the north and establish health adaptation efforts in First Nations communities South of the 60<sup>th</sup> parallel (CCHAP for First Nations South of 60°N). In 2017, with the establishment of Indigenous Services Canada, the First Nations and Inuit Health Branch and CCHAP were transferred to this newly created Department.

From initial planning to implementation, communities have undertaken research projects that meet the needs and priorities of their communities in a meaningful and locally appropriate manner. Projects have inherently taken a multidisciplinary approach to adaptation work, incorporating both science and Indigenous Knowledge. The integration of two knowledge streams has strengthened community capacity to respond more immediately to emerging priorities.

The following report summarizes the 57 community-driven research projects that were funded by the CCHAP from 2012–2016 while it was part of Health Canada. Each summary has been shared by the communities themselves or designated project representatives, as they are the gatekeepers of this data. As such, the content within the report has been developed by the communities and is told from their perspective.



Also included in this report are “Community Voices”, which offer additional anecdotes to support individual project profiles. Through the lens of climate change and health adaptation, the projects focus on a variety of topics, namely food security and access to traditional country food, the protection and integration of traditional medicines, Elder and youth engagement, land safety and cultural education programming, mental health, and access to safe drinking water. Furthermore, the projects represent a significant Canadian contribution to support the global effort by Indigenous communities to adapt to climate change.

Through their efforts, communities have increased their knowledge and understandings of the health effects related to climate change and have developed local adaptation strategies. This summary report has been created so that communities, tribal councils, governments and individual community members can discover how others have developed actions to improve their resiliency to climate change. It has been organized by a series of themes so readers can discover issues that are pertinent to their needs,

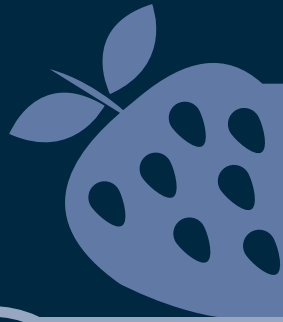
requirements and interests. A number of communities may have received funding over subsequent years as they have built upon what they learned from the previous year. The author of this report has done her best to group these pieces of community-based research together.

In reading this report, connections can be made and knowledge can be shared among individuals and organizations. By making these connections, health outcomes can be improved through the adoption of climate change adaptation measures. Our hope is to amplify Indigenous voices on climate change, and the importance of community-led research in finding solutions.

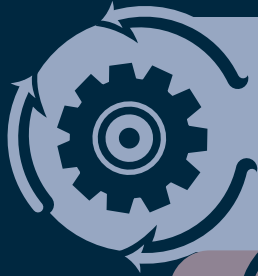
# Research and Action and the Stories Behind Them

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Food Security



Adaptation Planning



Education



Traditional Medicine



Water Quality



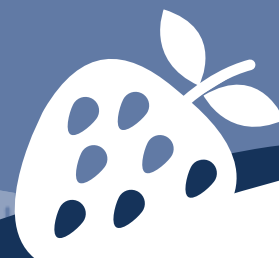
Access to Land



Mental Health

# Food Security

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“Climate change is a significant driver of change for food security, because it threatens food production and its stability as well as other aspects of food systems such as storage, food access and utilization” (Wheeler & Von Braun, 2013).

Food is fundamentally important for sustaining human life, and for northern First Nations and Inuit communities, food security is often tied to the relationship with the land. The harvesting of traditional country food has sustained Indigenous communities for millennia, and is essential for a healthy physical, mental, and spiritual lifestyle. Land-based activities are often the centre of community, where skills and TK are passed from generation to generation. However, cultural practices, hunting, gathering, food preparation, and language have been heavily shaped by food availability and accessibility. Among other factors, climate change has impacted the availability and accessibility of country food in the north through changes in animal migratory patterns (Power, 2008), access to hunting areas and the distribution range of traditional food sources, contamination of drinking water supplies, changes in traditional food preservation techniques, and potential increases in food contaminants (Arctic Monitoring Assessment Programme, 2017).

In a changing climate, ensuring that northern First Nations and Inuit have access to country foods, foods that are nutrient dense—such as wild meat, plants, berries, and marine species—is of the utmost importance for overall well-being (Rosol, et al., 2011). Securing access to culturally relevant and preferred, safe and nutritious foods is considered a global issue and is being taken seriously by governments, non-government organizations and communities around the world.

“To be food secure, individuals and households must be able to reliably access food via income levels that are sufficient to offset the high cost of food, and must have access to a sufficient supply of nutritious market and traditional food at the community level” (Rosol, et al., 2011).

The importance of food security for northern First Nations and Inuit has been reflected in community-led research proposals submitted to CCHAP. Since 2012, 20 out of 57 community funded projects from across the Canadian Arctic focused on food security related issues. You will find below the 18 success stories that provide a sense of the realities of food security in the Canadian Arctic.

## Community Profile

Location: Carmacks, Yukon

Population: 505

Land Area: 36.95 km<sup>2</sup>



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# Little Salmon Carmacks, Yukon

(2012-13)

### PARTNERS

Cambio Consulting

### PROJECT INFORMATION

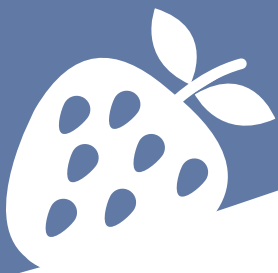
Food Security and Our Future Leaders: Young Adults Build Capacity Through Northern Community Gardens

## Community History

Little Salmon Carmacks First Nation is a self-governing community located in Carmacks, 177 km north of Whitehorse, Yukon. The community has a strong dependence on country foods, as it is part of their traditional way of life; community members partake in the harvesting of fish, wildlife, plants and berries. However, warming trends in the ocean impact the Yukon River salmon runs, an important part of the community's diet. Small lakes that were once thriving are now bone dry. The cost of buying meat and fish is too high for

most people, especially the vulnerable, the young, the sick and the Elders. Buying fresh produce is usually not an option for the vulnerable either. In wintertime, ice conditions on the river are changing too. People are losing trust in their ability to navigate along the traditional routes, experiencing open water, deep overflow and rotten ice.





## Project Summary

The objective was to provide young people with a sense of accomplishment by participating in a meaningful agricultural-based program and the expansion of the community garden. The project increased the knowledge of young First Nation adults in nutrition, health, food security, and climate change by engaging them, while also teaching the fundamentals of leadership. This project was important to the community because of the dependence on imported foods (which are often nutritionally poor foods) and the loss of traditional methods that support a healthy lifestyle.

## Research Activities and Capacity Building

Four young people were involved in the planning and development of the community garden expansion. The youth were taught all aspects of the operation, and also delivered vegetables to people in the community in need such as single mothers, pregnant women and people with diabetes. The project leads believed that young people needed to understand their responsibility to be healthy; youth had to be involved in learning how to plant a garden, how to compost, how to grow their own vegetables, such as carrots, beets, beans, cabbage, broccoli, cauliflower, peas, turnip, corn, peppers, lettuce, squash, zucchini, honeydew, celery, zucchini, tomatoes, cucumbers, and potatoes, and how to store food, as the demand for fresh produce exceeded the community's current capacity. At the community harvest gathering, discussions focused on understanding food

security, climate change, and the importance of increased self-sufficiency and decreased dependence on fossil fuel imports. Six young adults were surveyed and interviewed to establish their growing knowledge of health, diet, nutrition and lifestyle over the course of the project, and they also participated in three workshops.

## Traditional/Local Knowledge

Survival is a key cultural skill, and this research project aimed to increase young people's capacity to sustain a food security crisis. Sharing, Caring, Teaching and Respect are also fundamental cornerstones of traditional knowledge, and this program incorporated these values while creating opportunities for community members to lead healthier lifestyles. The project team had a vision for everyone to build their own gardens. The traditional way of storing food in a cache was also becoming more popular. The traditional methods of drying fish and meat were not being lost as younger generations were still being taught the old ways; however, some families had not passed on their skills to the young people. As part of the communications plan, Elders were invited to share their stories with the young adults. The Elders spoke about their youth, what they ate, and what the climate was like back in their day.



## What Was Learned

The three workshops provided facilitators and youth workers with an opportunity to deal with key questions about community, food security, and the relationship of leadership and food in their community. Participants also looked at the environmental footprint of various foods, made comparisons, and created a web-mapping diagram illustrating where their food is produced. Four different leadership activities focusing on team relationships also urged the youth to consider what qualities and skills they have as leaders, and how they could work together to overcome challenges.

## Next Steps

The garden project ultimately allowed the First Nation to develop food security alternatives as a mechanism to combat changes in the land and increased risks related to climate change. In addition, Little Salmon Carmacks First Nation has been committed to supporting the garden as a social benefit with wide-ranging benefits. With an open door policy, all people are encouraged to tour the garden and greenhouse. There are also teachings for anyone who wants to learn how to grow things, ask questions, talk about vegetables, and learn about the benefits of gardening. The LSCFN garden project has also hosted a number of events to increase awareness of this successful First Nation initiative. Other communities have been invited to tour the garden and to participate in hands-on training. Because of the gardens' success, the garden coordinator was invited to a number of other communities in the Yukon to share her experiences and knowledge on how to run a community garden. The LSCFN garden project has been, and will continue to be, a role model.



## Community Profile

Location: Mayo, Yukon

Population: 601

Land Area: Traditional Territory covering 162,456 km<sup>2</sup> with 131,456km<sup>2</sup> in the Yukon and 30,857km<sup>2</sup> in NWT.

### CONTACT INFORMATION

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# Na-Cho Nyak Dun, Yukon

(2012-13)

### PARTNERS

First Nation of Na-Cho Nyak Dun, Heritage and Culture Department,  
Rose Lemieux – NND Elder Councillor, Jen Jones – Consultant, Tera Melancon  
– NND Health Promotion Coordinator, Bob Van Dijken

### PROJECT INFORMATION

Mayo Talks Climate Change and Health

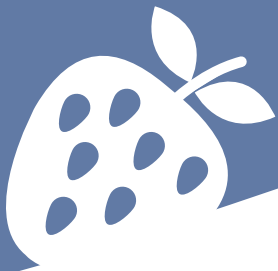
## Community History

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The First Nation of Na-Cho Nyak Dun represents the most northerly community of the Northern Tutchone language and culture group. In the Northern Tutchone language, the Stewart River is called Na Cho Nyak, meaning “Big River”. In early times, the ancestors of the First Nation of Na-Cho Nyak Dun lived off the land and their lifestyle required travelling throughout the First Nation’s traditional territory at various times of the year for hunting, fishing, and gathering food to survive.

The climate changes are seen in many ways by the community, but of particular concern is access to food. Mayo is a small community with one highway that provides the main access in and out of the community. There is a small airstrip that is used primarily for medical emergencies and an increased amount of industrial activity. The current store offers a limited amount of groceries and produce is not only very expensive, but also of poor quality.





In addition, the community is rapidly losing the language associated with observing the land, specifically around plants, plant harvesting and medicine preparation. This knowledge is very important to document and pass on. To be able to effectively communicate the impacts of climate change on the health of the community, the residents needed to be able to communicate these messages in Northern Tutchone.

## Project Summary

The goal of the project was to create messages in Northern Tutchone, to provide people with knowledge (scientific and traditional) about incorporating traditional foods into their diets, while also adapting their lifestyles to improve health in the context of a changing climate. This project was important to the community of Mayo not only because it is about healthier lifestyles, but because it incorporates the Northern Tutchone culture and language into the creation of these messages.

The project resulted in a series of knowledge-generating activities in the community, including a Hot Springs Women's retreat, jam making and a climate change and food security session, basket-making workshops, film screening with Elders, discussion sessions on small space gardening, recycling workshops and presentations with local experts.

## Traditional/Local Knowledge

The first part of the project involved the collection of traditional knowledge, which was then used to help formulate messages for adapting harvesting practices to the effects of climate change and reducing impacts on health. In Mayo, the knowledge of hunters, berry pickers and other harvesters gained from years of observation on the land and from knowledge passed on to them, formed the basis of community monitoring programs (Community Ecological Monitoring Project, Elsa Remediation). This baseline information helped to detect changes in the environment

over time, whether from natural or human causes. Local people as stewards of the land play an important role in monitoring changes on the land, and with wildlife and plants.

The Elders told many stories about picking plants, berries and medicines when they were young, and about the places they would go and how they would use them. People who harvested from the land knew a lot about the areas they used and have other knowledge that had been passed down from Elders; this knowledge continues to develop each year as more time is spent on the land, learning from others.

## Resources Developed and Communications

The primary deliverable of this project was a series of materials including posters, postcards, messages, and newsletters that were distributed through the Heritage Department, and the NND website ([www.nndfn.com](http://www.nndfn.com)). The community also utilized an adaptation strategy to increase food security by circulating seedling packages to the community. A community cookbook was also created with favorite recipes that used local and traditional foods, and the project created a lot of discussion around food, recipes and adaptations. Furthermore, the messages that were created in the project strengthened local knowledge systems and decision making, and could also be translated into other Indigenous languages. Lastly, the community proposed a draft Mayo Regional Community Climate Change Adaptation Plan that was developed in partnership with the Northern Climate ExChange, Yukon College and the Yukon government.

## Community Profile

Location: Northern British Columbia and Yukon

Population : Tr'ondëk Hwëch'in = 1,100,  
Nisga'a = 6,000

Land Area: Tr'ondëk Hwëch'in = 2,598 km<sup>2</sup>,  
Nisga'a = 2,000 km<sup>2</sup>



### CONTACT INFORMATION

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# Nisga'a, British Columbia and Tr'ondëk Hwëch'in, Yukon

(2012-13)

### PARTNERS

Tr'ondëk Hwëch'in and Wilp Wilxo'oskwhl Nisga'a; Dr. Nancy Turner, University of Victoria; Bill Kendrick, Jody Beaumont, Tr'ondëk Hwëch'in Heritage and Culture; Nisga'a Lisims Government; Nisga'a Valley Health; Dr. Jane Ruddick; Nisga'a Elders Emma Nyce, Alice Azak; Dr. Joseph Gosnell; Tr'ondëk Hwëch'in Elders; Gitwinksihlkw Village

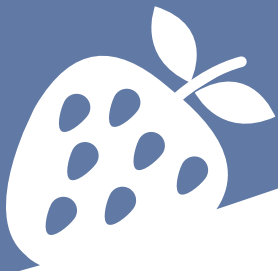
### PROJECT INFORMATION

Berried Treasure: Nisga'a and Tr'ondëk Hwëch'in Berry Harvests in the Northwest Canadian Permafrost

## Community History

On the northernmost coastline of British Columbia, the Nisga'a people have survived for countless generations by sustainably harvesting the plants, wildlife, and fish from their Nass River Valley homelands. Further north, in Canada's Yukon Territory, the Hän-speaking Tr'ondëk Hwëch'in people from the Dawson/Klondike River region also lived with the landscape as their perpetual "grocery

store". For both Indigenous peoples, berries growing on permafrost plateaus have long been an important source of nutrition, as well as a way to add colour and variety to their diet. Traditions of harvesting, tending, and nutritious use of berries are becoming important again, since it is sometimes difficult to gain access to store-bought foods. However, the food plants from the permafrost regions of the alpine



were of concern. Some years the climate is not conducive to developing berries, as discovered in autumn 2011 when an attempt was made to harvest blueberries that had been extremely abundant in 2010, but were almost non-existent in 2011. More information was needed to understand how climate change was influencing these valuable and healthy plant foods. In response to the knowledge-holders' concerns, the research team looked at the health benefits of permafrost berries, and at harvesting strategies to ensure that the fields of berries stay healthy too.

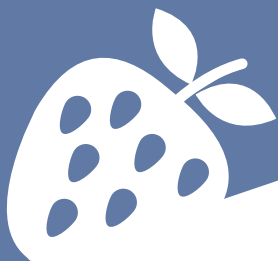
## Project Summary

The communities had a number of questions for exploration: How were berries traditionally harvested in permafrost regions of Tr'ondëk Hwëch'in and Nisga'a homelands, including during the cold winter months when peoples' health was particularly vulnerable? What nutrients in these berries kept people healthy? What is the potential influence of climate change on the availability and nutritional quality of berries that provided year-round nutrition? The project involved two different communities in different parts of the north because there was an interest in sharing knowledge about permafrost plant foods and building upon the knowledge in both places. The comparison of harvesting methods also provided a way to share adaptive strategies, showing how oral history guided Elders' choices about the plants to harvest and where or when a harvest should take place depending on weather, ice, and snow.

## Research Activities

Tr'ondëk Hwëch'in and Nisga'a knowledge-holders were interviewed about the timing and harvesting practices of berries growing on permafrost plateaus, and their long-term recollections of climate change. To complement traditional knowledge, the Northern Climate Exchange at Yukon College provided information about climate change in both study regions. Later on in the summer, fall, and winter, berry samples were collected on the permafrost plateaus. Nutritional testing at a laboratory in Vancouver, BC followed within 24 hours of collecting the samples, and the analysis confirmed Indigenous peoples' medicinal/nutritional knowledge: the darker berries proved rich in anthocyanins and the lighter coloured berries had very high vitamin C content. Berries harvested from under the snow had antioxidant content equal to those freshly harvested. Nisga'a and Tr'ondëk Hwëch'in school and college students also participated in berry harvesting and testing and in learning directly from Elders. In June of 2012, the Wilp Wilxo'oskwhl Nisga'a Institute hosted an ethnobotany course where Bachelor and Masters' students participated in the research, and in July, a children's ethnobotany camp focused on nutritious berries of the region.

The research has international applications, since berries growing in Northwest Canadian permafrost landscapes are also enjoyed by other Indigenous peoples of the circumpolar north. The research shows that native berries of the permafrost offer crucial nutrients for people, animals, and the soil-food web. The traditions associated with berry management and harvesting may be keys to retaining food security and community health in the face of exponential climate change.



## Capacity Building

The project included educational opportunities for Nisga'a and Tr'ondëk Hwëch'in students of all ages, and Elders were directly involved in the educational and research aspects. In this project, the transfer of knowledge across generations and among scientists, Elders, and youth was key to better understanding the health impacts of climate change. The project leads also engaged Nisga'a Valley Health, so that the tools and knowledge could be communicated to health practitioners.

## Traditional/Local Knowledge

Nisga'a knowledge-holders organized and recalled generations of observation and conservation through use of a harvest wheel. The harvest wheel correlates the timing of fish and wildlife harvests with the harvests of berries and other plant foods. The harvest wheel is a long-term and detailed observation tool that is an example of traditional phenological knowledge: Indigenous peoples' understanding of life cycles of organisms, and the use of indicators to highlight when and how much to harvest in a given year and climatic cycle.

## Resources Developed and Communications

Harvesting, Elder interviews, an ethnobotany course, a children's summer camp, and community presentations/workshops provided an opportunity for Elders and young people to share knowledge about staying healthy throughout the year as climates, landscapes, and cultures change. DVDs and written work from this research help with language revitalization and to keep Elders' valued wisdom alive and in active use. Results and conclusions from the project were also shared with Indigenous peoples elsewhere through hard copy distribution, websites, and conferences.

## What Was Learned and Next Steps

Nutritional analysis at a laboratory confirmed Indigenous peoples' medicinal/ nutritional knowledge: the darker berries proved rich in anthocyanins and the lighter coloured berries had very high vitamin C content. Berries harvested from under the snow had antioxidant content equal to those freshly harvested. For the health of communities and the ecosystems that sustain them, it is vital to investigate how western science might combine with traditional knowledge to clarify health-giving properties of plant foods accessed year-round, and the importance of dietary diversity (that is, eating a variety of foods daily or weekly). By bringing together and sharing the knowledge of Indigenous peoples and from Western science, the "berried treasures" of the Circumpolar North can be maintained.



## Community Profile

Location: The Dehcho Territory is located in the southwestern part of the Northwest Territories bordering British Columbia, Alberta and the Yukon.

Population: 5,000

### CONTACT INFORMATION

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Website: [www.dehcho.org](http://www.dehcho.org);  
[www.dehchofirstnations.com](http://www.dehchofirstnations.com)

# Dehcho, Northwest Territories

(2012-13)  
(2013-14)

### PARTNERS

(Member community organizations) Deh Gah Got'ie Dene Council, Tthe'ehdeli First Nation, Kaa'a'ge Tu First Nation, Liidlii Kue First Nation, Naha Dehe Dene Band, Pehdzeh Ki First Nation, Sambaa K'e Dene Band, West Point First Nation, Fort Simpson Métis Local 52, and Fort Providence Métis Local 57.

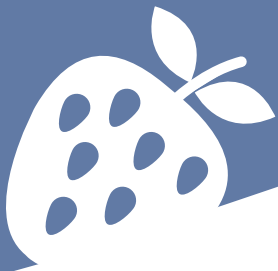
### PROJECT INFORMATION

A Return to Country Food; Examining Risks and Benefits and Contaminant Perceptions on the Safety of the Traditional Diet.

## Community History

Historically, the Dene have lived in the Canadian North since time immemorial. Over the centuries, the Dene evolved into distinct tribal groups, each with their own language and customs. Traditionally, the Dene were people of the boreal forest and great northern rivers; they were accomplished

hunters who travelled by snowshoe in winter, and birch bark or spruce bark canoes in summer. The communities of the Dehcho Territory lie within a latitude zone in the boreal forest of Canada, and have been impacted by climate change as temperatures have been increasing disproportionately to elsewhere in southern Canada. The Elders and harvesters of the Dehcho speak about the many changes that are affecting travel and hunting-gathering on the land.



## Project Summary

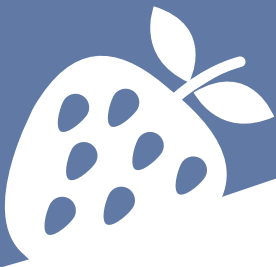
“Return to Country Food” workshops were hosted in Ttheke’ehdeli (Jean Marie River) and Kaa’a’ge Tu (Kakisa). The workshops gave government and university researchers an opportunity to learn more about the climate change concerns of the Dene and Metis based on their traditional knowledge, and in turn, the researchers brought scientific knowledge and information to the forum. As a community member put it: “Climate change is with us, and it affects our lives; it is observed every day by our traditional knowledge holders who spend time on the land, and is measured by scientists here and in other regions of the Northwest Territories. We will need to adapt as ecosystems change, and our traditional knowledge and skills on the land may become the very essence of our survival”.

## Research Activities

A dietary survey was conducted to measure the importance of country food in the areas most impacted by increasing mercury levels. The surveys were conducted in the six most affected communities by community members hired through contracts. The 415 completed surveys indicated that although many Dene and Métis have moved away from the hunting/trapping lifestyle to a wage-based economy, they still treasured a diet that included traditional food such as moose and fish.

## Capacity Building

- Ttheke’ehdeli (JMR) First Nation, the University of Waterloo and the Dehcho Aquatic Resource Management conducted a fish-down project on Sanguez Lake. The objective was to build a younger, faster growing stock of walleye and northern pike that had acceptable levels of mercury for harvest and would be healthy to eat.
- Resulting from the final “Return to Country Food” workshop, University of Waterloo researchers conducted a human bioaccumulation study to measure mercury levels in Dene and Métis of the Dehcho territory. The study was to determine if contaminants were really a problem in the region.
- A Dehcho First Nations’ K’ehodi (On-The-Land) program was developed by Dahti Tsetso to enable the Dene and Métis to spend more time on the land through traditional knowledge and skill-building activities. The program aimed to strengthen and rebuild the Dene way of living on the land, ensuring that members would be able to adapt to climate change.



## Community Voices

The project team interviewed several community members about climate change during the “Return to Country Food” workshops, these were their accounts:

- Chief Stanley Sanguetz: “There is a concern in the community as to how climate change is affecting everything; the food chain; the country food that we love so much. This is why our community is persistent to continue studies on climate change. We still live off fish, rabbit, porcupine here but it is changing quickly.”
- Dr. Kami Kandola, Deputy Chief Public Health Officer: “Traditional food is typically lower in salts, sugars and unhealthy fats, making it a healthier food source”. Dr. Kandola emphasized the benefit of traditional foods to healthy nutritional habits, the low risk of contaminants and the importance of fish in Dene and Métis diet.
- Grand Chief Herb Norwegian: “We need to be out there, we need to harvest and we need to bring children out there, to tell them stories; when the children are on the Horn Plateau they wonder, ‘Why aren’t Dene living up here? It is such a beautiful place.’ In our traditional way, we are doing our own research, assessing whether the fish are fat and healthy. We do this in conjunction with contaminant researchers who can tell us if there is anything wrong in the system.” Grand Chief Herb Norwegian stated that traditional food is sacred, allowing the Dene to survive to modern times. He expressed concern that major changes are coming and that we must be prepared for a very rough ride.

## What Was Learned

In response to the 415 surveys:

- 75% of participants felt that they required further information on the levels of mercury in fish and 71% wanted more information on the benefits of consuming fish and wild meat.
- 41% of respondents wanted themselves or one of their family members to be tested for mercury exposure.
- 97% of study participants provided information on how they would like to receive information on the benefits of eating fish.
  - 62% of respondents would want to receive information from the surveyor.
  - 74% of respondents would want to receive information from handouts and posters.
  - 81% of respondents would want to receive information from community workshops/feast.
  - Approximately 3% of respondents did not want information through any of the three above options.

## Community Profile

Location: Behchokò, Northwest Territories

Population: 2,064

### CONTACT INFORMATION

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# Behchokò, Northwest Territories

(2012–13) (2013–14)

### PARTNERS

Dr. Alice Legat, Trent University

### PROJECT INFORMATION

Phase 1: Keeping Our Community Healthy

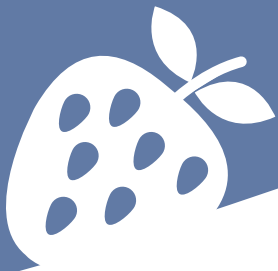
Phase 2: Changing Climate, Changing Food: Adaptation and Health

## Community History

In Behchokò, NWT, most people participate in the traditional economies of hunting, fishing, and trapping. The implications of climate change in the traditional land base include a decrease in caribou population and an increase in fires and seasonal warming. Oral narratives document changes in snow and ice patterns as well, with the ice freezing later in the season and melting earlier. The

community was concerned about caribou migratory patterns since changing ice conditions impact the ability of caribou to cross the ice where they have traditionally done before.

Climate change has also affected the health of all members of the community, and Elders have had a harder time adapting to severe diet changes—they want caribou and fish. Since 43% of the population is unemployed, the lack of caribou and other traditional foods has resulted in an



increased reliance on highly processed, cheap store-bought food; food that has well-documented correlations to diabetes, obesity and other health-related concerns. As traditional resources are lost due to climate change, children in the community also have an increased risk of chronic health problems from an early age.

## Project Summary

During Phase I, the project team examined the impacts of the loss of caribou due to climate change on health and harvesting restrictions. Both phases of the project addressed three major questions: i) what traditional foods should the community harvest to ensure good physical, spiritual, and emotional health? ii) How does a non-traditional food diet affect physical, spiritual, and emotional health? iii) And, what adaptive strategies would Elders and harvesters recommend to deal with the issue of caribou, climate change, and health? Built on Phase 1 of the project, Phase 2 went into more depth by looking at some adaptive strategies that Elders and harvesters recommend using to address the interconnected issues of climate change, caribou and health.

## Research Activities

Both Elders and harvesters were interviewed on the benefits of traditional food. They were interviewed in their homes, in a focus group, and at traditional camps where youth were taught to harvest land-based resources associated with traditional foods and diet, prior to preparing and consuming food such as muskrat, rabbit, fish, and caribou. It was found that there was more success in gathering information when Elders and harvesters worked closely with the youth.

## Capacity Building

The project provided the community with new resources (see “Resources Developed”) for understanding the health impacts of climate change. Elders provided knowledge on how to choose appropriate traditional foods when caribou were not in the vicinity; traditional food that feeds the physical, spiritual and emotional body. Health professionals discussed the physical implications of choosing traditional food—or food similar to traditional foods—rather than processed foods. Lastly, youth were involved in developing a video script, and interviewed members of the community for the video about the health implications related to eating traditional foods and processed foods.

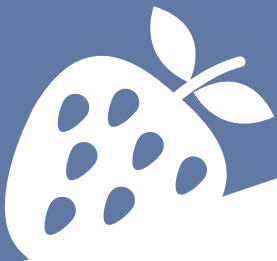
## Traditional/Local Knowledge

The project was a traditional knowledge project. By engaging Elders to discuss the effects of climate change on caribou, and the resulting health effects, traditional knowledge was not only a component of the research, but was the driving force of the research.

## Resources Developed

A video on traditional foods and a brochure outlining the health benefits of traditional foods were designed and approved. An academic paper was also put forward by members of the research team, and was proposed to be part of a book on traditional food and health in sub-arctic communities. In addition, a literature review was completed.





## What Was Learned

Researchers found that the main concerns related to the health of the land. Elders and harvesters experienced depression and anxiety in association with a lack of access to places and their ability to travel. The Elders' Advisory Committee changed the focus from traditional diet to assess to "the land", and told stories about depression among the Elders, the disconnect between Elders and young people, and the anxiety among the harvesters. In January 2014 the harvesters and Elders became more intent on considering adaptive strategies and solutions as the next stage. The Elders' Advisory Committee decided that the third year of the program should consider solutions to the anxiety associated with climate change, especially to the access to traditional foods and activities. A proposal outlining their solutions and a research component to analyze the potential success of the suggested solutions was submitted to CCHAP.



## Community Profile

Location: Western shore of Hudson Bay, Nunavut

Population: 3,000

Land Area: 132.07 km<sup>2</sup>



### CONTACT INFORMATION

Arviat Health Committee, Arviat Hamlet Council

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## Arviat, Nunavut

(2012-13) (2013-14)  
(2014-15) (2015-16)

### PARTNERS

Phase I: Michael Cohen, Hilda Panigoniak, Sarah Curley, Arviat Youth Pilirigatiingniq, Arviat District Education Authority, Arviat Wellness Centre, Arviat Economic Development Committee, Arviat Hunters' and Trappers' Organization, Arviat Tourism Initiative, Qaujigiartiit Health Research Network

Additional Partners Phases II-IV: Kim Arualak; Arctic Food Networks: Mason White, Lola Sheppard, Morgan Ip, Matthew Spremulli; University of Windsor: Dr. Nihar Biswas, Dr. Paul Henshaw, Dr. Rajesh Seth, Dr. Xiaohong (Iris) Xu, Dr. Rupp Carriveau, Dr. Edwin Tam, Dr. Sherah VanLaerhoven; Arviat Cultural Eco-Tourism Initiative: Olivia Tagalik; Agriculture Canada: Valerie Whealan, Dr. Xiuming Ho; Arviat Elder Advocacy Group; ARCTICConnexion/ ARCTICConnexion Université du Québec à Rimouski: Vincent L'Hérault; Jamie Bell, Nunavut Arctic College; Mike Johnson; Jessica Reiniger, Mount Allison University; Judy Connor, John Amalukjuak High School

### PROJECT INFORMATION

Phase I: Climate Change Health Adaptation Strategies for Inuit Food Security

Phase II: Food Security and Sustainability: Planning for Climate Change Impacts

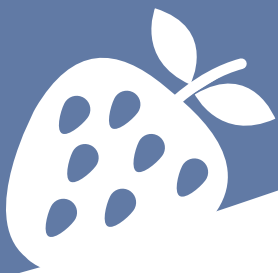
Phase III: Positive Impacts of Climate Change that Support Community Food Production

Phase IV: Engaging Climate Change

## Community History

Arviat is an Inuit community located on the west coast of Hudson Bay in Nunavut. Like most Nunavut communities, Arviat was established as a result of forced relocation in the late 1950s-early 1960s. Over the past 40–50 years, the people

have undergone severe social and cultural dislocation, as the societal strengths and cultural beliefs that had sustained them for thousands of years were systemically replaced.

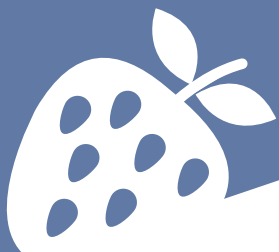


The majority of the people are Padlirmiut Inuit, and the language and culture is well preserved. Arviat is generally described as one of the most traditional Inuit communities. However, as a result of a more western lifestyle, there now are fewer knowledgeable harvesters and more “amateur” hunters, leading to greater risks and more of the animal is wasted. Greater reliance on store-bought food results in a higher carb/high sugar diet. In the last five years, there has been a 110% increase in type 2 diabetes.

Recent Inuit Health Survey results (which included Arviat) state that Nunavut in particular, has “by far the highest documented food insecurity prevalence rate (68.8%) for any Indigenous population residing in a developed country”. Country foods make an important contribution to Inuit health and food security in Arviat and climate change is having an impact on Arviat food security because it is affecting country food harvesting. Arviat observations indicate that there may be fewer numbers of caribou, char, and ring and harbour seals in the area—all country food staples for local Inuit. These species are harder to reach due to changes in sea ice, permafrost, water levels and sedimentation and changes in migration routes. Travelling further for harvesting through more difficult terrain is often required, costing more in resources and requires more knowledgeable harvesters. To ensure food security, knowledge and skills concerning adaptation strategies must be developed and strategies tested to learn sustainable solutions for access to country foods in combination with other healthy fresh foods.

## Project Summary and Research Activities

Phase I of this project focused on research to create an Inuit definition of “sharing” that can be applied to country food, and what principles of “sharing” need to be applied to food distribution (i.e. exploring Inuit concepts of “reciprocity” and “self-reliance”). Phase I determined which community assets could be used to develop country food supports in the face of climate change. Research was conducted with Arviat Elders to ensure that the developing community food security plan is grounded in Inuit values, and is considered culturally appropriate in today’s context. This project was built on previous research and community planning processes to address identified priorities in the availability and accessibility of country food. Information was documented to share Elder perspectives on a culturally appropriate definition of “food sharing”, using principles of reciprocity and self-reliance. Moreover, there were 32 interview participants in “Kitchen Table Talks with Harvesting Families”. The Kitchen Table Talks were consistent across a variety of themes: caribou uses, community harvesting practices and sharing, and support for *Inuit Qaujimajatuqangit* (IQ) principles. A community survey was also conducted with a total of 256 respondents. There were 100 respondents who self-identified as hunters and an additional 156 respondents who self-identified as country food consumers. The survey had two main components aimed at gathering data on the use of the community freezer and also accessibility to country food and harvesting. Furthermore, an adaptation tool—a community freezer—was acquired to ensure food security in a changing climate. Finally, a three-day workshop was held in the community to present data, respond to concerns raised in the process and to validate the recommendations that arose from the study.



Introducing greenhouse and compost systems as a community initiative in Arviat, this summer project (Phase II) employed six summer students and recent graduates with two university-level supervisors to explore potential adaptations for improved food security and waste management. Core to this multifaceted approach was the learning potential it provided for the engagement of local students, whose prolonged involvement would be essential for the continuation of the instigated endeavors. The initiative was divided into five components: vegetable production, organic waste disposal or composting, food storage, local plant usage and local food habits. Within these areas, a variety of building, sampling, interviewing and basic research principles were utilized.

Phase III explored how the community could take advantage of the positive impacts of climate change in order to improve overall health, with a focus on food security. They were also interested in ways to improve soil quality in order to support plant growth. A pilot project was run to investigate the feasibility of local food production with greenhouse farming. There was a focus on the development of local capacity with youth for building, operating and monitoring a greenhouse food production project with the help of mentors. The project developed local production of yoghurt to ensure access to dairy products that are accessible to community members. Furthermore, youth were involved in the development of a “cooking culture” to leverage interest in using both vegetables and country foods in daily diets. Through the creation of five “cooking show” videos and many recipes, youth gained food production skills and promoted their efforts within the community and beyond. In order to have 12 documented cooking events, a “cooking from scratch” video contest was held with local high school students. As a result of the contest, the team received an additional seven cooking videos that were uploaded onto the website.

In Phase IV, the project focused on the engagement of Arviat in becoming aware of the immediate impacts of climate change in order to build capacity to build community knowledge and promote solid planning. This project aimed to build capacity through the development of skills amongst the large youth population so they are well-equipped to

successfully address climate change through innovative and adaptive planning. Water quality monitoring was also a feature of this project. In collaboration with the Young Hunters Program, five summer monitors were trained, as well as several Young Hunters who participated in water features testing, E. Coli and coliform testing, fish necropsy, and the collection of invertebrates. Inuit rely heavily on *polimmaksarniq* (ensuring that everyone develops the skills and knowledge that will help them to be successful regardless of changing circumstances). Monitoring programs were established for water, fish health, plant growth and permafrost, in addition to exploring the possibility of self-sufficient crop production in the greenhouse.

## Communications

As a result of the project, the Young Hunters Program was recently part of an international award of \$3 million over three years (2015–2018): *Pathways to Mental Wellness for Indigenous Boys and Men: Community-led and land-based programs in the Canadian North*. All project phases developed numerous resources, with over 10 summary reports published, several short films on YouTube, and a series of articles with information about the program can be found online. Furthermore, scholarly articles have been published in the International Journal of Behavioral Nutrition and Physical Activity, Polar Record, and a book chapter in *Determinants of Indigenous Peoples' Health in Canada*.



## Community Profile

Location: Paulatuk, Northwest Territories

Population: 313

Land Area: 66.86 km<sup>2</sup>



### CONTACT INFORMATION

Paulatuk Hunters and Trappers Committee (HTC)

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# Paulatuk, Inuvialuit Settlement Region

(2012-13)

### PARTNERS

Lisa Loseto, Freshwater Institute, Fisheries and Oceans Canada;  
James Malone and Kayla Hansen-Craik, Fisheries Joint Management  
Committee (FJMC); Shannon O'Hara, Inuvialuit Regional Corporation (IRC);  
and Lawrence Ruben, Marine Protected Areas member

### PROJECT INFORMATION

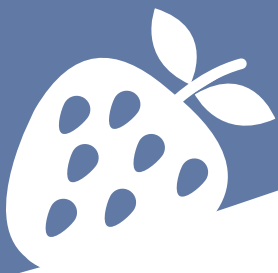
Paulatuk Beluga Whales: Health and Knowledge

## 32 Community History

"Paulatuk is a small village located in the Inuvialuit Settlement Region of the Northwest Territories, adjacent to Darnley Bay, in the Amundsen Gulf. Paulatuq is the Siglitun spelling of the town meaning "place of coal". Paulatuk was an adaptation of the original spelling when coal was found in the 1920s. The two principal languages spoken in Paulatuk are Inuvialuktun and English.

The community of Paulatuk hunts beluga whales in the summer, although the hunts are limited by sea ice conditions that have been changing over the years. Hunters had concerns and questions about the health and well-being of the beluga whales and their supporting ecosystems, since open water earlier in the summer has changed the occurrence of beluga and the hunts. While the whales are from the same population as those harvested at Hendrickson Island, previous research from 2005 showed differences in mercury concentrations, diet markers and other biological measurements.





## Project Summary

The project looked at the dynamic of community and traditional knowledge exchange between Elders and youth regarding climate change, health and harvesting country foods in and around Paulatuk. A two-day outing was held with 10 youth and 7 Elders at Green's (egg) Island, which is about 15 km west of Paulatuk, an area where the majority of the Belugas are harvested. The outing began in late July when the boats were available to transport all youth and Elders out, with PFD's loaned by Parks Canada, and the PHTC provided a Trapper Radio for emergencies. Participants shared information about Beluga whales, whale health and traditional knowledge, with specific reference to how mercury can be passed through whales to humans. In addition, ways to promote healthy activities, how climate change has affected migration and harvesting, and ways to adapt to increasing numbers of Beluga in the area was also discussed.

## Research Activities and Resources Developed

The project included six stages: a community consultation; a climate change workshop featuring a feast; basic surveying and interviewing; a traditional knowledge outing with data collection through discussions and activities; data compilation and analysis; and lastly, project evaluation through use of a climate change survey and evaluation form.

## Capacity Building

This project provided the community with the ability to better understand and manage the health impacts of climate change. Ten youth gained valuable knowledge on traditional hunting, fishing and harvesting practices taught by two Elders. In addition, they also learned about the changes to the land, water, vegetation and native and foreign organisms

that are in the area. Elders were also able to learn from the youth perspectives. The information obtained from this project will be useful to other communities in the ISR, specifically for knowledge exchange with the community of Tuktoyaktuk, which has ongoing Beluga studies at Hendrickson Island.

## What Was Learned

**Harvesting:** Elders mentioned that the number of whales seem to fluctuate from year to year with the changing ice conditions; they felt that it was important for the youth to learn the traditional ways of harvesting whales, fish and other mammals to keep that tradition going.

**Climate change:** Elders spoke of how climate change affects everything in the area, including ice conditions, land formations, weather patterns, whale migration routes, different species of animals and birds in the area. The problem is not isolated to this area; it is a global problem now. A couple of the Elders never heard the term "climate change", but knew what the term meant because of land formations, erosion and the different species of animals and birds in the area.

**Elder/Youth interconnection:** there was a feeling of connectedness between the youth and Elders during the workshop and interviews. The youth mentioned that the Elders were very professional in their traditional practices, and felt that they learned a lot during the workshop, interviews and outing.

## Next Steps

In 2010, the Hamlet of Paulatuk in cooperation with ArcticNorth Consulting Company had worked on a Community Adaptation Strategy (CAS). The next step for the community was to make use of the CAS results by lobbying governments and industry to start to implement some of the recommendation made in the report.

## Community Profile

Location: Watson Lake, Yukon

Population: 1,600

Land Area: Traditional Territory stretching over 240,000 km<sup>2</sup>

### CONTACT INFORMATION

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Website: [www.kaskadenacouncil.com](http://www.kaskadenacouncil.com)

# Liard, Yukon

(2013-14)

### PARTNERS

N/A

### PROJECT INFORMATION

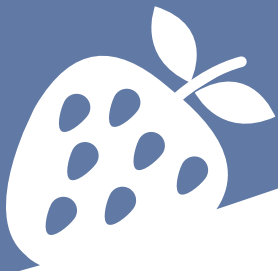
Traditional Food Security and Climate Change: Liard First Nation Traditional Knowledge for Monitoring and Managing the Moose Harvest

## Community History

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Liard First Nation is located in the southeast corner of the Yukon Territory and is part of the Kaska Nation. Extending from BC to the Yukon Territory, the Kaska assert one hundred percent overlap of their traditional territories. Moose within the Kaska territory face many threats to their habitat from climate change, which in turn affects the ability of community members to exercise their Indigenous rights and continue to participate in the traditional economy. Moreover, hydrological changes including water level and changes in precipitation, more intense forest fires and

species migrating north may disturb the moose, but may also result in changes that could be beneficial to moose populations as well. Community-level observations are critical to understanding the challenges facing this important species. By recording observations of environmental changes, the community's ability to prepare for and adapt to these changes will increase through the transfer of knowledge from the community to other stakeholder groups such as industry proponents and the government.



## Project Summary

Community members were invited to participate in a two-day workshop in order to collect and share traditional knowledge regarding moose and climate change. The workshop was well attended with 48 participants over the two days. Ideas for how the community can move into the future while continuing to hunt and eat moose were discussed and future research priorities were identified. If the moose harvest is vulnerable to a changing northern climate, then the health of LFN citizens is as well. Consequently, security of this important traditional food staple is improved if LFN members and wildlife managers can detect and adapt to changes in moose life, habitat use, movement patterns or any other aspect that is influenced by a changing climate.

## Traditional/Local Knowledge

LFN members collectively hold considerable traditional knowledge of wildlife use on the land; a body of knowledge that extends into history far longer than scientific monitoring methods. The knowledge includes traditional hunting routes, key habitat areas, behavioral aspects and linkages of life history timing (e.g. rutting, calving) to other landscape-level processes.

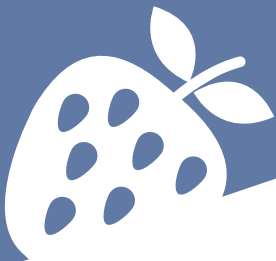
Moose have traditionally been the ideal food, with caribou and other food sources hunted as alternatives. Kaska hunters are raised and trained to use every part of the moose. There are many Elders who still produce “Indian thread” from the animal sinew and tan hides at home in the traditional way. The importance of moose to the Kaska goes beyond the need for subsistence. It is a deeply engrained cultural tradition that permeates many different aspects of Kaska cultural identity. The importance of the Kaska tradition of sharing is extremely important to the survival of the community during times of economic stress for individuals and the community at large. Kaska hunters share their harvest with Elders and extended family members, which allows for the entire community to benefit, even though not every community member hunts.

## Resources Developed and Communications

Through the development of this project, a survey was designed for future studies to allow for a better statistical analysis of moose harvest data and community awareness about climate change. There was also an app platform proposed for development that would allow youth to conduct the surveys through tablets or smart phones, and allow for video and audio recordings of Elders to be digitized. The survey and app idea was proposed to be utilized in the development of future traditional knowledge studies.

## What Was Learned

The workshop produced the disturbing observation that many families would be lucky to get a moose. A very large concern was that there are many non-local hunters coming in and taking moose. Many of the participants were not satisfied with wildlife management practices and would like to be included in the management practices within the traditional territory. There were participants who had recently observed moose carcasses found with only the heads cut off, and the meat left for waste. The evidence of trophy hunting was very difficult for Kaska hunters to understand because of the deeply held beliefs about the value of moose for the meat and hide, as well as the intrinsic value of the moose as a being worthy of respect.



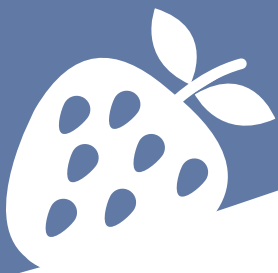
## Next Steps

It was clear from the interviews with participants that there are many observed changes in the environment that could be attributed to climate change. There were many concerns within the community about overhunting, historic contamination and continued pressures from developments such as mining and natural gas development. There was also a myriad of concerns about water, which led to it becoming a priority for a future community workshop. Despite all the changes that have and continue to occur on Kaska territory, the community remains committed to the traditional values of sharing to support the entire community. A strong connection to the land supported the belief that healing for the community would occur in the wilderness where people could reconnect with their land based roots. There are still Elders who grew up on the land and are eager to pass on their knowledge to the youth and all community members who would be interested in learning.









influence narwhal movements and habitat use, and shipping traffic was increasing due to reductions in sea ice. Resource development companies continue to take advantage of longer shipping seasons, and in the future there may even be year-round shipping with continued reductions to sea ice cover.

## Project Summary

The research project was a two-pronged approach to addressing food security impacts in Pond Inlet. The first monitored the influence of changing environmental conditions (e.g., sea ice declines) and industrial activities (shipping) on the behaviour and distribution of narwhal, an important resource for Pond Inlet. Passive Acoustic Monitoring (PAM)<sup>1</sup> and behavioural observation techniques were combined to monitor the numbers and genders of narwhal in the area and their response to shipping activity. The goal of this project was to reduce harm to wildlife and to the community. The project team also developed a community-based protocol for monitoring the impacts of climate change and industrial development on the availability and quality of country food items. Food quality (nutritional value, taste and palatability, diseases, parasites, contaminants, etc.) was monitored using a mixture of sensory (organoleptic), physical, chemical and biochemical evaluation methods, using a sampling protocol developed based on consultation with community members and expert researchers in a variety of fields (nutrition, food science, Indigenous health, wildlife health and biology, contaminants, etc.).

## Research Activities

In order to address community concerns and to be consistent with the QIA mandate “Protecting and Promoting Inuit Rights and Values”, QIA pursued non-invasive methods. The non-invasive components of this project included narwhal and shipping observation, PAM, Food Quality/Food Safety, and the development of a list of marine mammal experts. The list of marine mammal experts, “the Research Network”, was in the process of being established.

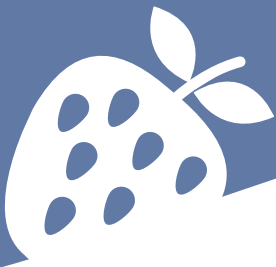
## Capacity Building

Nine Inuit youth and the Pond Inlet community were heavily involved in the development, implementation, and completion of the multifaceted project. The project also included *Inuit Qaujimajatuqangit* (IQ) and Traditional Knowledge (TK) aspects, which were combined with scientific based research. For the project, the nine youth/summer students were trained in research methods and data gathering, knowledge transfer, and community empowerment to react to climate change in an effective manner.

## Traditional/Local Knowledge

TK and IQ were relied upon for the collection of data locations, weather conditions, long-term variation in sea ice conditions, and the observation methods. A goal of the research was to preserve TK regarding the hunting and use of the narwhal. The Food Quality Monitoring program was developed based on IQ, including local knowledge of spatiotemporal variation in food quality (e.g., identification of rivers where Arctic char taste better than in other rivers, historic changes to food quality) and knowledge of the factors that influence the taste and nutritional value of country food (e.g., effects of prey items and habitat use on taste characteristics).

<sup>1</sup> **Passive Acoustic Monitoring (PAM):** Uses autonomous recorders deployed on the seafloor as an effective method for long-term monitoring of marine mammals and noise (Mellinger, Stafford, Moore, Dziak, & Matsumoto, 2007). Autonomous acoustic recorders have been used to monitor the distribution, occurrence, and acoustic behaviors in relation to noise for a variety of marine mammal species and geographic locations (Norris & Yack, 2015).



## Communications

Inuit youth deployed radio advertisements to Mittimatalingmiut and led a series of meetings in Pond Inlet. The youth also deployed Food Safety/Food Quality surveys at community meetings as a method of attaining feedback. As a result, Mittimatalingmiut who attended meetings, read and/or completed surveys were offered opportunities to further voice their opinions at a later date in person, by phone, by email, or in writing. The participants at the community consultations and meetings that were performed by the Inuit youth included, but were not limited to, an Elder, the Acting Pond Inlet CLO, a QIA Executive Committee Member, members of the Hunters and Trappers Organization (HTO), members of the Community Lands and Resources Committee (CLARC), members of the Mary River Project Committee (MRPC), and a representative from the QIA Department of Major Projects.

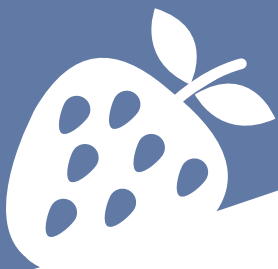
## What Was Learned

- A sample of some Narwhal and Shipping Observation statistics included:
- Narwhal observation occurred between August sixth to twenty-sixth (6th to 26th), 2013;
- There were seventeen (17) days of Narwhal and Shipping Observation;
- Three (3) days of Narwhal and Shipping Observation were not possible due to weather;

- There were 97.8 hours of Narwhal Behavioral Observation;
- Six hundred and twenty-eight (628) narwhal were recorded during the project;
- During the project, narwhal sightings ranged from zero (0) sighted to one hundred and sixty-eight (168) sighted;
- Of the 84.6% of narwhal that could be identified by age class (adult, juveniles, and calves), 69.3% were adult, 24.1% were juveniles, and 6.6% were calves;
- Identified adult narwhal were tallied at three hundred and sixty-eight (368);
- Identified juvenile narwhal were tallied at one hundred and twenty-eight (128);
- Identified narwhal calves were tallied at thirty-five (35);
- The majority (69.7%) of the narwhal that were observed were sexed, with 52.7% were male and 47.3% were female; and

There were twenty-six (26) vessel occurrences during the Narwhal and Shipping Observation portion of the project, as follows:

- Seven (7) ships were large ships (100 metres or larger), six (6) being mining related and (1) being a cruise ship;



- Two (2) ships were medium ships (between 50 to 100 metres), one (1) being a navy ship and one (1) being a yacht;
- Seventeen (17) were small ships (less than 50 metres), sixteen (16) vessels were motor boats and one (1) was a sail boat; and
- At some points kayaks were present during the Narwhal and Shipping Observation period; however, this was rare.

## Next Steps

The fourth component of the project involved the further development of the network of marine mammal experts. The developed network, once created, would act as a source of “on call” experts that QIA and/or its beneficiaries could call on to provide advice in relation to potential marine mammal issues or concerns.



## Community Profile

Location: Burwash Landing, Yukon

Population: 100

Land Area: 30.09 km<sup>2</sup>



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# Kluane, Yukon

(2013-14)

### PARTNERS

Arctic Institute for Community-Based Research, Norma Kassi, Mallory Coletta  
– AICBR, Brenda Carson, Jared Dulac, and Alanna Dickson.

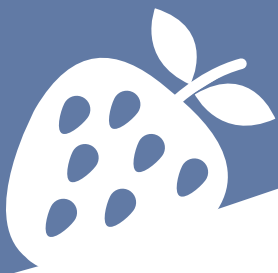
### PROJECT INFORMATION

Nourishing Our Future: An adaptive food security strategy to ensure the cultural and physical well-being of the Kluane First Nation against the impacts of climate change in the Yukon

## Community History

Kluane First Nation (KFN) or “Lù’àn Mǎn Ku Dǎn,” meaning “People of the Lake” in Southern Tutchone, is a self-governing First Nation located in the Southwestern Region of the Yukon Territory. KFN is based in the community of Burwash Landing, which is a remote, off-grid community of approximately 100 people. The nearest grocery store is located in Whitehorse, which is approximately 300 km away. The geographic remoteness

of the community increases their need to live locally and become health conscious, and the impact of climate change on traditional diets has the potential to deeply impact culture. Therefore, the community sought to develop a food security initiative and reconnect with their environment.



## Project Summary

In the long term, the community aimed to develop a food security strategy with a focus on sustainability; this included the need for adaptation, awareness, and education to evolve as changes to the environment and declining food sources take place. The project documented locally-based experiences of climate change and lifestyle changes on nutrition and food security. The project team:

- Compiled a literature review of existing studies and academic research surrounding KFN; this included personal accounts of food and nutrition from local residents.
- Improved intergenerational cultural linkages by connecting Elders and youth through the gathering of stories about nutrition, lifestyle and culture across generations.
- Used a Participatory Action Research (PAR)<sup>2</sup> approach that focused on examining adaptive responses, and the potential for developing a community greenhouse and community garden.

## Research Activities

The participants were co-designers of the research through the PAR approach. Multi-generational and mixed gender participation was encouraged to gain perspective and lost food generating practices. Special emphasis was placed on the inclusion of extended family in nutritional choices. In total, 31 interviews and one focus group were held in the community, in addition to interviews for a film.

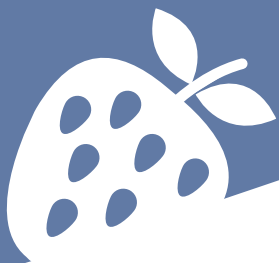
## Capacity Building

- Presentations were given to the community on food security and climate change at the global, national, and local levels. A previous food security project video was also shown.
- Research training was conducted with two youth in the community, and youth learning outcomes were documented throughout the project. Three youth also received training in filmmaking (filming, production, and editing), which led to a final DVD of the project.
- Two avid growers in the community and the two youth research assistants attended a territory-wide community gardening workshop in Whitehorse, co-hosted by the Arctic Institute for Community-Based Research and the Government of Yukon Agriculture Branch.

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<sup>2</sup> **Participatory Action Research (PAR):** is a research approach for community which promotes community participation and action. PAR is a collective and self-reflective inquiry process for researchers and participants directly linked to action, influenced by understanding of history, culture, and local context and embedded in social relationships (Baum, MacDougall, & Smith, 2006).





## Traditional/Local Knowledge

The community has a deep connection to the land and water in the traditional territory; it is the source of traditional foods and is central to cultural and spiritual traditions. Climate change not only impacts the regional environment, but it threatens survival. Therefore, Elders emphasized the importance of protecting their homelands, the waters, and the resources within them.

## Resources Developed and Communications

Ongoing communications occurred between the researchers, the community, and the Chief and Council throughout the research process. The communications activities and developed resources included: a community newsletter article; a handout for an open house hosted by the Dän Këyi Renewable Resource Council; a 3:53-minute film on the project was created by Jared Dulac, a youth research assistant; a project poster presented at the KFN Spring Gathering; and another DVD of the project was nearing completion.

## What Was Learned

Twelve themes, as well as actions recommended to support each of the themes, emerged from the project: climate change and protecting the homelands, sharing practices and methods, community hunts and fishing, ancient methods of conservation, outfitting concessions within the KFN Territory, youth empowerment and mentorship, healthy eating, a community greenhouse, a community garden, agricultural projects, a community store and storage facility, and community celebrations and get-togethers.

## Community Profile

Location: Kakisa, Northwest Territories

Population: 45

Land Area: 94.80 km<sup>2</sup> with Traditional territory spanning 10,000 km<sup>2</sup>

### CONTACT INFORMATION

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# Ka'a'gee Tu, Northwest Territories

(2014-15)

### PARTNERS

Centre for Sustainable Food Systems, Wilfrid Laurier University; Ecology North

### PROJECT INFORMATION

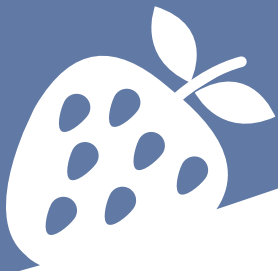
Ka'a'gee Tu First Nation Exploration of Climate Change, Food Security and Health

## Community History

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Ka'a'gee Tu First Nation (KTFN) is based in the community of Kakisa, which is located in the Dehcho Region of the Northwest Territories along the Mackenzie Highway between Hay River and Fort Simpson. KTFN's traditional territory of relatively intact boreal forest is utilized by community members and other surrounding First Nations for a wide variety of harvesting purposes. Most residents rely on country foods as a crucial component to their families' diets and an integral part of their economy. Even though Kakisa has year-round road access, adequate alternatives

to country foods are not always immediately available or are not easily accessible. There is no store in the community, the closest store is 100 kilometres away, and food options there are limited and expensive. Over the past few decades, residents have observed changes to the climate. As a result, those who continued to rely on the land for sustenance were encountering challenges and risks that jeopardized their ability to sustain harvesting practices into the future. For instance, land-users more frequently encountered challenges to winter travel because of late season water



overflows that made travel on ice increasingly dangerous. Furthermore, land-users were unable to reach traditional harvesting areas at times and encountered interruptions to their hunting season.

## Project Summary

Through a comprehensive literature review, 21 semi-structured interviews (Traditional Knowledge sources), and a narrative presentation of existing data, a report brought together existing documentation to create a base for further exploration. The project served to explain how Ka'a'gee Tu First Nation members could take actions to mitigate any identified threats and ensure that country foods remained plentiful and accessible in the short term, and for the next generation.

## Research Activities and Resources Developed

- A research ethics submission and literature review: topics included northern climate change, health and food security; air-photo and meteorological data for the Kakisa region were analyzed.
- A community barbeque and kick-off meeting: the project was introduced to the community, followed by an open discussion about the climate change issues that were a concern for KTFN members.
- Twenty-one Elder and land-user interviews: a semi-structured interview tool was developed in collaboration with Ecology North and WLU; 21 interviews were conducted and was a big success for the project.
- Elder and land-user interviews analysis: interviews were transcribed and analyzed to identify themes. Existing adaptation strategies were discussed, as well as potential future strategies to employ in order to mitigate

the identified impacts of climate change. Based on the analysis, a brief plain language report and presentation were prepared for the community.

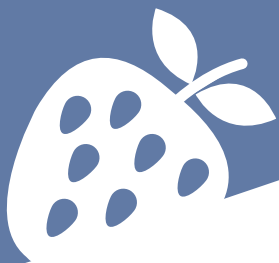
- Results workshop: a public community meeting was held to discuss project results, and served as a valuable basis for further discussion about future planning in the community. Approximately 12 people attended the results meeting, including five Elders.
- The results and discussions informed the development of a final report, a community toolkit for other communities facing similar climate change issues, and a poster that was also translated into South Slavey.

## Capacity Building

Capacity building was a central objective of this project. KTFN hired a local First Nation member to work as the Community Environmental Coordinator Trainee. The role of the trainee was to be actively involved in several community projects, as well as to work alongside permafrost scientists, fish biologists, and wildlife biologists to learn more about and support their field work.

## Traditional/Local Knowledge

Given that Ka'a'gee Tu First Nation members and their ancestors have been using the lands and waters in the region for generations and have a rich history of oral storytelling, the land-users who participated in the project had rich insights to share. Climate-change adaptation planning had to be local in order to build on context-appropriate knowledge. Through the project, the community was well equipped to develop and document locally grown strategies to protect harvesting traditions. All Traditional Knowledge was applied consistently with the Dehcho First Nations Traditional Knowledge Protocol.



## What Was Learned

Community members had a desire to maintain their traditions, way of life, and to continue their close relationship with the land. Interviews identified a number of actions or adaptations that were already being practiced in the community to enhance safety for harvesters, and to promote communications within the community (the community would continue to be flexible and highly adaptable, both in where they hunted, but also in what they harvested). Although maintaining on-the-land traditions and remaining a close-knit community were mentioned as strengths of the community, there was a general concern that those strengths could be at risk in the future. Many community members were concerned that youth in particular are not as interested in traditional food and activities, and that they do not speak Slavey. There was a great concern among many interviewees that the language is being lost. Youth spoke only English and Elders mainly Slavey. Language was therefore seen as a major barrier preventing interactions between youth and Elders.

## Next Steps

To enhance the health of the community and aid in climate change adaptation, the community identified key initiatives: gardening, monitoring for changes on the land, activities that strengthen culture and social bonds, and recycling. These key initiatives formed the basis for the community adaptation plan and set the framework for future work in the community.

## Community Profile

Location: Kugluktuk, Nunavut

Population: 1,491

Land Area: 549.65 km<sup>2</sup>



### CONTACT INFORMATION

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# Kugluktuk, Nunavut

(2014-15)

### PARTNERS

Hamlet of Kugluktuk (David Yi), Arctic College (Emily Angulalik), Inuvik East Three School (Darlene Jean), and knowledge holders from Inuvik and Kugluktuk including Emily Angulalik, Lorraine Bolt, Colleen Nivingalok, and Mamie Oniak from Kugluktuk; Dennis Allen, Roy Goose, Lillian Elias, Leonard Harry, Shannon O'Hara, Willie Simon, and Janet Hurst from Inuvik

### PROJECT INFORMATION

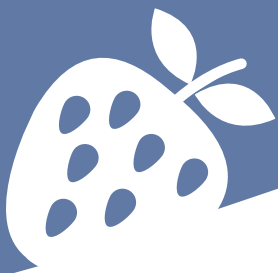
"Willow is Survival" Nauttiangit for a Changing Climate

## Community History

Kugluktuk, Nunavut, formerly known as Coppermine, is located in the Kitikmeot, the most western region of the territory. The community was named Kugluktuk meaning "a place of moving water", as it is situated where the Coppermine River meets the Coronation Gulf. Inuvik or Inuvik, means "living place" and is a regional centre for Inuvialuit culture. In Kugluktuk and Inuvik, harvesting country foods such as berries and caribou is becoming riskier as

the shrub layer thickens and unpredictable weather patterns make travel and harvesting more dangerous. The community infrastructure is vulnerable to flash floods, permafrost melt, and other climate-change related events. Thicker vegetation increases risks when on the land, since it is harder to see bears.





## Project Summary

In Kugluktuk, Elders worried that the increasing abundance of willow was making the landscape more dangerous for people searching for country foods. The project team wondered: was there a way to turn this negative effect of willow into something positive? Could people learn to harvest and use willow again, and in doing so, clear key paths and important berry patches so the over-abundant shrub layer is reduced?

## Research Activities and Capacity Building

- Four ethnobotany sessions were hosted with high school and college students in Inuvik and Kugluktuk. Students enjoyed working with Elders to renew their traditional knowledge and to discover useful skills using willow. Students learned how to construct a traditional willow shelter (or *qaluurvik*<sup>3</sup>) and make implements from willow as well.
- Eleven Inuit Elders were interviewed regarding their traditional knowledge of willow and climate change. A literature review documented and validated *Inuit Qaujimaqatuqangit* (IQ), and knowledge was also added that had not been written down in the past. An important component was the knowledge that was shared with young people who used it during fieldwork on the land.
- Vitamin C labs were conducted on willow buds and berries harvested from sites near willows. The abundance and diversity of berries near willow harvest locations was also tested, and a simple dendrochronology was conducted to establish the growth rate of willow.
- Elders and others from Kugluktuk and Inuvik exchanged ideas at an Inuvik Kativik (meeting). The meeting was documented in film, transcribed, and simultaneously translated into Inuinnaqtun and Inuvialuit. The translations enabled non-English speaking Elders to participate.
- Several short videos and one long video were produced and presented to schools and at a community meeting. The videos were presented in January 2015 at an international conference on sustainability in Copenhagen, Denmark. Written materials and videos were published on-line, on Facebook, and in hard copy in the “Inuvialuit Research Newsletter: directing Research at home” 2014–2015.
- The research was peer-reviewed and accepted for international publication in *Common Ground: International Journal of Climate Change*.

<sup>3</sup> **Qaluurvik:** is Inuvialuit for a dome-shaped house built from the bent-over limbs of arctic willow. These houses, which look like a snow block iglu when covered in snow, were used mainly in the winter months, although an Inuvialuit Elder advisor mentioned that the frames were also useful at other times of the year.



## Traditional/Local Knowledge

The project showed that with climate change, past uses of willow were becoming important again. Inuvialuit knowledge holder Roy Goose explained, “Climate change changed the road signs on the land”. Roy talked about how Inuit people always knew how to find their way by remembering clues from stars, landscape elements, wind direction, and other visual clues. As the climate and landscape change, clues change too. Inuvialuit Elder Lillian Elias agreed, “Young people get lost because of climate change. Elders get lost too, but they know how to survive. The younger ones don’t know what we know.”

## What Was Learned

Interviews and workshops with Kugluktuk Elders revealed interesting on-going uses of willow. Kugluktuk Inuit used willow for other purposes, such as a “blind” or woven willow fence that hunters would hide behind (Kugluktuk knowledge holder Lorraine Bolt). The blind made it possible to successfully hunt for food without being seen by birds or animals. Kugluktuk families also wove willow into floor and bedding mats, which were used to keep sleeping areas separate from the cold and damp ground (Kugluktuk knowledge holder Emily Angulalik). In most Arctic regions, willow shoots were used as survival food (Elder Mabel English) and willow bark was made into medicinal tea. The structural usefulness of willow as a building material was extensively explored through the construction of a *qaluurvik*, which is a traditional home structure that was once used on the land.

## Community Profile

Location: Inuvik Region, Northwest Territories

Population: 633

Land Area: 14.47 km<sup>2</sup>



### CONTACT INFORMATION

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# Aklavik, Inuvialuit Settlement Region

(2014-15)

### PARTNERS

Moose Kerr School; Billy Archie; Aklavik Elders, Hunters, and Youth

"We dedicate this to Edwin Dean Koulasuk, who suddenly passed away on June 25, 2015, in a fatal car crash. Eddie was a very strong supporter of community capacity building, and the love he had for his home community of Aklavik."

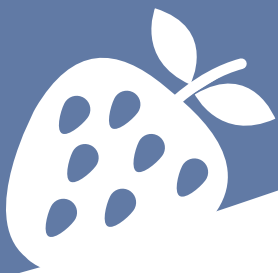
### PROJECT INFORMATION

Climate Change Impacts on Traditional Food Harvesting  
Safety and Community Health

## 50 Community History

Aklavik is the site of a traditional harvesting location of the Gwich'in and Inuvialuit. In 1910, Aklavik began to be permanently settled as fur traders moved into the area, followed by missionaries, government and other services. Today, over 90% of the population is Indigenous with the majority of people being Inuvialuit (62%) followed by Gwich'in (24%), then Métis and finally non-Indigenous. Languages spoken in Aklavik include Inuvialuktun, Gwich'in and English.

Aklavik people have been harvesting traditional foods such as whale, fish, caribou, moose, rabbit, berries and other traditional foods for as long as the people can remember. Elders still remember when the majority of food consumed by local people was made up of traditional food sources available on the lands and waters in the traditional lands surrounding Aklavik. Today local people are consuming more processed southern foods and the health of community people is becoming a concern as more and more chronic health issues are becoming common.



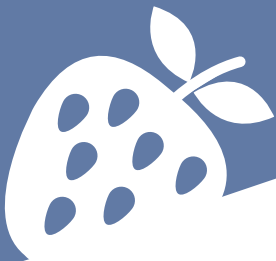
## Project Summary and Capacity Building

This community project was designed to collect data through observations during a traditional summer whale hunt and use of a survey questionnaire. Two community field workers were hired and 68 questionnaire surveys were completed. The data was used to explore if there were any linkages between the following questions, and to determine if there were any observations that stood out for the community members and harvesters who were directly experiencing changes on the land during their food and cultural harvesting activities. The questions were:

- Is there a linkage between climate change and a shift in diet from less traditional food being consumed to more modern foods being consumed and is this impacting on the health of people?
- Can Aklavik Elders assist in helping to understand any linkages between climate change, diet change and human health?
- Can Elders' traditional knowledge and their observations over time with respect to changes they have witnessed in the climate, in the diet changes of their children and grandchildren and the health of their community members help to explain some of the factors contributing to the health of community members?
- Is climate change causing a reduction in access to traditional food supplies because of safety reasons or due to environmental change impacting animals or marine life?
- Are youth and future generations at risk due to not being able to access traditional food sources and not learning about safety in travel and safety in preparing traditional foods?

## Traditional/Local Knowledge

- 29% of respondents noted that low water was a concern during their travel.
- 26% noted that spring ice break-up comes faster.
- 19% noted a concern with safety when travelling on the land.
- 24% noted that "weather changes too much" and "bad weather" was also mentioned.
- When bad weather was experienced, hunters did not usually venture out onto the rivers or the ocean. This was confirmed during the summer whale hunt at Shingle Point, as the Aklavik hunting party had finally decided to call off the hunt due to weather and time.



## What Was Learned

In Aklavik, the people had a lot to say about the land. The biggest concern was the erosions and landslides. A lot of places could be seen throughout the delta, where land was sinking and banks were falling into the rivers. Other concerns varied from pollutions, to people not taking care of the land as they did in the past. “Once the land is polluted, the animals will be polluted” – community member.

- Respondents noted that the main changes on the land and waters were “low water”, followed by “lots of erosion” during the spring and summer seasons.
- During the fall season, 59% of respondents felt that “low water, shallow water,” was the most noticeable change, followed by erosion at 24%.
- For the winter season, the number one noticeable change was that 19% felt that the ice was not as thick as it used to be, and 38% suggest that winter weather was warmer.
- Food sources: 59% ate mostly store-bought food compared to 24% who mostly ate country food, while 16% ate a mix of store-bought food and country food; although 96% of the respondents preferred to eat traditional foods.
- 77% of respondents indicated that a lack of required physical resources—gas, harvesting equipment and not having a snowmobile—was why they could not get traditional foods.

## Next Steps

Overall the project was successful, despite some early weather trouble, and the project team identified the following concerns moving forward:

- Climate change was hampering subsistence activities in the area, and poses ongoing risks to the hunters and trappers due to:
- Traditional food consumption dramatically declined due to climate change; and
- Potential environmental contaminants/viruses were a big concern, and analytical monitoring trends were recommended for all of the regularly consumed traditional foods.
- More efforts were required to update the “Aklavik Community Climate Change Adaptation Plan”
- Chronic disorder numbers should be monitored by health authorities (Aklavik Health Centre) to better track/monitor human health in the community (with a focus on dietary changes)



## Community Profile

Location: Nunavik, Quebec

Population: 376

Land Area: 26.60 km<sup>2</sup>



### CONTACT INFORMATION

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# Quaqtaq, Nunavik

(2014-15)

### PARTNERS

Qaujimautik Systems, GoOrganic Solutions, Ellen Avard (Universite Laval), Isummasaqvik School (Kativik School Board), Kuujuaq Greenhouse Committee

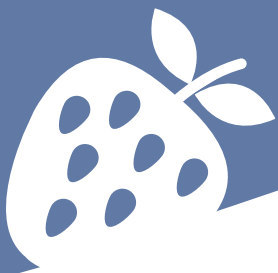
### PROJECT INFORMATION

Assessing the feasibility of a small-scale hydroponic rotating garden as an adaptation action with respect to community food security in Quaqtaq, Nunavik

## Community History

Quaqtaq is a village in Nunavik, Quebec. The village is one of the northernmost inhabited places in Quebec and is located on the eastern shore of Diana Bay (Tuvaaluk in the Inuktitut language). Historically, Inuit were self-sufficient in terms of food supply. Until the mid-20th century, the newly established communities began transporting southern-produced food items to provide a greater degree of food security to an ever-growing population. However, the southern-produced food items are expensive to transport, add to greenhouse gas emissions, and in the case of

produce, there are often quality issues related to long shipping times, as it takes much longer for the produce to reach its northern destination.



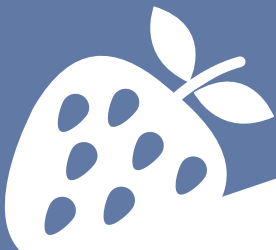
## Project Summary

The project assessed the feasibility of an indoor small-scale rotating hydroponic garden to grow several vegetables, fruits, and herbs. Since infrastructure is expensive to build in northern communities, the unit purchased for the project, which can house from 80 to 300 plants, was small enough to fit into a standard size closet and could utilize already existing space (empty offices, warehouse space, etc.). For the purposes of assessing the feasibility, the hydroponic unit was installed in an office at the Tuvaaluk Landholding Corporation.

For the first test of the small-scale rotating hydroponic garden, 60 heads of lettuce were germinated and sent to Quaqtq for installation in the unit. Ten students and two science teachers in Quaqtq maintained the unit for the first round of testing. Upon project completion, the unit was to be moved to the school in Quaqtq which would allow for more students to get involved in future growth cycles. During the project, the students identified several other vegetables that they could assess in the hydroponic unit including peppers, broccoli, and several different varieties of lettuce.

## Research Activities, Capacity Building and Traditional/Local Knowledge

- A community atlas was prepared using previously collected Traditional Ecological Knowledge (TEK and community interviews about plants (berry harvest locations).
- A literature review was compiled on hydroponics/northern greenhouses.
- A data collection protocol (TEK), a plant growth recording protocol, and an interview guide for TEK data collection were developed. Twelve community interviews were also conducted, and a staff member from Tuvaaluk Landholding also participated as a translator.
- 3,541 data records were organized into berries, food plant, kelp, medicinal plant, and other plant (wood). The furthest two data points span a distance of approximately 1,400 km indicating that the use of the land in Quaqtq by community members is vast.
- The calibrated hydroponic equipment and sensors were calibrated and installed and the data from the installed sensor platform can be viewed online. A carbon dioxide sensor was also installed (with accompanying temperature sensor) to measure carbon dioxide levels growing in the room.



- The first round of seed germination (done in Montréal) was ready for the hydroponic unit upon installation, so the first round of growth was instantaneous. Subsequent seed preparations would be done in Quaqtaq.

## Resources Developed

- A summary poster and a small brochure were prepared to highlight the project and noteworthy plant-growing techniques.
- A website specifications document was developed with accompanying a graphic design that outlined the specifications for the online portal. Presentation of real-time data from the unit and greenhouse sensor values are available in a MySQL database.

## What Was Learned and Next Steps

It was recommended that for future installations, hydroponic units should be installed in an available space that is not being used for regular business purposes due to the intense light and heat produced by the unit. Large projects also require a community champion that will keep moving the project forward while maintaining community and student interest. For best results, the project team recommended growing a single variety in the hydroponic unit, since different types of plants have specific needs. All plants within a single unit should also be transplanted at the same time on the same schedule. The project team proposed future work that would review, alongside current grocery chains in Nunavik communities, how much fresh produce is being imported and sold in the communities, in addition to a review of how much spoiled produce is thrown out. Such a review would give a good estimate of how much produce/what varieties of produce could be grown locally to reduce waste.



## Community Profile

Location: Sahtu Region, Northwest Territories

Population: 550

Land Area: 79.44 km<sup>2</sup>



### CONTACT INFORMATION

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# Délı̨nę, Northwest Territories

(2015–2016)

### PARTNERS

ʔehdzo Got'ı̨nę Gots'ę́ Nákedı́ (Sahtú Renewable Resources Board),  
Délı̨nę ʔehdzo Got'ı̨nę

(Renewable Resources Council), and the Centre for Sustainable Food  
Systems at Wilfrid Laurier University; as well as community members  
who generously shared their knowledge, experience and perspectives for  
this study.

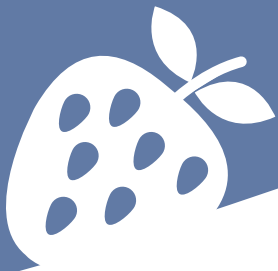
### PROJECT INFORMATION

Dene Nę́nę́ Gúlú gha Darade (Our Land is Changing):  
Climate Change, Food Security and Health in Délı̨nę

## Community History

The Délı̨nę First Nation is a Dene community on the shores of Sahtú (Great Bear Lake). The community has chosen a positive path of renewal and governance following a long history of change that started with the Port Radium radium-uranium mine on the eastern shore of Sahtú from 1932 to 1960. Community members began to notice the impacts of climate change on the land, and it is arguably the strength of the Délı̨nę Got'ı̨nę in the traditional land-based culture that

makes the community vulnerable to these impacts. With this project, Elders, harvesters and youth looked to the future and questioned how a healthy way of life might be sustained when the ecological conditions for its existence had fundamentally changed. The uncertainties and risks associated with climate change was an important reason why fewer community members were harvesting out on the land or were going out for shorter periods of time. There was a specific concern about



the decline of the Bluenose East caribou herd that had been a staple food source. The deep cultural and spiritual links to the caribou mobilized community members to become actively involved in caribou conservation actions that had direct implications for their food security.

## Project Summary

The decline of the Bathurst and Bluenose East caribou herds triggered a broad discussion about climate change, health and well-being, and food security in the community. The project aimed to 1) understand the role of country foods and the traditional practices in the daily lives of community members; 2) document changes in availability of country foods and threats to food security; and 3) identify food security adaptation strategies that have been adopted in the past and possible strategies for the future.

## Research Activities and Capacity Building

Climate change vulnerability and adaptation strategies were explored through a collaborative Community-Based and PAR<sup>4</sup> methodology. This ensured that the research was community driven and that it responded to the expressed needs of the community.

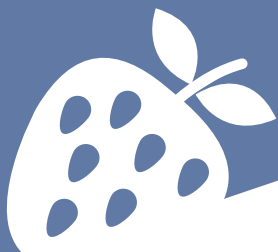
Workshops and community events were held to collaboratively develop and address the research questions related to food security, health and well-being, and climate change—approximately 30–44 community members participated across the sessions. These inputs were the basis for 13 semi-structured interviews/focus groups with Elders, harvesters, women and youth. A workshop with key knowledge holders was also held so that preliminary adaptation strategies could be further discussed and explored, ultimately resulting in a food security adaptation plan for the community. Two food security camps in spring and fall (one per season) provided opportunities for experiential learning and knowledge exchanges about challenges and opportunities in maintaining skills, cultural knowledge and sharing as a basis for a food security and adaptation plan.

## Communications

Preliminary results of the study were presented to the community at a workshop on February 20. This provided an opportunity for community members to learn about and comment on research findings prior to the finalization of reports. Individuals had the opportunity to approve any direct quotations being used in reports and publications. The results workshop also allowed for a discussion on “Next Steps” to determine what actions the community wanted to take to address findings. This was part of the iterative process that is essential to PAR and is a basis for future work in the community. Approximately 30 people attended the results workshop, including community members and academic researchers.

<sup>4</sup> For a definition of PAR, please see Kluane, Yukon (2013–14) (page 33).





By permission of the Délı̨nę community, project results were disseminated through the annual Sahtú Environmental Research and Monitoring Forum, the Cross-Cultural Research Camp, other regional forums, Facebook, and the popular media. It was proposed that this case-study experience with Délı̨nę should be generalized into a model for conducting similar food security vulnerability assessments and planning exercises with a toolkit that could be adapted for use by other communities.

## What Was Learned and Next Steps

On the basis of the two on-the-land trips and series of interviews with 13 community members, the project identified four themes—environmental health, community health, learning from the past, and new adaptations—as Délı̨nę entered a new era of self-government. At the same time, the SRRB and Délı̨nę ʔehdzo Got'ı̨nę were reframing their relationship to support implementation of the community's Belare wı̨le Gots'ę ʔekwę—Caribou for All Time Action Plan. The action plan was well-timed as a supplement to the community's caribou conservation efforts, by providing a vision for continued food security and community health in the context of climate change.



# Adaptation Planning

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“The near inevitability of accelerating impacts in the Arctic and globally between now and mid-century reinforces the urgent need for local and regional adaptation strategies that can reduce vulnerabilities and take advantage of opportunities to build resilience” (AMAP, 2017).

Communities across the North are particularly vulnerable to climate change, and as such, adaptation planning has become a necessary reality in order to ensure sustainability into the future. Felt across the natural landscape, changing access to country foods and travel, impeding local infrastructure development and planning, as well as rendering existing capacity inadequate, climate change impacts are pervasive. Many local governments are already at the centre of this reality, with the effects of melting permafrost still largely unknown (ICLEI – Local Governments for Sustainability, 2015). Climate change impacts on permafrost regions are being monitored, as many northern First Nations and Inuit communities reside on these sites. Land areas that are unstable upon thaw (land erosion, slope failure) pose a concern as they may have safety implications for existing homes and infrastructure. Understanding the changing landscape is also important for communities as they rely on the land to safely hunt, gather country foods, travel to see loved ones, and for healing.

In order to prepare for and adapt to the changing environment, adaptation planning is a balance of immediate and long-term needs, and many communities will need to develop a holistic response to such needs (ICLEI – Local Governments for Sustainability, 2015). A holistic response involves the coordination of and collaboration with various partners across the North, including community members, Elders, youth, local and national governments, service providers, and scientists. Moreover, given that climate change impacts are felt across borders, it is increasingly imperative that partnerships and collaborative efforts are made in order to create sustainable action plans.

With the release of the Pan-Canadian Framework on Clean Growth and Climate Change in 2016, the Government of Canada made a commitment to action, and a commitment to work collaboratively with the Assembly of First Nations (AFN) and Inuit Tapiriit Kanatami (ITK) to address the risk of runaway warming in the Canadian Arctic:



“...a structured, collaborative approach for meaningful engagement will be pursued between the Government of Canada and First Nations. This will ensure that First Nations are full and effective partners in achieving climate change goals to mitigate and reduce emissions as a necessary precursor to the mitigation of climate impacts on First Nations” (Statement by the Prime Minister, Justin Trudeau, and the National Chief of the Assembly of First Nations, Perry Bellegarde, 2016).

“Together, we will translate scientific information and Inuit knowledge into action to support adaptation, and support the sharing of information...” (Commitment to action by the Prime Minister of Canada, Justin Trudeau, and the President of Inuit Tapiriit Kanatami, Natan Obed, 2016).

As the second largest focus area within the CCHAP’s 2012–2016 cycle, 13 funded community projects focused on adaptation planning. Many of the community-led project activities included vulnerability assessments, short-term and long-term monitoring, and the establishment of baseline data. Northern communities recognize that changes to the land are having impacts on their way of life and are working towards finding means to connect the guidance of the past with the new requirements of life today. Their stories tell of ways in which traditional and scientific knowledge are collaborating to provide greater insight into climate change impacts, and how they are adapting to these changes to ensure the health and well-being of their communities.



## Community Profile

**Location:** The settlement of JMR is situated at the confluence of the Jean Marie and Mackenzie Rivers, 127 kilometres east of Fort Simpson, Northwest Territories

**Population:** 76, with the JMRFN having a total membership of 138

**2011 Census Land Area:** 37.29 km<sup>2</sup>

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# Jean Marie River, Northwest Territories

(2012-13)

### PARTNERS

Ryan Brown – Watertight Solutions Ltd., Dr. Fabrice Calmels – University of Alberta / Yukon College, Cyrielle Laurent – PACTeam Canada Inc., and Dr. Frédérique Pivot – Athabasca University

### PROJECT INFORMATION

Permafrost vulnerability assessment and landscape changes related to climate change in the Jean Marie River First Nation

## Community History

Traditionally, the Tł̨́t̨́s'ė́h̨́k'ė́ Dė́ĺ̨ got'ine people occupied the Jean Marie River area and traveled within what is now called the Dehcho region of the Northwest Territories. For countless generations, their ancestors pursued a traditional lifestyle. In the early 1920s, however, the transition from a nomadic lifestyle to living in a more permanent settlement began, but the people continued to travel out from

the settlement on a seasonal basis to camps spread out over the traditional territory. Some families remained at outlying lakes for years, only traveling into JMR and Fort Simpson for special occasions and supplies.



## Project Summary

Eager to take action, the community completed a vulnerability assessment regarding the impacts caused by climate change, and identified principal issues and concerns. A concern was that areas in the community could be potentially affected by warming permafrost, and housing and infrastructure could be vulnerable to related risks and hazards. To address this issue, it was necessary to locate these areas and to assess their vulnerability to permafrost degradation. It was also necessary to understand the health implications of permafrost degradation and resultant landscape and ecosystem changes from a cultural perspective.

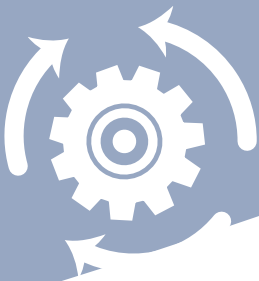
The changes in the landscape in specific areas induced by permafrost thawing were starting to impact the ability of the community members to access country foods. Concerns within the community were arising due to observed changes. For example, shrubby area abundant in berries or a feeding ground for certain wildlife species—if permafrost erodes, these areas could become unsuitable for certain plant species or deserted by wildlife species that were an important source of country foods, medicine and income.

Climate change is causing the present ecology of the region to become increasingly out of balance, and is resulting in a myriad of health implications. Thus, it was important for the community to find ways to respond to climate change that were aimed at restoring this balance to the best of the community's ability and resiliency.

## Research Activities

- Traditional and local knowledge was gathered concerning environmental and cultural changes related to climate change.
- The community conducted a focus group mapping session with three participants, a geological survey which included three excavations, a vegetation survey and an air photo survey of JMR and the surrounding area to locate vulnerable areas of land—mainly potentially ice-rich permafrost terrains.
- The community compiled relevant literature, held three community meetings, and completed scientific surveys, analyses, and previous engineering studies to inform the community vulnerability assessment
- The main long-term objective of this project was to provide a tool for land use and community planning for JMR.





## Capacity Building

A GPS training workshop was conducted with eight youth. The workshop was split between classroom instruction and practical fieldwork training, and provided essential skills such as travelling on, navigating, and using the land in a safe manner. Two days of Unmanned Aerial Vehicle (drones) training was also provided to show how the equipment could be used for scientific purposes, and the youth were able to work with it by themselves.

## Traditional/Local Knowledge

For JMRFN, maintaining culture and traditional practices meant in part, traveling on the land and harvesting resources. Changes in weather and on the land began to make these actions increasingly more difficult. Traditional trails were “sinking” with thawing permafrost and annual migration patterns were no longer as predictable as they once were. The community was experiencing things that they never have before, things that they would have to adapt to if their culture and way of life were to continue.

## Resources Developed and Communications

A final community meeting was held to share project results, and to showcase the permafrost vulnerability hazard maps that were produced. The hazard maps acted as a decision-making tool for JMRFN to develop in secure areas and to explore proactive adaptation strategies for climate change and health-related impacts.

## Next Steps

This project was the first step for the community to proactively address climate change and health-related issues associated with permafrost degradation. In addition to maintaining existing houses and infrastructure, JMRFN has needs for new development, which made this project essential for future planning. A proactive approach is imperative as there are numerous examples of collapsing buildings, roads, and air strips documented across the North, representing the hazards that the community wants to avoid as much as possible now and in the future.

The community also expressed an interest in developing a community gardening initiative to grow their own food, and to build a root cellar to store such food, to improve and enhance JMR's food security. The mapping of geological hazards related to permafrost degradation will also be essential for planning such projects in safe and secure locations.



## Community Profile

Location: North West River, NL

Population: 500

2011 Census Land Area: 36.95 km<sup>2</sup>

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# Sivunivut, Nunatsiavut

(2012–2013)

### PARTNERS

Labrador Institute of Memorial University, Bryan Wood, Martha MacDonald,  
Keith Chaulk, Jamie Jackson, Rebecca Watts, Noetix Inc.

### PROJECT INFORMATION

Traditional Knowledge: A Blueprint for Change, Stage II

## Community History

North West River is a small community located at the confluence of Lake Melville and Grand Lake, approximately 40 km northeast of Happy Valley-Goose Bay, Labrador. Although North West River is physically outside Nunatsiavut, Inuit residents of the community are beneficiaries of the Nunatsiavut Government, and are represented in the Nunatsiavut Assembly by the Chairperson of Sivunivut, the Inuit Community Corporation.

Located in a transitional environment, it is predicted that the Lake Melville region will undergo pervasive transformations as a result of climate change. For example, changing temperature and precipitation patterns threaten to alter plant and animal distributions, which in turn will impact the lifestyles (i.e. the culture and society) of the Inuit community in North West River.



Due to the reliance on country-based activities and a cultural relationship with the landscape, the Inuit of North West River were concerned that climate change poses a direct threat to their food and water security, and to winter travel as a result of compromised ice conditions.

In the face of these threats and the community's concerns, Sivunivut saw a need to record the current land-use and cultural practices of the community, as well as to identify methods that will mitigate the impacts of climate change on the local lifestyle. Southern Inuit communities such as North West River are the “canary in the coal mine,” and act as an early regional indicator of the health risks posed by climate change all across the North.

## Project Summary

Stage I “Traditional Knowledge: A Blueprint For Change” was completed in 2010–2011. The overall goal of the Project was to train Inuit residents of North West River, Labrador to collect and map ecological knowledge of other Inuit in the community and record their observations of on-going landscape transformations in the Lake Melville-Grand Lake region. Stage I participants commented that it was difficult to use the government-generated maps because they did not include local place names, and there was some concern that this could cause trouble in the future as place names were lost, or transposed to other locations. Based on Stage I feedback, Stage II conducted three place name focus groups with participants from Stage I, to identify and map local place names. These place names were added into the Geographic Information System (GIS)<sup>5</sup> database created in Stage I. Fourteen detailed interviews were also conducted, focusing on locations that were found to be the most significant to the community. Witnessed changes at important locations over time, as well as the local histories

of these locations (i.e. stories, songs, etc.), were recorded. Finally, due to unpredictability and timing, the project team established a satellite imaging service to monitor the lake ice on Grand Lake and Lake Melville during the appropriate seasons.

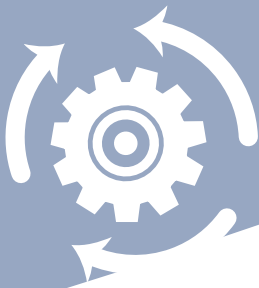
## Research Activities

The research process is analogous to how the Inuit have adapted to climate change throughout their history in the Arctic. Historically, they have used oral history and experiential expertise from the land to understand how the environment has changed in the past, how it functions at present, and how it may change in the future, as well as what they may need to do to continue to live and thrive in the face of these ecological transformations.

## Traditional/Local Knowledge

The project showed that community members possess vast amounts of knowledge about their local environment. As the project participants have shown, people who spend a lot of time on the land and who rely on it are keen observers of the environment. They are aware of changes when they occur, and they have their own beliefs as to why they occurred. Community observations are based on careful consideration of patterns and events experienced over the course of their lifetime, and they are grounded in conversation with other knowledgeable land users in the community. This expertise is recognized by their fellow community members and is often drawn upon by less experienced land users, and researchers alike.

<sup>5</sup> **Geographic Information System (GIS):** is a computer system for capturing, storing, checking, and displaying data related to positions on Earth's surface. GIS can show many different kinds of data on one map, such as streets, buildings, and vegetation. This enables people to more easily see, analyze, and understand patterns and relationships (National Geographic, 2017).



## Resources Developed

Various deliverables were produced as a result of the three place name workshops, the 14 detailed interviews, and the ice-monitoring program. Results of the project have been added to the GIS database, and include audio-video clips and photographs from the interviews and outings, local place names and additional resource locations. The GIS database was a significant outcome: as traditional knowledge is recorded and archived, it can be studied directly and used to plan and undertake future studies. The maps produced using the database were to become an interactive and visual experience that community members could use to connect the past, present and future.

## Communications

Maintaining a close relationship with the community, the project team updated community members about the project's progress on a regular basis. An update was published in SICC's Newsletter; the community researcher gave a presentation at the SIC AGM; Noetix made a public presentation on the ice monitoring system; news reports were carried on CBC and APTN; the project was recognized by the Memorial University of Newfoundland as an example of good community engagement; an overview of the project was published in *Labrador Life* (Jackman & Neilsen, 2013) and a community event was proposed to discuss project results and future plans, and to honour the participants. The project also helped fund the publication of Louie Montague's book, *I never knewed it was hard*, which focuses on his 70+ years living in the region.

## What Was Learned

From the Place Name workshop, Elders contributed 408 place names, the middle-aged group provided 268, and the youth group yielded 114. The results showed that with each generation, knowledge pertaining to place names and the place names themselves is being lost. The detailed interviews (14) also offered insight into witnessed environmental changes to the region over time, and about 1,000 minutes of audio and video was recorded. Finally, the collection assistance of Noetix Inc. allowed the project team to access Radarsat and MODIS satellite images of ice over a large portion of Lake Melville and Grand Lake. The geographic images were a great resource to compliment the environmental monitoring proposed for Stage III.

## Next Steps

Stage III of the project is envisioned as a long-term monitoring program in which locations that are significant to the community, as identified by the local experts in Stage II, will be visited repeatedly in all seasons for a number of years. In Stage III, the purpose of each visit will be to record and monitor the physical characteristics of each significant site, which would include parameters such as water temperature, high water mark, vegetation cover, snow cover, ice thickness, human activity, animal presence, precipitation, etc. Fieldwork will provide a physical account of the transformations occurring at these locations, which could help Sivunivut plan for the future. Conducted over a number of years, these observations will provide a detailed record of local weather and longer-term ecological transformations occurring at the selected locations, which are significant for the community.



## Community Profile

Location: Nain, Nunatsiavut

Regional Population: 2,400

Land Area: 72,520 km<sup>2</sup>

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# Nain, Nunatsiavut

(2013-14)

### PARTNERS

Nain, Hopedale, Makkovik, and Rigolet Inuit Community Governments through the SakKijānginnatuk Nunalik (Sustainable Communities) initiative; the Housing Working Group which includes the Minister of Nunatsiavut Affairs, Nunatsiavut Secretariat (President's Office), Nunatsiavut Affairs, the Department of Health and Social Development as well as the Department of Lands and Natural Resources; Nain Research Centre; Regional Housing Association; Memorial University: Dr. Trevor Bell; Trent University: Dr. Chris Furgal; Government of Newfoundland and Labrador: Executive Council, Office of Climate Change, Energy Efficiency and Emissions Trading; Canadian Mortgage and Housing Corporation, Bill Semple; and FoTenn Planning and Urban Design: Michelle Armstrong\*

### PROJECT INFORMATION

InosiKatigeKagiamik Illumi: Healthy homes in Nunatsiavut

## Community History

Nunatsiavut is the newly formed Inuit self-government region of Labrador, and the political boundary for five logistically isolated Inuit communities only accessible by air, boat or snowmobile. Nunatsiavut communities are rapidly growing and changing, placing new pressures on planning for sustainable, healthy communities. At the same time, climate change is having an increasingly pronounced impact in the region, affecting infrastructure, community services/programs and the health and well-being of residents. The ability of the Inuit community governments to meet the

ongoing need for rapid community expansion is severely constrained by a lack of available building land, the high costs of development and the incessant need to repair and replace existing homes. Consequently, it is estimated that 38% of children in Nunatsiavut live in a home needing major repair (41.6% of the total population), while a study found that 86% of homes show signs of damage stemming from ground subsidence and permafrost thaw. These homes are failing from critical defects within the first 10 years of their construction.





## Project Summary

This action-oriented housing initiative addressed Inuit housing needs to invest in infrastructure integrity for the future, amidst a changing climate. Through the design and construction of culturally relevant, affordable, energy-efficient, climate-adapted housing, the project team hoped to slow the rapid pace of infrastructure deterioration that was currently experienced in the region. They also hoped to reduce the burden of overcrowding and mold, and by extension, contribute positively to the mental and physical health and well-being of residents.

## Research Activities and Resources Developed

Fieldwork for a housing risk assessment involving the communities of Nain, Hopedale and Makkovik was completed. The risk assessment identified factors that were leading to premature housing failure in the context of the local environment, changing climatic conditions and community characteristics. With support from the Nunatsiavut Government, Inuit community governments, and community residents, a team of architects and engineers carried out an in-depth survey that included a thorough visual inspection, a blower door test and an infra-red scan to assist in measuring the energy efficiency of each home. The assessment included architectural, airtightness and thermal imaging, as well as geotechnical, structural, mechanical and electrical components. In most cases, the occupants of houses also shared personal insights on problem areas in the houses. A separate report entitled “Nunatsiavut Housing Risk Assessment – final” was created. A community-driven housing design process called a “charette” was also held in Nain, and it was the first time community members have been actively engaged in the discussion of housing challenges and preferences related to designs. A separate report entitled “Nunatsiavut Housing Design Charrette – final” was created and included important cultural values informing the design.

## Traditional/Local Knowledge

Many of the existing housing issues in the region stemmed from a complete lack of consultation with Labrador Inuit during the initial housing design and construction phases. Current housing models built in Nunatsiavut assumed that residents would exhibit the lifestyle norms of a nuclear Euro-Canadian family. Not only were the designs ill-suited to the environmental process of the region and the additional stresses posed by changing climatic conditions, they were culturally inappropriate and did not accommodate the needs of traditional Inuit activities (such as processing country food, storage of equipment/supplies, etc.) or family living preferences. The need to incorporate Inuit Knowledge into the housing design process was a significant motivation for the project. Following the funding year, Nunatsiavummiut continued to direct, guide and manage the housing project with the goal of producing future housing in Nunatsiavut that is designed and built by Inuit, for Inuit.

## Next Steps

A prototype multi-unit, climate adapted dwelling was in development, and was to be monitored for health indicators, climate/environmental resilience, energy performance and resident satisfaction before modifying and replicating the model in other communities.



## Community Profile

Location: Tulít'a, Northwest Territories

Population: 552

Land Area: 52.12 km<sup>2</sup>

### CONTACT INFORMATION

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# Tulít'a, Northwest Territories

(2013-14)

### PARTNERS

The Pembina Institute, and the five ʔehdzo Got'ine of the Sahtú Region: Colville Lake ʔehdzo Got'ine, Dél'ine ʔehdzo Got'ine, Fort Good Hope ʔehdzo Got'ine, Norman Wells ʔehdzo Got'ine, and Tulít'a ʔehdzo Got'ine

### PROJECT INFORMATION

Staying Strong: Sahtú Youth and Elders Building Healthy Communities in the Face of Climate Change

## Community History

Tulít'a is home to the Shú htagot'ine (Mountain Dene people), the Dé got'ine (River People) and the K'á alogot'ine (Willow Lake people), who make up about 80% of the local population. Tulít'a (formerly Fort Norman) is named for its location where the Great Bear River flows into Deh Cho/ Mackenzie River, "where the waters meet." The Tulít'a Dene and Métis are resilient people who have always had to adapt to a challenging climate and waves of significant social, cultural, economic and other changes over the past two centuries. In the past 50 years, the northern Northwest

Territories has been warming a rate much greater than the global average. In the Sahtú Region, mean annual temperatures are expected to rise significantly into the future. The impacts of climate change have already affected travel out on the land, as well as wildlife and associated harvesting practices and food security. Together with the environmental and socio-economic changes that oil and gas activity in the region may bring, the pace and scale of the changes facing Tulít'a may be stretching local adaptive capacities.



## Project Summary

This project involved youth, Elders, and other community members in Tulít'a and the Sahtú in research related to community health and climate change. As the future leaders of their communities and those who will be most affected by climate change in the decades ahead, the project gave youth a solid foundation in both traditional knowledge and climate science, expanded their creative abilities to communicate and solve problems, and connected them with other motivated youth, knowledgeable Elders and resource professionals from across the North.

## Research Activities

A modified collaborative and cross-cultural methodology, including an Action Research influence, was utilized for several project components. It was hoped that the involvement of youth throughout the research process might, in some small ways, support future Dene and Métis leadership and self-governance in the region. Under the methodological approach, a range of activities were undertaken for this project, such as focus groups, semi-structured and qualitative interviews, two on-the-land trips, presentations, workshops, as well as skill-building and communications work with youth participants.

## Capacity Building

Twenty-seven youth participated in the Tulít'a community hunts, which engaged them in skills-based traditional knowledge, North Slavey language, and on-the-land trapping, harvesting and survival training. Tulít'a youth were also engaged in training and skill-building opportunities to work in team-based multimedia environments, database creation and maintenance, qualitative research methodologies including interviewing and focus groups, social media management, digital strategy, and public speaking. A photo book and a ten-minute audio documentary were in production upon project completion.

## Traditional/Local Knowledge

An emphasis was placed on traditional knowledge in the discussion of climate change impacts and adaptation measures in Tulít'a and the Sahtú. Stories and observations of climatic and other environmental changes told here included predictions of warming temperatures, and experiences with permafrost degradation, changing wildlife patterns, and new challenges in travelling out on the land. Central themes were raised repeatedly by participating Elders and youth as sources of community vulnerability, but also as areas with resilience potential; these themes included the Dene language, identity, traditional knowledge, stories, and way of life, with the land being the basis for all these things.



## What Was Learned and Next Steps

Despite the involvement of a climate scientist in the project, participants did not wish to examine the Western scientific understanding of climate change in great detail. Rather, climate change was frequently situated within a broader discussion of ecological, social and cultural changes that were being experienced in Tulít'a and the Sahtú—including the resource exploration activity that was taking place in the region during the project activities. As one project member put it: “one possible reason [that participants did not wish to examine the Western scientific understanding of climate change] could be that while it can be difficult to deal with abstractions such as global climate change scenarios, shale oil exploration is an immediate experience for residents of the Sahtú”. Through ongoing efforts to help foster relationships of mutual support between Elders, youth and other community members in the Sahtú—rooted in strong relationships with the land—it was hoped that a solid foundation for more comprehensive climate change and health adaptation planning would be established.



## Community Profile

Location: Tulít'a, Northwest Territories

Population of the Sahtú Region: 2,560

Land Area: 41,437 km<sup>2</sup>



### CONTACT INFORMATION

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# Tulít'a, Northwest Territories

(2014-15)

### PARTNERS

The Pembina Institute, and the five ʔehdzo Got'ine of the Sahtú Region: Colville Lake ʔehdzo Got'ine, Délıne ʔehdzo Got'ine, Fort Good Hope ʔehdzo Got'ine, Norman Wells ʔehdzo Got'ine, and Tulít'a ʔehdzo Got'ine; Shauna Morgan, Kristen Kodakin-Yakeleya, Eugene Boulanger, Dr. Deborah Simmons, Joseph Hanlon, and Lucy Jackson

### PROJECT INFORMATION

Overcoming Fear: Sahtú Youth Network Initiative on Health and Climate Change

## Community History

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The Sahtú Region of the Northwest Territories (NWT) is made up of five communities, each with its own local dialect: Colville Lake (Behdzi Ahda First Nation), Fort Good Hope (K'asho Got'ine First Nation), Norman Wells (a mix of First Nations people from the other communities), Tulít'a (Shúhtagot'ine and K'áalogot'ine), and Délıne (Sahtúgot'ine). Approximately 40% of the Sahtú population is under 25 years of age, so a focus on youth in the strategic planning of community health was a critical priority. The people of the Sahtú Region are particularly vulnerable to climate change because they still rely to a great extent on food and resources from the land.

## Project Summary

This project was the latest step in a multi-year journey by Sahtú communities in the Northwest Territories to address the impacts of climate change on individual and community health, through the cultivation of youth leadership. Expanding on previous Health Canada-funded, youth-led projects in Tulít'a, Délıne and Fort Good Hope, this project adopted a fully regional lens for the first time. The project involved the formation of a regional Sahtú Youth Network (SYN) whose members led the investigation and conducted interviews with Sahtú Elders and harvesters. Over the course of the project, with input and guidance from Elder advisors and the Project Team, SYN participants identified





“environmental determinants of health” related to climate change in the Sahtú, mapped the connections between climate change and environmental and human health effects, and identified priority actions. Investigation methods were focused on experiential learning on the land.

## Research Activities

- Sahtú Research Results workshop: the Sahtú Youth Network (seven youth) made a collective presentation to about 50 people, including scientists and researchers from various government agencies and universities, government program managers, traditional knowledge specialists, representatives from the Sahtú Environmental Research and Monitoring Forum, representatives from each of the Sahtú communities (ʔehdzo Got'ıne and Land Corporations), as well as various local onlookers.
- Two youth from each of Tulı́t'a and Fort Good Hope worked collaboratively to organize on-the-land trips to familiar locations, during which they filmed GoPro videos and screened them at the March 2015 workshop.
- March 2015 action planning workshop: a workshop with Sahtú Youth Network members from each of the five Sahtú communities as well as Elder advisors was held in Tulı́t'a, from March 24–26, 2015. Nine SYN members attended, as well as three Elder advisors (including an interpreter), four high school students, and three facilitators. The workshop included a combination of facilitated discussions, break-out groups and opportunities for one-on-one interviews.
- From July 4–11, 2015, the ʔehdzo Got'ıne Gots'ę Nákedı and the Fort Good Hope ʔehdzo Got'ıne co-hosted a Sahtú Cross-Cultural Research Camp held at Sans Sault rapids along the Mackenzie River. One of the main objectives of the camp was to contribute to the training and certification of Sahtú young people in training to become Environmental Monitors. There were ten Sahtú young people in attendance, several of whom are SYN members.
- A workshop was held by the ʔehdzo Got'ıne Gots'ę Nákedı (Sahtú Renewable Resources Board) with the aim of ensuring better regional coordination and control over environmental research and monitoring. The workshop resulted in the establishment of the Sahtú Environmental Research and Monitoring Forum, which includes representatives from Sahtú community organizations and youth (forming the majority), government and industry.
- A vulnerability assessment was conducted for the Sahtú Region, and addressed broader socio-cultural shifts linked to climate change such a growing need for language revitalization and higher education in scientific fields.

## Capacity Building

Sahtú Youth Network members played an important role throughout various aspects of this project: participating in workshops, conducting on-the-land investigations and interviews, participating in SYN visioning and website development, as well as meeting with Dechinta Initiatives representatives. Between two and four youth from each Sahtú community participated in this project, including equal numbers of young men and women. The invaluable work and input of all the youth participants was acknowledged.



## Traditional/Local Knowledge

The focus of the vulnerability assessment and the action planning process was neither to compile a complete collection of “traditional knowledge” about climate change in the Sahtú, nor to sort climate change observations into categories of “traditional” and “scientific.” Rather, the project team approached the problem by drawing upon Indigenous ways of knowing and learning, with an emphasis on finding solutions rooted in Sahtú leadership and increased self-determination.

## What Was Learned

The following environmental determinants of health related to climate change were identified within the Sahtú Region:

- Landslides, slumping and siltation along rivers in the Sahtú
- Water quality and quantity changes
- Dryness and forest fires
- Changes in ice and snow conditions
- More unpredictable weather patterns – storms, wind, etc
- Warmer water temperature – mercury, fish health
- Wildlife health

The above environmental determinants of health put several community health values at risk: cultural health, physical safety, food security and nutrition, and mental and emotional health. While many of the health impacts are expected to become more severe over the long-term, cultural health impacts are being felt immediately with high severity. For this reason, the SYN participants determined that one of the most important ways to increase the adaptive capacity of Sahtú communities in dealing with climatic changes was to strengthen the transmission of Sahtú Dene and Metis culture between Elders and youth.

The regional action plan created by the Sahtu Youth Network included the following main priority actions:

- Build healthy relationships between youth and Elders
- Promote Dene language revitalization
- Promote on-the-land learning and safety skills while travelling across the land and water
- Gain more education to become scientists and researchers
- End dependence on fossil fuels

## Next Steps

The next step was to nurture a self-sustaining Sahtú Youth Network engaged on health and climate change issues. The Regional Action and Communications Plan helps to guide the network through the transition past this project, and the hope is that SYN members will be empowered with new tools to make healthy choices in their lives, overcome fear associated with speaking up and becoming leaders in their communities, and build the knowledge and confidence needed to face a future of unprecedented climate change.

## Community Profile

Location: Yellowknife, Northwest Territories

Land Area: 1,000,000 km<sup>2</sup>



### CONTACT INFORMATION

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# Denendeh, Northwest Territories

(2014–15)

### PARTNERS

Ikan Innovations Inc.; Dawn Trembly, Ecology North; Five Regional Governments: Gwich'in, Sahtú, Tlicho, Dehcho and Akaitcho

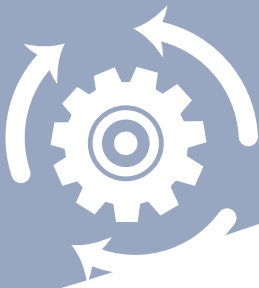
### PROJECT INFORMATION

Climate Change Observations in Denendeh

## Community History

The Dene Nation is an Indigenous governmental organization serving 29 Dene Chiefs and communities in Denendeh. The Dene have always called their homeland “Denendeh” which means the “Land of the People.” Denendeh is located in the western part of the Northwest Territories in northern Canada. The Dene Nation mandate is to advocate, inform and coordinate on Dene issues, and work in close cooperation with members from the five regional Dene Governments of Gwich'in, Sahtú, Tlicho, Dehcho, and Akaitcho. They work at the community, national,

and international levels and have been advocating on behalf of the Dene people since 1970. Climate change is already affecting northern communities in Denendeh (Northwest Territories). With the impacts of climate change increasing, there was a need to educate the people and communities on how to prepare for the future. Climate change threatens infrastructure, transportation systems, traditional foods and water security. It also impacts cultural activities and human health. It was important for the community leaders to understand the impacts of climate change to create strategies for adaptation.



## Project Summary

As the climate in the Arctic warms up, extreme weather events are expected to increase. Through surveillance work, Denendeh communities needed to document climate change impacts and weather events, while also reporting on any abnormalities in traditional foods and plants. For this project, the Dene Nation proposed to conduct research and a series of regional workshops (Dene National Assembly, Dehcho Assembly, Tlicho Assembly, Akaitcho Assembly) on climate change, as well as to create an online observation database to inform Elders, youth, and leaders about climate change and in turn get their feedback. As a result of project activities, an observation form was presented to the Denendeh communities.

## Research Activities and Capacity Building

Training on setting up and using a survey program was provided by Ikan Innovations Inc. A local technical consultant for IT also provided training to the staff, helped with the website, and created video instructions for any new staff from the Dene Nation. The training showed how surveying methods could provide quick results for analyzing trends in a climate change database, especially with the input of new data. The survey instruments allowed them to obtain specialized information from communities living on the land throughout the North.

## What Was Learned

Additional findings from the online survey work were consistent with reports from the regional workshops, which pointed to the environmental changes that people see across Denendeh. Overall, survey participants were quick to point out changes observed on the land, in the waters, and among wildlife, as well as changes to weather patterns. It was more difficult to single out health impacts, except for the common concern expressed about food security. However, changes to wildlife behavior and migration raised more fears than anything else, as connections were made between the loss of country food and climate change. There were also a number of people who were critical that more was not being done, which reflected a minority of Dene who are cynical about anything being done about climate change.

## Next Steps

The issue of climate change is certainly in the minds of people across the North and the increase in wildfires, low water levels, and the appearance of new species are the most common observations. Moving forward, observations of more health impacts will require long-term monitoring and research programs, which most community members felt should be undertaken by the Dene communities themselves, working alongside health professionals. In terms of food security mentioned above, there was an obvious need for capacity building in Dene communities to conduct environmental and wildlife monitoring, and people were increasingly concerned about contaminants like mercury and POPs accumulating in wild food sources. The Dene Nation will continue seeking more resources to build on the work previously done. Furthermore, there was a need to strengthen community-to-community coordination so that key issues could be addressed collectively.

## Community Profile

Location: Yellowknife, Northwest Territories

Land Area: 1,000,000 km<sup>2</sup>



### CONTACT INFORMATION

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# Denendeh, Northwest Territories

(2015-16)

### PARTNERS

Craig Scott, Ecology North; Regional Governments: Gwich'in, Sahtu, Tlicho, Dehcho and Akaitcho

### PROJECT INFORMATION

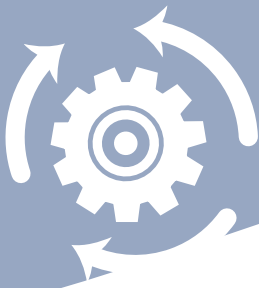
Climate Change and Health Effects in Denendeh

## Community History

In Denendeh, community and leadership members were concerned with the changes they were witnessing due to the warming climate. Climate change is altering northern communities in Denendeh (Northwest Territories) and Dene (First Nations) with negative impacts such as changing landscapes, thawing permafrost, changes to traditional food, infrastructure, and transportation systems. It also impacts cultural activities and health. Unfortunately, most climate change research to date is from a resource development perspective, often produced for the private sector or

for regulators of development activity. Therefore, it was important for the Dene, especially the community leaders, to understand the impact of climate change in order to prepare adaptation strategies that could be created to better prepare for the future.





## Project Summary

The Dene Nation promoted awareness about climate change adaptation and facilitated discussion amongst Dene Nation delegates at their Annual Assembly. The discussion further enhanced the knowledge of Elders, youth and leaders about climate change and helped them develop adaptation strategies. The dialogue gave the Dene in Denendeh a summary of the changes climate change will bring to their communities and what they could do to cope with the changes to maintain their lifestyle and culture to the greatest extent possible. The communities expressed an enhanced need to identify research priorities, and to outline possible emergency response plans and other measures to adapt to the negative effects of climate change; climate changes that include, but are not limited to, changes in seasonal cycles, animal behaviour, landscapes, water systems, infrastructure, transportation systems and traditional foods.

## Research Activities

A section of the Annual Report was prepared on climate change and Ecology North gave the presentation for the Dene Nation Annual Assembly. Following the presentation, a special discussion amongst the Elders was done on the same day. The Elder discussion session was conducted almost exclusively in the Dene languages and provided all those in attendance with a traditional knowledge perspective, in addition to some interesting stories about the changing landscape.

## Traditional/Local Knowledge and What Was Learned

Interestingly, the concern of many Elders with the management of health care in the North carried over into the discussion on climate change, as traditional perspectives on the state of the environment consistently equated the impacts of global warming with the health situation in Dene communities. Whether this was the result of an intentional comparison or simply a reflection of the holistic perspective of traditional culture, the observations of Dene Elders clearly linked climate change with the health of the Dene peoples.

Some Elders did not agree with terminology like “climate change” as if it implies that the earth is doing something unnatural. As one community member put it, “the earth is always changing in a natural pattern that is cyclical in nature. Some understood it better when described as ‘global warming’, which is the reality of what northerners need to adapt to”. The Elders also expressed a lot of faith in the younger leadership to pull together and strengthen the Dene Peoples, despite the social problems that combine with global warming to undermine Denendeh communities.



## Next Steps

As the project team reported: “In any particular Dene community, the impact on human health can only be clearly identified and measured over time with systematic monitoring using science and a corresponding consideration of Traditional Knowledge perspectives. The development of effective adaptation measures will require research capacity and effective communications, including engagement, at all levels. It is most important that Elders and community members, especially harvesters, hunters and fishers are engaged in identifying impacts and the development of adaptation measures. The leadership must also be engaged to understand what community members are experiencing and will also deal with all levels of government required to address these climate change issues. The people and leadership must have the specialized researchers, science technicians, and some type of community coordinators to assist them in organizing and carrying through climate change initiatives with the assistance and guidance of Elders”.





## Community Profile

Location: Fort Smith, Northwest Territories

Population: SLFN (340); Fort Smith (2500)

Land Area: 92.79 km<sup>2</sup>

### CONTACT INFORMATION

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# Smith's Landing, Northwest Territories

(2015-16)

### PARTNERS

Aurora Research Institute of Aurora College

### PROJECT INFORMATION

Cassette Islands Vulnerability Assessment

## Community History

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Smith's Landing First Nation (SLFN) is a Treaty 8 First Nation whose traditional territory lies in northeastern Alberta and southeastern Northwest Territories. Members reside primarily in the communities of Fort Smith, NT or Thebacha ("along the rapids" in Dene Sųliné) and Fort Fitzgerald, AB, or Thebattii ("head of the rapids" in Dene Sųliné). These communities lie about 25 km apart from each other along the Slave River, separated by a series of rapids and bordering on Wood Buffalo National Park, Canada's largest national park.

Traditional knowledge experts and land-users in the community had long expressed concerns about environmental changes in the area. The community is largely dependent on the health and abundance of wildlife for food harvesting, nutritional sustenance, cultural identity, land-based practices, spiritual sustenance, and overall wellness. As such, the community identified traditional food security as a priority concern, including the availability of and access to the nutritionally-rich food sources that have sustained their people and way of life for thousands of years.



## Project Summary

The Tthëbayághe Nué Bekahuneka (Cassette Islands Climate Change Project) was developed to bring local knowledge and Indigenous science together with western science to explore the impacts of a changing climate on community health and traditional food security. Connecting SLFN youth with Elders out on the land was an important goal.

A base camp was set up on one of the Islands, and two camps were carried out over the course of the summer, including a 3-day camp in June and a 4-day camp in July. The project team also ran several day trips throughout the summer. During the camps and day trips, observations and oral histories were documented using videos and photos to explore the extent of local climate change impacts. Some western science indicators were also collected in order to monitor changes in vegetation over time.

Community experts taught youth how to observe the land and assess patterns of change from a cultural perspective. In the process, the youth learned about climate change, traditional knowledge, western science, as well as traditional bush skills. There was an in-town component to the data collection, in which youth and Elders surveyed 15 community members about their perspectives on environmental change. There were several workshops throughout the project to provide other important skill-developing opportunities for youth, including interviews with Elders, sharing circles, surveys, observation, videography, data management, water safety, and moose hide tanning. Aurora Research Institute worked with SLFN to develop a transect on one of the islands from which they could monitor changes in vegetation over time. A blueberry monitoring plot was developed on one island, so that the community could observe changes to timing and abundance of the berries every year.

## Traditional/Local Knowledge

The Cassette Islands Climate Change Project provided a unique opportunity to engage Elders and youth in the community. It blended Indigenous and western expertise to foster new connections to the land and culture, and also provided an opportunity to learn about healthy, sustainable lifestyles in a changing environment.

## What Was Learned

The primary benefit of this project was that it supported the development of traditional land-based skills for youth, while offering additional training and tools for the community to monitor their territory. Engaging youth in environmental monitoring was beneficial to the whole community, since the work was grounded in cultural practices; the project utilized local traditional knowledge resources to empower the next generation of land-users and caretakers. The integration of traditional knowledge with western science and digital data collection technology helped to bridge the gap between older and younger generations of the community. The results of this project also re-emphasized the importance of building these skills with youth, so that they could have a strong foundation for adapting to the changes to come.



## Community Profile

Location: Yellowknife, Northwest Territories

Total Population: 464

Combined Land area of Yellowknife is 136.22km

The Dettah and Kakisa area combined is 96.14km

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# Dettah, N'dilo and Kakisa, Northwest Territories

(2015-2016)

### PARTNERS

Canadian Association for Physicians for the Environment (CAPE), Jeremy Flatt, James Young, Dr. James Orbinski, Warren Dodd, Melaine Simba, Berna Martin, Nora Mackenzie, Dr. Courtney Howard, Dr. Katie Kohle, Warren Dodd, Consolo-Wilox, Dr. Caren Rose

### PROJECT INFORMATION

Summer of Smoke

## Community History

Kakisa is located in the South Slave Region of NWT, and it is an extremely small community with a relatively traditional lifestyle. The community has road access but is still fairly isolated with no health services. On June 27, 2014, the community issued a voluntary evacuation order, and only half a dozen people elected to remain in the community as the fire approached to within 100 metres of homes. Kakisa

had previously partnered with Ecology North, and this project built on existing relationships as well.



## Project Summary

The summer of 2014 was an unusual and highly uncomfortable one for many in the Northwest Territories (NWT). A lack of rainfall, linked to climate change, led to a record forest fire year in which 35,000 km<sup>2</sup> of forest was burned. These fires threatened many communities, including Yellowknife, but particularly Kakisa, which saw fire at its doorstep, and underwent a voluntary evacuation. The fires also created large amounts of smoke, which filled most NWT communities throughout the summer. The Air Quality Health Index in Yellowknife frequently exceeded “10” on the 0–10-point scale. There were even two days described as “apocalyptic” by most locals, when smoke darkened the midday skies to the point where streetlights came on, and people needed headlamps to see.

The Summer of Smoke project partnered with four NWT communities (including Yellowknife): Dettah and N'dilo are two communities that are in close proximity to the capital of Yellowknife, and they are governed by the Yellowknife Dene First Nation (YKDFN) band authority. Ecology North enjoys a good working relationship and close ties with YKDFN, as they worked together to develop a climate change adaptation plan in 2011. The threat and vulnerability of Dettah to forest fires was highlighted as an important aspect of that plan.

The Summer of Smoke project was designed to study the impacts from forest fire smoke during the summer of 2014 on both the physical and mental health of northerners and their communities. In order to create a rich, data-supported narrative of the health effects of the Summer of Smoke, the project team made use of a community-based, trans-disciplinary, mixed-methods participatory research strategy. The project comprised both qualitative and quantitative components, and it facilitated the distribution and analysis of community members' stories about the Summer of Smoke, as well as the analysis of health data from the Yellowknife clinics, emergency department, and pharmacies. The project was guided by an EcoHealth approach, which emphasized an understanding of the interdependence of human health with ecosystem health,

community participation at all stages of the research process, and a focus on social equity in project design and execution.

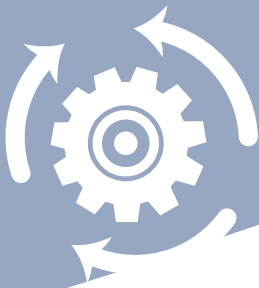
## Capacity Building

Three community coordinators (one from each of Kakisa, Dettah, and N'dilo) were trained in digital storytelling methods, video editing into short autobiographical films, and learned how to train other community members in the use of video cameras. Participants were encouraged to take the cameras to places where they felt most comfortable, to do their own filming. During the training session, community coordinators were encouraged to use strong listening skills and ask questions to interviewees as part of a conversation, rather than as a structured interview. The coordinators successfully achieved an introductory level of competence in camera operation and interviewing techniques.

## Traditional/Local Knowledge

This project incorporated traditional knowledge as the partners played a key role in developing the videos. Roughly half of the video participants were Elders, as they hold key knowledge about how the land is changing and forest fires are becoming more intense and widespread over the past decades, as well as the impact of these changes on traditional ways of life. Participants were gently guided in terms of expected content of the video segments, with traditional knowledge of the changes, and how they are impacting culture, health and their personal journeys being critical components of the project.





## Resources Developed

- Twenty-six short videos from four communities describing their experiences of the summer were developed.
- Four mini-documentary movies were created: three highlighting the Summer of Smoke and how it impacted each community, and one mini-documentary that weaved together footage from participants' autobiographical videos, interviews and images from the project.
- Some of the interviews, which were done in Dene, required translation into an audio format so that the transcriber could complete the transcripts.
- A policy paper, a plain language policy paper, and several academic papers to prestigious academic journals were also completed.

## Communications

The community-based videos were shown at an Ecology North sponsored community gathering in each of the communities (Dettah, Kakisa and Yellowknife), and over 60 people attended. The videos were also presented in Kakisa to the Band council and others to good response. The project team made a number of other presentations or meetings to various people/groups: the Honourable Minister of Environment and Natural Resources, the Chief Public Health Officer, the Deputy Minister of Health and Social Services, and the Northwest Territories Association of Communities Annual Meeting, in which over 100 community delegates were in attendance. There was also considerable media interest in this project. The CBC ran a story on the project in the fall of 2015, which got considerable air time in NWT, Yukon, and as far as BC. There was also interest from the CBC in a follow-up to this project.

## What Was Learned and Next Steps

This project made a significant difference in many ways. Capacity was built in the community to carry out this kind of research, but more importantly, there was a kind of cathartic response among community members: someone was listening to them, and there was an acknowledgement of the stress that this summer put on them. The videos and documentaries really showed that the mental stress and anguish had a large impact on individual people and communities.

In terms of policy, the project team was glad to see that the government departments who were responsible for the response to the forest fire were jolted into action by the Summer of Smoke. Several reports and numerous adaptations were completed that responded to criticism or proactively looked at how the communities could solve problems should a similar season reoccur. Furthermore, the realization that communication and partnership was critical to an effective response seemed to sink in and steps were taken in that direction.

## Community Profile

Location: Yellowknife, Northwest Territories

Population: 1,408

Land Area: 105.44 km<sup>2</sup>



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# N'dilo, Northwest Territories

(2015–16)

### PARTNERS

Chief Edward Sangris, YKDFN; Fred Sangris, YKDFN; Mason Mantla, Community Action Research Team, Tlicho Government; Courtney Howard, MD; Craig Scott, Ecology North; Steve Outlet and Vince Halushka, Arctic Energy Alliance; Aileen Drybones, staff, and students, K'alemi Dene School; Erin Freeland-Ballantyne, Dechinta Centre for Research and Learning; Tom Girrior, Yellowknife Search and Rescue; Susan Chatwood, Institute for Circumpolar Health Research; Jeremy Emerson, Davis Heslep, and Terry Woolf, Western Arctic Moving Pictures

### PROJECT INFORMATION

Climate Change and Our Lands in Film: A Yellowknives Dene First Nation Youth Climate Change Adaptation Plan

## Community History

N'dilo is a First Nations community on Chief Drygeese territory in the North Slave Region of the Northwest Territories. The small Dene community is located on the edge of Yellowknife on the tip of Latham Island and is represented by the Yellowknives Dene First Nation (YDFN). The community experiences similar climate change impacts that are observed in other northern locations; however, much still remains as to the major health consequences related to climate change.

N'dilo residents have the inherent desire and ability not only to survive off the land, but to also thrive from it amidst a changing climate. Resiliency towards current health impacts exists in many forms and is pivotal in determining their strength and future prosperity as northern Indigenous peoples. Resiliency carries with it a medley of benefits and is what the project aspired to create. In consideration of this connection, the project contributed to the growing information exchange networks, and enhanced capacity to effectively respond to climate change in a pan-northern health context.



## Project Summary

The primary objective was for grade nine to grade twelve students to document climate change impacts on health and create a climate change adaptation strategy using the PAR<sup>6</sup> video method during the September 2015 to June 2016 school year. Students documented their strategy by using the PAR video methodology. As a youth-led project, students also received three credits in communications and technology while exploring their knowledge of the changing landscape.

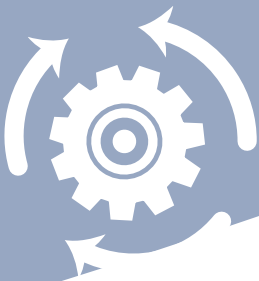
## Research Activities

In the fall of 2015, students were trained in action video research, documentary film production, and climate change literacy. For the last portion of the school year, students conducted eight interviews with local Traditional Knowledge experts, bio-fuel specialists, an ecologist, and an emergency room physician. The information from the interviews was used to form their own climate change adaptation and mitigation plan. Students documented their learning outcomes, the creative process, and an eight-step adaptation and mitigation plan was produced into a 20-minute film.

## Capacity Building

The project was of significant importance to the community because: (1) it allowed students to realize the value of conducting video research while showcasing local youth leadership and talent; (2) it equipped them with an entirely new skill set and increased their employability; (3) it allowed six students to earn credits towards graduation; (4) the project re-instilled the practice of learning from Elders; (5) it fortified their connection to their traditional territory and culture, seen in the fish camp and trap line field trips; (6) the project provided a comprehensive perspective on climate change, climate change impacts on health and wellbeing, adaptation and mitigation, seen in the assignments and interviews; (7) it provided the information needed to take action against climate change, seen in the commitment to eventually use renewable and alternative energy, car pool, and bike; (8) the project prepared students to effectively detect unsafe ice conditions and how to rescue someone that has fallen through the ice; and (9) the project made a difference in terms of enhancing positive working relationships between all of the partner organizations.

<sup>6</sup> For a definition of PAR, please see Kluane, Yukon (2013–14) (page 33).



## Communications

Upon project completion, the students held a public film screening of their documentary. All project partners including YKDFN's Chief Sangris, Arctic Energy Alliance, Ecology North, ICHR, all Kalemi Dene School teachers and KDS Grades 5-12 students had the opportunity to watch the film at Kalemi Dene School. The film was also in the process of being published online in order to reach a wider audience. Moreover, the project lead spoke at two research conferences (University of Alberta and Dartmouth College) about the importance of developing research capacity amongst Indigenous youth in changing northern environments. Student testimonies regarding their learning outcomes were included as evidence that they developed research capacity through this project.

## What Was Learned (Student-led Climate Change Adaptation Plan)

- Traditional Living: We can reduce our greenhouse gas emissions by participating in traditional activities.
- Alternative Transportation Options: We can carpool, take the bus, walk, or use bio-fuel to power our vehicles.
- Just Go Outside: Be physically active! Play sports! The more time we spend outside the less fossil fuels will be used.
- Use Wood Pellet Burners: They are a cleaner option than propane.
- Use Solar Panels: Solar energy is a renewable resource and doesn't emit greenhouse gasses.
- Be Prepared: Always have extra supplies in case you fall through the ice.
- Help Each Other: Help Elders and your family if they become ill from forest fire smoke.
- Take Care of the Land: When we take care of the land, the land takes care of us.





## Community Profile

Location: Cambridge Bay, Kugluktuk, and Ulukhaktok, Nunavut

Population: 1,766

Land Area: 202.35 km<sup>2</sup>

### CONTACT INFORMATION

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# Cambridge Bay, Nunavut

(2015–2016)

### PARTNERS

Canadian High Arctic Research Station, Hamlet of Kugluktuk, Hamlet of Cambridge Bay, Cambridge Bay Wellness Centre, Kitikmeot Inuit Association, Resolution Wellness Centre, Kitikmeot Heritage Society, and Hamlet of Ulukhaktok.

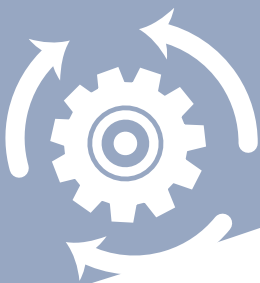
### PROJECT INFORMATION

Inuinnaqtun tiliugait auktuqpalliajut ukiuqtaqtumi: Inuinnaqtun structures for a thawing Arctic

## Community History

Iqaluktuuttiaq, meaning “good fishing place”, is the Inuit name for Cambridge Bay where the Inuit have lived for over 4,000 years. This long timeframe is documented in oral history and in the archeological record, making Cambridge Bay an ideal location for reconstructing traditional knowledge. The history of climate change impacts in Cambridge Bay is also recorded in oral history and in written

documents. During climate change adaptation planning in 2010, community members recounted how hail and thunder storms were previously unusual events, but that they were increasing to at least once per year. Permafrost melting is noticed, as are changes in sea ice. Sea ice melts with the warming climate, and then refreezes with a rougher, less navigable surface. The more treacherous re-frozen terrain



results in part from increased windstorms during freeze-up. Elders and scientists agree that storms occur more suddenly than in the past, and are increasingly hard to predict.

## Project Summary

The project produced drawings, models, and full-size reconstructions of shelters that were traditionally built during various seasons in the Inuinnaqtun speaking communities of Cambridge Bay, Kugluktuk, and Ulukhaktok, through a process that shares and adapts traditional architectural knowledge for active, continued use. First, workshops on tradition-based shelters were held with knowledge holders and young people. The workshops included discussions, drawing, and model-building. Then, reconstructions were undertaken on the land, with an Inuit knowledge-holder leading each event. Students were also invited to participate in the full-scale reconstructions, which included three building types: the summer/ autumn tent, spring *qarmaq*, and winter iglu. A total of 15 people attended the reconstruction workshop, including nine Elder knowledge holders and six younger people from the community ranging in age from 12 to 35 who were interested in participating in the reconstruction. Reconstructions and workshops were videotaped and documented in words and architectural drawings. After the reconstructions, Elders and students discussed the processes and results, and considered the value of the shelters for health and safety, particularly when climate change makes conditions more uncertain. Overall, the workshops and reconstructions were designed to share and adapt traditional architectural knowledge for active, continued use—even as climates and landscapes change.

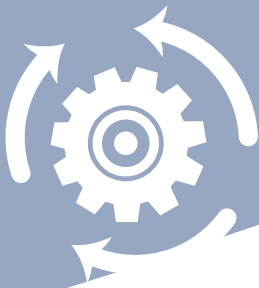
## Traditional/Local Knowledge

This project shared Inuit architectural wisdom among young people and teachers who could continue to share the knowledge with the younger generations. The project aimed to assess young peoples' views of the usefulness of this knowledge and also to inspire them to learn applied scientific skills and mathematical knowledge by working within a genre—iglu building—that was familiar and comfortable for them.

## Resources Developed

All workshops and reconstructions were videotaped by Cambridge Bay native Mark Hadlari. A video was made of the summer dwelling and two documentary films on iglu/ *qarmaq* building and its importance for climate change was also completed. One documentary was in English and the other in spoken Inuktitut. The documentaries explained climate change and the value of Inuit Knowledge.





## What Was Learned

The reconstructions contributed to the understanding and skills of shelter-building. A number of tradition-based skills were re-introduced to people where the skills were becoming increasingly rare. The *qarmaq* was an aspect of traditional architectural knowledge that was not known by many of the knowledge-holders involved in this research. Strategies for ventilation were also important components of the traditional knowledge, since asphyxiation due to inadequately ventilated fires or stoves is a serious health risk for people sleeping in emergency shelters. Clean air strategies were an important part of the architectural documentation accomplished in this project. Through the iglu and *qarmaq* building experience, the community and participants learned about, and documented, passive heating strategies inherent in Inuit knowledge; many of these were applicable to modern Arctic dwellings and can lead to an architecture that is carbon neutral: a way of incrementally mitigating climate change.

## Next Steps

The project team proposed to continue this research into tradition-based structures as a way to renew Inuit Knowledge among young people in Arctic communities, and as an important adaptation to climate change in the north. The research could also be expanded into dwellings that have a low carbon footprint, such as those that use moss for insulation. Other research opportunities could include employing tradition-based structures in mathematics education as a way to teach geometry and calculus in Inuit communities and to encourage young people to pursue the applied sciences.



## Community Profile

Location: Iqaluit, Nunavut

Population: 6,699

Land Area: 52.5 km<sup>2</sup>



### CONTACT INFORMATION

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# Iqaluit, Nunavut

(2015–2016)

### PARTNERS

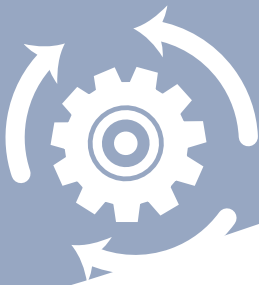
### PROJECT INFORMATION

Implementing a “Design Thinking” Research Process to identify concrete community-based actions to mitigate the effects of climate change on health and wellness in Inuit communities in Nunavut

## Community History and Design Thinking

A changing climate is closely linked to the health of Inuit in Nunavut. The Inuit worldview sees a relationship between [the] environment and health and wellness (Communities of Arctic Bay, Nickels, Furgal, Buell, and Moquin, 2005; Egan, 1998; Watt-Cloutier, 2004), and the Nunavut Climate Change Partnership was formed in 2008 to build capacity for adaptation planning (Boyle, Cunningham,

and Dekens, 2013). The *Upagiatavut* “Setting the Course” report (2013) outlined the impacts of a changing climate on various elements of infrastructure and highlighted general objectives to address some of the issues (including ensuring that climate change considerations are integrated into land-use planning).



Design Thinking is understood, today, as a way of thinking that leads to “transformation, evolution, and innovation” (Tschimmel, 2012). The Human-Centered Design framework (IDEO, 2012) adapts the Design Thinking theory into a toolkit for use in designing, creating, and implementing innovative, intersectoral solutions to pressing health and social problems in developing countries. Its focus on community participation and cultural competency in the design process made it a desirable framework for the project team to use in the Nunavut context of climate change and health adaptation.

## Project Summary

The Qaujigiartiit Health Research Centre received funds to conduct a community-based workshop using principles of Design Thinking to develop climate change adaption actions within and across various sectors at the community level. The workshop took place on March 3–4, 2016, at the Frobisher Inn Hotel in Iqaluit, NU. It was scheduled for two full days, however a blizzard closure on March 4 forced the project team to shorten the second day of the workshop to a half-day. There were 14 participants made up of researchers, artists, youth, and representatives from municipal and territorial governments. There were also attendees from four other Nunavut communities (Qikiqtarjuaq, Baker Lake, Arviat, and Cape Dorset). Despite challenges due to scheduling, weather, and availability of attendees, the workshop was well-attended and well-received.

Three major priority areas and projects identified by participants: 1) development of tools to allow for community-based collection of climate change observations/data; 2) development of land safety course and resources to be delivered through community TV and other media; 3) and the creation of an online platform to better utilize motor vehicles in community to mitigate greenhouse gas emissions.

## Research Activities and Resources Developed

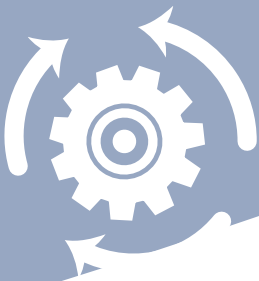
From workshop discussions, participants self-organized around three main projects.

### 1) Mobile Tool for Community-Based Collection of Climate Change Observations/Data

This idea harnessed the power and popularity of mobile devices (phones, tablets, media devices) in communities to allow for community members to record data and observations pertaining to various climate change indicators and community hazards. This allowed the community to create a living database of information to be used for a range of activities, from deciding how safe various trails are, to the risk of travelling on sea ice, to community planning decisions.

### 2) Land Safety Digital Multimedia Resources

The project worked with a local multimedia team to record footage from the training workshops in order to compile a training series which could be distributed online and through community TV channels. The multimedia resources reached more community members who could not participate in the original workshops. With climate change expected to make conditions less predictable and riskier, teaching and passing land safety skills for emergency preparedness on to young people is important. This was highlighted by the community and the Arviat Wellness Centre as a priority. This knowledge transfer also works on strengthening Elder-youth connections and relationships in the community, as it is Elders and experienced hunters who teach these skills.



### 3) Online Community Ride-share Program

A need to address the mitigation of greenhouse gases in Iqaluit was identified in the workshop, and championed by a local artist Pascale Arpin, and a group of high school student participants. Participants noted the large number of vehicles in the community, and the prevalence of single-passenger driving. The group recognized that technology could be leveraged to allow the community to pool its resources and better partake in a sharing economy. Participants identified in their approach that this would not be a revenue generator or replacement taxi service, but rather a better way to manage and organize carpooling in the community, based on goodwill and a shared desire to reduce the number of cars and emissions.

## Capacity Building and Traditional/Local Knowledge

Background information about climate change and impacts on communities was co-delivered with partners from the Nunavut Research Institute and the Government of Nunavut's Climate Change Centre. There was also an opportunity for the Hunters and Trappers Organization in Qikiqtarjuaq to share their Elders' climate change observations with other communities. Moreover, the Human-Centered Design framework that was used is applicable and adaptable to the Nunavut context because its core principles align very well with those of *Inuit Qaujimajatuqangit* (IQ), which are Inuit beliefs, laws, principles and values along with traditional knowledge, skills and attitudes. This project integrated Western and Inuit epistemologies (ways of knowing) and methodologies (ways of doing), and the compatibility of the Human-Centered Design framework with IQ. Additionally, project activities were adapted for geographical and cultural relevance.

## Communications

Prior to conducting the workshop, invitations were widely distributed across the territory, and certain organizations and individuals identified as important to attend were personally invited. Travel funding was available for attendees from outside of Iqaluit. Invitees were also engaged prior to the workshop in order to gather information about their own thoughts on climate change challenges in their community, and this information was compiled for presentation at the workshop.

## What Was Learned and Next Steps

Overall, the design workshop was seen as a success by the participants. They identified the importance of a co-creation methodology to solutions development, and its absence in the usual state of affairs. Participants were pushed to think creatively, and bring their knowledge and experience not just as working professionals, but to also draw on other aspects of their lives. The impacts of climate change are being felt by northern communities and are projected to grow in the future. This fact makes it that much more important to meaningfully engage with communities to develop and co-create the solutions to address them. There is potential for this approach to be applied to future projects and designing of solutions for other climate change and non-climate change applications.



## Community Profile

Location: Nunatsiavut, Newfoundland and Labrador

Nunatsiavut Population: 2,500

Land Area: 72,520 km<sup>2</sup>

### CONTACT INFORMATION

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# Rigolet, Nunatsiavut

(2015-16)

### PARTENAIRES

Jack Shiwak, Rigolet Inuit Community Government; Inez Shiwak; Michele Wood, Department of Health and Social Development; Ashlee Cunsolo Willox, Cape Breton University; Sherilee Harper, University of Guelph

### INFORMATIONS SUR LE PROJET

Building Foundations for a Community-Led Environment-Health Monitoring System

## Community History

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Nunatsiavut, "Our Beautiful Land" was established in 2005 from the Labrador Inuit Land Claims Agreement. There are five Inuit communities in Nunatsiavut (South to North): Rigolet, Makkovik, Postville, Hopedale, and Nain.

The Canadian Arctic is experiencing often-intense socio-cultural stresses as a result of climate change, resource extraction, and associated shifts in environment, flora, and fauna. These changes present major challenges to the social determinants of health, with the most acute impacts felt among Inuit populations reliant on the environment for sustenance and livelihoods. Globally,

improved environmental health monitoring has been identified as a critical adaptation strategy to respond to impacts on health. There is a repeated call for the creation of health monitoring that uses novel approaches, integrates new types of data, and includes multiple knowledge sources. This is important for Indigenous communities, who often are inadequately engaged in health monitoring systems, leading to major gaps in participation, relevance, and data quality.



## Project Summary

Following community-based and community-led participatory methods, the research goal was to design, pilot, and evaluate a community-based health monitoring and response strategy. Bringing together Indigenous and scientific knowledge to decrease the health impacts of climate change, the project has the potential to be scaled up regionally and/or transferred to other northern regions.

Data was gathered by Rigolet community members through an interactive app that was collaboratively developed with the community for this project, and is usable on electronic devices. Data could be accessed by health professionals and governments at the local and regional levels to support community health decision-making. There was also the option to make some information available to community members through online platforms. Through past research, the project team understood how and why their community is vulnerable to climate-health impacts, and this project was developed to take action and respond to these vulnerabilities.

## Research Activities and Capacity Building

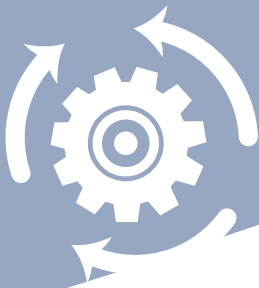
- Identified indicators for climate-health monitoring to establish a baseline set of community-identified data to support the monitoring system;
- Developed innovative methods to capture and integrate weather, environmental, and health data, with an emphasis on integrating Indigenous and scientific knowledge;

- Continued to develop and enhance climate-health research skills and capacities that enhance adaptive capacities and resilience by training community members acting as local researchers in the following: project management, design, and delivery; conducting in-depth interviews, surveys, focus groups, and evaluations; results-sharing, public speaking, conference presentations, and communications;
- Worked with the Nunatsiavut Government to develop and implement a Nunatsiavut Census, built on the platform of our monitoring work; and
- Connected with other Inuit and Indigenous communities.

## Resources Developed and Communications

- 14 in-depth, semi-structured, conversational interviews were conducted with key stakeholders in Labrador; and 14 in-depth, semi-structured, conversational interviews were conducted in Rigolet, Nunatsiavut.
- 1 invited peer-reviewed book chapter was completed for *The Handbook of Indigenous Wellbeing* (expected publication date, July 2018), co-written with community governments and program participants.
- 2 peer-reviewed journal articles were co-written with community governments and program participants in Nunatsiavut in process.





- 6 oral conference presentations and 1 poster presentation was completed.
- 3 News Media pieces were published in *Canadian Geographic*, *Up Here Magazine*, and *The Labradorian*.

## What Was Learned

- Community engagement: the community responded very well to providing feedback on the app development, and had clear ideas and suggestions about how they wanted to use the app.
- Partnerships can improve scalability of the project: ongoing discussions and coordination with regional government officials led to the expansion of the project's scope.
- Data sharing agreements were important, but challenging: formulating a data sharing agreement between academic institutions, regional government, and municipal government organizations is an ongoing challenge for any project such as this, and was a main discussion point for all of the work.
- Unique technology challenges in the North: creating an app that would require uploading information to the internet in a remote community with low bandwidth was a challenge. Similarly, planning to use this technology in the cold, where battery life is limited and where touch screen compatible gloves were necessary, was another challenge that had to be planned for. The project team continued to troubleshoot these challenges and worked on piloting different technologies.

## Next Steps

The development of the eNuk app was an iterative process that resulted in ongoing improvements to the app. As the team continues to receive regular feedback on the eNuk app from users (collected during monthly meetings with participants), the features and design of the app are expected to change and improve in order to better suit the needs of the community. Furthermore, the project continued to collaborate with the Nunatsiavut Government. Adapting the eNuk app for a census in all five of the Nunatsiavut communities could allow the Nunatsiavut government to collect regionally specific statistics, allowing them a better sense of specific health needs of their community that go beyond the work done by Statistics Canada; this collaboration was ongoing upon project completion, with the ultimate goal to conduct a census using the eNuk app platform in the third year (2018) of this project.



# Education

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“[Universal] education is key to enhanced climate adaptation” (Lutz, Muttarak, & Striessnig, 2014).

Sharing knowledge between and within generations is a valuable societal practice that brings context to experiences and helps individuals and communities make informed decisions. Whether it is passed on through story, books, video, arts, music, etc. The purpose is to educate, create awareness, and promote meaningful knowledge.

The leaders of today and tomorrow need to have access to a wide array of knowledge and experience to make informed decisions on how to adapt to environmental change. Through community-led projects, communities are building capacity by engaging current and future leaders in the scientific process and by organizing on-the-land camps where youth learn Traditional Ecological Knowledge (TEK).

Sheila Watt-Cloutier, acclaimed Inuk climate change advocate and Nobel Prize nominee, considers being out on the land an intimate learning experience where “(t)he actual act of going out on the land, and the skills that are required to survive these conditions that we have in the Arctic, are the very skills ... young people need to survive even in the modern world. What the land teaches you ... is to be bold under pressure, to withstand stress, to be courageous, to be patient, to have sound judgment, and ultimately wisdom” (Watt-Cloutier, 2005).

Northern First Nations and Inuit communities made it clear that sharing knowledge, specifically traditional knowledge, is important to them. Seven of the projects focused on education; however, every project included an education component, as it is a foundation of the CCHAP to provide community capacity building. The eight education projects tell stories of how communities put forth plans to educate northern First Nations, Inuit, and researchers on the health impacts of climate change and adaptation. A strong emphasis was put on sharing traditional knowledge between youth and Elders through their participation in interviews, on-the-land camps, films, and photography activities.

## Community Profile

Location: Yellowknife, Northwest Territories

YKDFN Population: 1,200

Land Area: 105.44 km<sup>2</sup>



### CONTACT INFORMATION

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# Dettah, Northwest Territories

(2012–13)

### PARTNERS

Susan Chatwood, ICHR; Kyla Kakfwi, Daniel T'seleie, Gordon Foundation Fellows; YKDFN Youth and Elders; Dawn Tremblay, Ecology North; High Schools in YK; Sarah French, Gordon Foundation / Munk

School of Global Affairs; Jennifer Drygeese, Elder Muriel Betsina, Bobby Drygeese, Yellowknives Dene First Nation; Elder Bertha Jaeb, Tlicho First Nation; Frozen Eyes Photography Club

### PROJECT INFORMATION

Climate Change and Emergency Measures: Traditional Knowledge Research for Increased Unpredictable Severe Weather and Travel Safety impact on Community Health, Tools for Development of Adaptation Plans

## 98 Community History

Inuvialuit, Kitikmeot Inuit, and Dene from all five regions of Denendeh live in Yellowknife. With over 22% of the city's population, Yellowknife's Indigenous population alone makes it the largest Indigenous community in the Northwest Territories. Although most Indigenous peoples living in Yellowknife have very strong ties with their communities all over the Arctic, Yellowknives Dene First Nation (YKDFN) has become a home away from home.

Indigenous peoples and northerners are being dramatically impacted by climate change. Increasingly unpredictable weather events impact the ability of people to travel safely—not only in traditional ways—but also through modern means of transportation such as airplanes. 2011 was a traumatic year for many northern communities with the First Air crash in Resolute Bay caused by unpredictable weather, the Arctic Sunwest crash in Yellowknife's Oldtown caused by severe wind in the channel, and Air Tindi crash outside of Łutsel'ke caused by rapid shifts in fog conditions. Fifteen people were killed, impacting communities across



the North. In a majority of northern communities, emergency help is many hours away by airplane, and for the most part, there is no first responder program or even an emergency nurse available.

## Project Summary

The incidents highlighted the desperate need in all the communities for the knowledge and tools necessary to address emergency scenarios and adaptation plans. This project was community-led, ensuring that northern voices shaped all the planning and research surrounding this topic. The project was also an opportunity to promote youth research skills. Seven high school student researchers explored the issues of climate change, adaptation and emergency preparedness from both a western science and traditional knowledge perspective. This was accomplished through a series of expert lectures from science, traditional knowledge and policy experts and through experiential opportunities at a Traditional Knowledge bush camp near Dettah, NWT.

## Capacity Building and Traditional/Local Knowledge

Using community-based research methods and digital film as data collection tools, students aimed to identify key lessons about the impacts of climate change on traditional lifestyles and travel in the North. As part of their investigations, students looked at the health dangers and risks, and how they had impacted the community. Through reflection on guest lectures, class discussions, and personal interviews, students identified actions to prevent and/or effectively respond to safety concerns that arose from unpredictable weather patterns caused by climate change. Key themes and lessons emerging from interviews formed the basis of a short documentary film, created by the students with mentorship from local northern filmmakers.

## What Was Learned

Recruitment of student researchers was hampered by the fact that most young people were in class during the day. A better fit would have been integrating this project model into a classroom setting and building the research into the student's assignments. This model was proposed to be explored in the future.

Additionally, emergency preparedness and climate change can be difficult topics to engage with youth on. In order to capture their interest and encourage their learning and exploration of its relevance to “real life”, it was helpful to have an engaging medium like film as part of the learning process. Making films is a very popular activity in the NWT and attracting youth to a research project that makes use of this technology is much easier as a result of this. There were also excellent local filmmakers in the NWT who could act as resources. The Institute of Circumpolar Health Research continues to support youth research initiatives with a film-based research component.

## Next Steps

This youth project built on an ArcticNet-supported youth photovoice project that was conducted in Inuvik last year. Student delegates presented their preliminary findings at the Monk School of Global Affairs and Walter and Duncan Gordon Foundation's joint conference on Arctic Security in Toronto. In the long term, the research skills developed by the Elders and youth will contribute greatly to future projects related to Climate Change and Health impacts on Arctic (north of 60) communities. The networking and community capacity building with northern youth and Gordon Foundation fellows will be invaluable for future generations.

## Community Profile

Location: Inuvialuit Settlement Region

Population: 5,767

Land Area: 90,650 km<sup>2</sup>

### CONTACT INFORMATION

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# Inuvialuit Settlement Region

(2012-13)

### PARTNERS

Aurora College: Doug Robertson, Anne Church, Marja Van Nuyenheyzein, and Tara Gilmore; and the Department of Education, Culture and Employment of the Northwest Territories: Janine Blake; and all Inuvialuit Community Corporations and Hunters and Trappers Committee's

### PROJECT INFORMATION

Inuvialuit Capacity Building and Training Year

## Community History

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The Inuvialuit Settlement Region (ISR) is located in Canada's western Arctic and encompasses six communities including the Town of Inuvik and the Hamlets of Aklavik, Paulatuk, Sachs Harbour, Tuktoyaktuk and Ulukhaktok. The ISR is located mostly above the tree line, but includes three sub-regions: the Beaufort Sea, the Mackenzie River Delta, and the Yukon North Slope, which comprise Crown Lands and Inuvialuit Private Lands. The ISR is one of the four Inuit regions in Canada represented by Inuit Tapiriit Kanatami (ITK). Outsiders have historically been the researchers who study Inuvialuit people and other Indigenous cultures

around the world. However, it is more common today to see an Indigenous person training and building capacity in their communities due to the Ownership, Control, Access and Possession (OCAP) Principles; because of this, the project team aimed to shift community thinking to empower communities to realize that they have the choice to be involved in research and to determine if they want to lead research. As one project lead put it: "we want our communities to know that they are and can be the owners of knowledge, whether it is traditional knowledge or science".



## Project Summary

This project was a community-led initiative facilitated by the Inuvialuit Regional Corporation (IRC). The purpose was to provide training and capacity-building courses or programs that would benefit various people in the six Inuvialuit communities either in existing organizations such as Hunters and Trappers Committees and Community Corporations or those individuals who were interested in acquiring training that would enable them to take the lead in research and project management. The training offered could also directly help individuals to enrol in scheduled Continuing Education Courses offered at Aurora College. In addition, the project hired Aurora College instructors to visit communities so that a larger number of people could be trained at one time. In coming years, the project team hoped to increase the number of trained Inuvialuit in the region so that they could be ready to take on future development and challenges brought about by climate change and global warming.

## Research Activities

- A tour of the communities within the ISR was undertaken in order to determine the training needs for Inuvialuit while also informing them of Inuit Research Advisor (IRA) duties and projects.
- The IRA consulted internally about education rates and training needs through current IRC education research. Planning meetings also occurred with Aurora College and Education, Culture and Employment (ECE).
- Inuvialuit in all communities identified First Aid + CPR and Firearms Acquisition Certificates (FAC) as their top needed training, as it would be used to gain potential employment through research or to maintain their certificates to keep or attain current employment opportunities.
- Courses were completed in all six communities in the ISR. Coastal communities completed both CPR and

FAC, whereas the Delta communities were only able to receive CPR.

- A final report was published following all the training and related project activities.

## Capacity Building

As a result of the partnership between IRC, Aurora College and ECE, 54 people were able to become certified in St. John's Ambulance CPR + First Aid or FAC in Paulatuk, Ulukhaktok and Sachs Harbour; and 28 people in Inuvik, Aklavik and Tuktoyaktuk were certified in St. John's Ambulance First Aid and CPR.

## What Was Learned and Next Steps

This project has proven that regional training initiatives do work, and through partnerships it is possible to increase capacity in northern communities. Community members in particular were very happy that the instructors were coming to the communities to deliver the courses, so that they didn't have to leave their community to get the training they needed. For the coming years, the project team hoped to build on the baseline of training achieved, in order to offer specialized courses like Small Vessel Licence, Wilderness First Aid, Proposal Writing and other courses that would align with what job opportunities are available in the ISR through industry, research and summer work that involves marine and terrestrial aspects. Once Inuvialuit people are trained in specialized fields, they will be capable of undertaking and submitting project proposals to research funding agencies to undertake community-based research that links to health and climate change. As projects go now, only certain communities in the region have the capacity needed to undertake this work. Therefore, there is a need for region-wide training to get more communities involved.



## Community Profile

Location: Inuvik, Northwest Territories

Population: 3,463

Land Area: 62.48 km<sup>2</sup>



### CONTACT INFORMATION

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# Inuvik, Inuvialuit Settlement Region

(2012-13)

### PARTNERS

Douglas Esagok-Joe (former President Inuvik HTC), Lisa Rogers (Resource Person Inuvik HTC), Shannon O'Hara (Inuit Research Advisor-Inuvialuit Regional Corporation), Kate Snow (Project Coordinator-Fisheries and Oceans Canada and Inuvik HTC), and Lisa Loseto (Researcher-Fisheries and Oceans Canada); Chris Harrison/Joint Secretariat/IRC (camera, GPS, website creation), Daniel Slavik/WWF-Canada (Hi-Def Camera, training), Joel McAlister/Aurora College ENRT Program; Oceans North Canada and Inuvialuit Regional Corporation (Self-Government); Inuvialuit Regional Corporation;

Twisted Ladle Catering; Joint Secretariat, WWF-Canada; Lawrence Rogers, Kate Snow, and Shannon O'Hara

### PROJECT INFORMATION

The link between climate change and health in the Inuvialuit Settlement Region (ISR): Capacity building, traditional knowledge exchange and community-based monitoring for elders and youth at Kendall Island, NWT

## 102 Community History

Inuvik is a town in the Inuvialuit Settlement Region (ISR) in the Northwest Territories. Many Inuvialuit continue to lead a traditional lifestyle on the land and sea with cabins throughout the Delta, Mackenzie Estuary and along the coastline. The community and culture are vulnerable to climate change as it is in a northern location. There have already been noticeable impacts throughout the region and ecosystem, such as rapid erosion along the riverbanks and coastlines, changes in weather, and ice break-up.

For many years, Inuvialuit people and researchers have been making observations of climate change that may be affecting the health of beluga whales and fish at traditional Inuvialuit whaling camps around the ISR. These observations were very important to document and act upon, as the local people in the ISR depend on the land and sea for food. It was also important to study Kendall Island and other surrounding islands, as they have been occupied for many decades by Inuvialuit families and therefore it



was pertinent to understand the history of the area while also examining it scientifically in terms of beluga and fish abundance.

## Project Summary

The duration of the pilot monitoring program was very short but successful. The purpose of the project was to address the community concern regarding the health of beluga whales and fish in the area while also looking at how climate change may be impacting them, which directly and indirectly impacts the livelihood of the Inuvialuit people. This project collected Traditional Knowledge through documented video or audio interviews from experienced Inuvialuit beluga whale and fish harvesters. The project activities informed adaptation strategies regarding food security, and the hunter/community knowledge provided feedback on the beluga and research monitoring program at Kendall Island and other beluga camps.

## Research Activities and Resources Developed

- 2-day pre-trip planning and training workshop held at the Aurora Research Institute in Inuvik.
- 4-day field camp took place beginning in the Mackenzie Delta in Inuvik along to the Beaufort Sea coast at Kendall Island, Baby Island, and Sanmiqaaq (Lillian's camp).
- A total of eight interviews were conducted over the course of the project.

- A Knowledge Sharing Workshop was held in Inuvik at the Midnight Sun Recreation Complex. The workshop was hosted by Inuvialuit Regional Corporation and Inuvik Hunters and Trappers Committee.
- Post-field trip phase: verifying interviews, development of a midyear report, preparing for another workshop, and delivering results to the community.
- A short 30-minute video featuring the knowledge sharing workshop, photos and experiences from the field camp is still in the works and is not expected to be available until possibly next year.

## Capacity Building

Workshops included training in the following areas: GPS and SPOT devices, mapping and making alternative plans for routes, electronic equipment usage (video camera, voice recorders, etc.), and sampling procedures. In addition, the field camp allowed youth and Elders to work together, learning how to set up a traditional camp, including: preparing the outhouses, setting up canvas tents (cook house and sleeping quarters), picking a water source and checking for wildlife. In setting up, the team was faced with a real-life challenge of climate change when it was observed that Lillian camp, which is situated on the slope of a hill, was very slanted with the ground underneath giving way from the summer melt. Therefore, some of the youth and a couple of Elders showed Inuvialuit adaptation strategies and proceeded to plank/raise and move the camp up so that it was more level and secure for Lillian.



## What Was Learned

Re-occurring themes from interviews were verified and transcribed. These included:

- Only take what you need and share what you have.
- Whale hunting locations are worth protecting and preserving.
- Summer whale camps are instrumental in enriching culture and the native language, Inuvialuktun.
- Traditional ways of living bring family closer together.
- Technology is beneficial, and helps during the whale hunt
- Until it is said that the beluga or fish are not safe to eat, hunting and harvesting for consumption will continue.
- To adapt to climate change, the community must continue to search diligently for solutions.
- It's important to pass down traditional knowledge for the "togetherness" of the Inuvialuit.

## Next Steps

The project led to the following recommendations for policy and future monitoring programs:

- More community freezer programs in the ISR.
- Inuvialuit families that harvest whale and fish at Kendall Island wanted to see more research done to ensure that the food is safe to eat.
- Research must be led by the community, and Elders and youth should work together.
- Traditional knowledge must be incorporated to get a more accurate understanding of all the impacts of climate change.
- More funding is needed so that the camps and community-based monitoring programs could continue and could also be beneficial for more people.
- Monitors needed to have longer term positions.



## Community Profile

Location: Inuvialuit Settlement Region,  
Northwest Territories

Population: 400

Land Area: 124.45 km<sup>2</sup>

### CONTACT INFORMATION

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# Ulukhaktok, Inuvialuit Settlement Region

(2013-14)  
(2014-15)

### PARTNERS

Olokhaktomuit Hunters and Trappers Committee, Helen Kalvak Elihakvik, Hamlet of Ulukhaktok Recreation Department, Ulukhaktok Elders Committee, Ulukhaktok Youth Council, Ulukhaktok Art Centre, Ulukhaktok District Education Authority, Inuvialuit Cultural Resource Centre, Dr. Tristan Pearce, University of the Sunshine Coast Sustainability Research Centre, University of Guelph Department of Geography, McGill University Climate Change Adaptation Research Group

"To go out on the land or on the ice, that is, it's a very healing process. Just going out. Even to sew, to get your mind and yourself busy at doing something productive, positive. Those are just wellness in itself. To feel proud of something you accomplished."

"My favourite part was listening to the Elders' stories and watching them reminisce about when they were growing up and living the life that they lived and seeing through their eyes how it used to be long ago."

### PROJECT INFORMATION

Phase I: Nunamin Illihakvia Learning from the Land

Phase II: TUMIVUT: tracks of our ancestors towards a healthy future

## Community History

Ulukhaktok, formerly Holman, is a coastal Inuit community located on the west coast of Victoria Island in the Inuvialuit Settlement Region (ISR), Northwest Territories (NWT). Ulukhaktok has a growing youth

population with 49% of residents under 25 years old. Prior to moving into the settlement, Inuit families lived on the land and followed seasonal hunting patterns. Hunting, sharing and consuming country foods are important to Inuit in Ulukhaktok, and are fundamental to culture, identity, and well-being. Participation in subsistence is also about gaining



respect in the community by providing vital, tangible benefits such as spending time with family members, fulfillment, status, and self-esteem.

## Project Summary

The program aimed to support the transmission of Inuit Traditional Knowledge, skill sets and values that are important for a healthy lifestyle, physically, mentally and culturally. Specifically, this program brought together young Inuit with experienced hunters and sewers, and Elders to learn how to travel and hunt during shoulder seasons and how to prepare and sew with caribou skins. The Inuinnaqtun language was promoted throughout the program including an Inuinnaqtun radio show and language videos. Having such knowledge and skills provided young Inuit with the opportunity to engage in productive activities that continue to have value economically and socially. The program sought to share knowledge of caribou hunting, traditional sewing skills, and language to strengthen health and food security during a time of rapid climatic and societal change.

- Involved seven younger-generation Inuit in butchering and sharing seal meat in the community following traditional food sharing networks. The youth were also research and media production assistants who documented program activities.
- Taught traditional seal skin preparation and sewing skills.
- Promoted the Inuinnaqtun language through a community radio program and videos.
- Conducted 32 Inuit-led interviews with Elders, hunters and sewers about the health-related aspects of seals and their importance in Inuit diet and culture in the context of climate change.
- Developed multimedia research and learning tools that promoted Inuit knowledge and skills related to the project activities and their importance to Inuit health.

## Research Activities and Capacity Building

The project:

- Facilitated the transfer of knowledge and skills among 60+ participants (experienced hunters, Elders and younger generation Inuit) on how to make seal hunting equipment, how to travel on the sea ice under changing climatic conditions, and how to hunt seals in the winter.

## Traditional/Local Knowledge

As traditional modes of knowledge transmission for winter hunting and related activities come under stress, the *Nunamin Illihakvia* project responded to a pressing need in the community to establish an Inuit-led cultural education program to promote their culture and traditions among younger generation community members while the Elders were still with them. Traditionally, Inuit knowledge and land skills were transmitted from older to younger generations through on-the-land education or hands-on, practical engagement with the environment. In traditional Inuit education, learning and living were the same things.



## Phase I Resources Developed and Communications

- Six equipment projects were completed: harpoon, ice chisel, snow knife, butchering knife, open water boat and paddles, and sleds.
- Four sewing projects were completed: seal skin hat, *kihimagok* shoes (water-proof shoes made from bearded seal), *puhitaq* (sunburst for a parka), and sealskin parkas.
- Two community feasts were hosted, and an Inuit Day sharing celebration.
- 25 semi-structured interviews (5 pilot and 20 evaluation interviews) were conducted with a sample of program participants in September 2013 and March 2014.
- The aim of the evaluation interviews was to document feedback from participants on their experiences in *Nunamin Illihakvia*, including what benefits the program had and what improvements could be made.
- An Inuinnaqtun language radio show was hosted by youth once per week.
- Two videos about the project were produced (a promotional video and a short documentary).
- A photo book that tells the story of the project through images was created.
- Media interviews about the project were conducted with *CBC News North*, and *CBC Northbeat*.
- Community representatives and researchers presented on the program at the International Congress of Arctic Social Sciences (March 2014), and researcher partners presented at ArcticNet (December 2013).

## Phase II Resources Developed and Communications

- 40+ participants took part in six mapping-place name evenings where Elders, adults and youth shared knowledge of traditional place names, trails, hunting areas, hazards on the land, and stories. One master set of maps identifying hunting grounds on Victoria Island was created, 17 sets of maps were given to participants.
- Numerous stories digitized and uploaded to the *Nauvikhaq* oral history database.
- 12 semi-structured interviews were conducted with a sample of program participants in March 2015. The interviews documented participant feedback on their experiences with the *Tumivut* program.
- Tuhungnarvik Radio Show: Elder-youth hosted Inuinnaqtun radio show every Friday afternoon.

11 beginner-level "Learn Inuinnaqtun" videos. <https://www.youtube.com/channel/UCuk7fyoPM179M-unwQSF63Q>

Community representatives and researchers presented at "Bright Spot" NWT Recreation and Parks Association Conference (Yellowknife, October 2014) and set to present program at ArcticNet Annual Scientific Meeting, December 2015





## What Was Learned

Many respondents said the program benefited everyone involved, including participants who gained skills, Elders who were proud and happy to see knowledge passed on, coordinators who gained employment, children who received new winter clothing, and community members who weren't participants but who attended classes simply to visit and enjoy the atmosphere. Others also suggested the program particularly benefited those who did not have immediate family members who could teach them, such as younger men who did not have fathers or uncles to take them out; single mothers with young children who lack the time to go sit with relatives and learn and benefited from the structure of a program, or who want to teach their children skills for hunting that they were never taught; and people who lacked equipment or could not afford materials to pursue such projects on their own. Other benefits to the program included:

- A sense of pride and capability in oneself, especially by being recognized by Elders and other community members for new skills.
- New friends, increased sense of social support, and intergenerational contact and new relationships with Elders/instructors.
- A sense of well-being, reduced stress and reduced "winter blues" during 24-hour darkness.
- A sense of strengthened cultural identity (Inuk pride).
- A sense of collective healing from factors that have compromised knowledge transmission, including residential schooling and the rapid collapse of the sealskin market.

- Cultural revitalization and language revitalization, among the skills listed in activities.
- Youth learning patience, working through difficulties and frustrations, gaining a mindset to think multiple steps ahead in sewing or making equipment, and developing mental toughness required to hunt in winter conditions.

## Next Steps

In the long term, the project team hoped to develop *Nunamin Illihakvia* and *Tumivut* as an Inuit-led cultural school to help document and promote Inuit traditional knowledge, skills and values that are important for a healthy lifestyle, physically, mentally, and culturally in a time of rapid climate and societal change.

## Community Profile

Location: Łutsel K'e, Northwest Territories

Population: 300

Land Area: 43.18 km<sup>2</sup>



### CONTACT INFORMATION

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# Łutsel K'e Dene, Northwest Territories

(2014–15)

### PARTNERS

Łutsel K'e Elders Society Members, Łutsel K'e Dene School Principal,  
Dawn Tremblay – Ecology North, Becky Broderick – Health and  
Wellness Consultant

### PROJECT INFORMATION

Learning from the Changes: Climate, Land, and People

## Community History

The Łutsel K'e Dene First Nation is an isolated, fly-in only community on the East Arm of Great Slave Lake, Northwest Territories. Łutsel K'e is also part of six communities that make up the Akaitcho Dene First Nations. Cost of living is high, and as such, the band members of Łutsel K'e have relied on the knowledge passed on to them by their ancestors, their skill on the land, and their ability to harvest traditional foods in order to provide for their families. Members of every household still travel for long stretches

of time on the land, and the traditions of the past are still present today. It was this connection with the land that led to various observations of climate change. However, more importantly was the growing awareness of the necessity to better understand climate change.

Following traditional Dene protocol for information gathering, a meeting was held with the Elders to discuss the topic of climate change. Two points were most prevalent:



there had been significant observed changes within the territory, from the location of berry patches and health of the caribou, to water levels, ice conditions and the consistency of snow; and in addition, there was a general lack of knowledge on the topic among youth and Elders alike. This caused concern regarding the community's ability to adapt to climate change and maintain their spiritual, emotional and physical connections to the land. The knowledge generated from this meeting discussion informed the development of the project.

## Project Summary

The purpose of this project was to bring together Elders, youth and adults in the community to discuss the local and pragmatic impacts of climate change on the Łutsel K'e Dene people. The project was designed with four goals in mind: 1) climate change education and awareness; 2) knowledge transfer between Elders and youth; 3) spiritual and emotional healing on the land; and 4) the development of a baseline for health adaptation in the community (a health and wellness plan).

## Research Activities, Capacity Building and Traditional/Local Knowledge

Two workshops were held during a land camp from August 25 to August 30, 2014. This land camp was attended by approximately 40 people—including 15 Elders, and 12 youth—from the Łutsel K'e Dene First Nation. Participants learned about the global issue of climate change from a local and more comprehensible scale, to understand the changes in the context of emotional, spiritual, physical health, mental health and wellness. During the workshop, a consultant from Ecology North provided training on the basic concepts related to climate change. This was well-received, and participants stated that they had an improved understanding of climate change and its effects after the workshop. Despite changing environmental conditions, participants discussed local observations and solutions to maintaining traditional lifestyles. By bringing community members to a place where they felt comfortable, at ease, and connected to the land, the project facilitated knowledge transfer between experts of all fields. Guided discussions and free-flowing discussion techniques were used.



## Resources Developed and Communications

Following the project, a final report was created, and a video was to be entered into the community's Traditional Knowledge Archives, shown to the public in Łutsel K'e, and used as an educational tool for the school. Both resources were to be used as a baseline for climate change information within the community, thereby contributing to the community health and wellness plan. Since the two workshops could not include everyone, project outcomes were further disseminated at community movie nights, school workshops and health and wellness meetings.

## What Was Learned

- Participants stated that they had an improved understanding of climate change and its effects after the workshop.
- Elders related oral accounts of land conditions in the past and youth were able to discern differences between current conditions and those described by the Elders.
- Spiritual and emotional healing on the land was achieved through traditional practices and ceremonies.
- Participation at the workshops was weather-dependent, and participation was markedly lower during rain. It was recommended that future workshops should account for weather-related disruptions and plan accordingly.
- Further discussion is seen as having value for participants; provisions for a follow-up workshop suggested in the future.
- The decision to hold the workshop out on the land was appreciated by the community and was recommended for future workshops.



## Community Profile

Location: Iqaluit, Nunavut

Nunavut Population: 35,944

Nunavut Land Area: 1,877,787 km<sup>2</sup>

### CONTACT INFORMATION

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# Iqaluit, Nunavut

(2014-15)

### PARTNERS

Nunavut Dept. of Environment, Nunavut Tunngavik Inc., Nunavut Research Institute, Government of Nunavut Climate Change Centre, Nunavut Dept. of Health

### PROJECT INFORMATION

A mixed method study to explore human health indicators and youth perspectives on climate change and adaptation in Nunavut

## Community History

Of the approximately 150,000 Inuit living in the Circumpolar region today, 45,000 live in Canada's North. Inuit lands are referred to as Inuit Nunangat, and encompass four regionally distinct areas: Nunavut, Nunavik (northern Quebec), Inuvialuit Settlement Region (northern NWT), and Nunatsiavut (northern Labrador). Nunavut occupies the largest geographical area of all the Inuit Nunangat and

became Canada's third territory in 1999 under the Nunavut Land Claims Agreement. Inuit have had a respectful relationship with the land for millennia, and all communities in Nunavut maintain that relationship today by continuing harvesting practices, camping and living on the land, and by promoting collaborative environmental stewardship. By dramatically changing the environment, the Inuit way of life



is compromised. A changing climate is also closely linked to the health of Inuit in Nunavut.

## Project Summary

A two-pronged mixed method study was done to gather youth perspectives on climate change and health, and to explore circumpolar human health indicators.

PROJECT A: Qaujigiartiit Health Research Centre (QHRC) conducted three Youth photovoice workshops with three youth from Hall Beach, Arctic Bay, and Pond Inlet. Workshops were held in Iqaluit and Baker Lake, NU. The youth photovoice project aimed to explore the research question “What do Nunavut youth perceive to be the most pressing health and wellness issues related to climate change? What do youth perceive to be the role of language, knowledge transfer, and Inuit culture in adaptations to climate change?” Workshop components included the exploration of research basics and the science behind climate change, learning about current research being done in Nunavut, and training on conducting photovoice. Guest speakers were invited from the Nunavut Research Institute, The Government of Nunavut Climate Change Centre, the Inuit Research Advisor from Nunavut Tunngavik Inc., and workshops ensured contribution from an Elder. The presentations prompted good discussion between the youth participants and guest speakers, and they prepared the youth for their photovoice projects. QHRC also partnered with Inuksuk High School in Iqaluit and the Community Centre in Baker Lake to deliver the photovoice project to more students in the communities.

PROJECT B: A health workshop was held to investigate the human health indicators of climate change on a global scale, with a focus on the indicators relevant to the Circumpolar region and Nunavut communities. Participants at the workshop included representatives from community, territorial and regional representatives. The results from the health indicators workshop were compiled in to a report entitled “Exploring Health-Related Indicators of Climate Change in Nunavut”. The top five indicators in order of importance that were identified at the workshop were: 1) Food security vulnerability, 2) Culture loss vulnerability, 3) Number of cities/municipalities participating in climate change initiatives, 4) Permafrost (distribution/shift), and 5) Mental health – rates of depression/anxiety related to climate change.

## Capacity Building

Photovoice participants were provided with a camera and prompted with the research question to explore youth perspectives of impacts of climate change on health, community, culture and language. There were three steps: the initial research training in photovoice, a fieldwork component (taking photos in the community), and a final results workshop. This process allowed youth to be the researchers; they took photos of their surroundings in their community to capture their perspectives on climate change and health adaptation. The participants were asked to fill out pre – and post-workshop surveys to evaluate the content, delivery, and to help assess what the participants learned.





## What Was Learned and Next Steps

Many youth expressed concerns about loss of sea ice and snow cover, and the implications for hunting and subsistence. They had concerns about late freeze and early thaw, and the increased risk associated with taking part in on-the-land activities. They also highlighted the importance of learning these skills from Elders and skilled hunters as a way to adapt to the changing conditions. The youth recognized the importance of transferring knowledge from older generations and expressed concerns that this was not necessarily taking place like it used to. It was interesting for the coordinators to hear about the connections the youth were making between climate change and loss of culture. Another area of concern for the youth was related to changing animal migration patterns and behaviours. The banning of caribou hunting on Baffin Island by the Government of Nunavut as of January 1, 2015, was brought up as a serious concern. There were also concerns about the change in behaviour of predatory animals, like polar bears. One youth researcher noted that there were increased polar bear visits to her town in recent years, and she wondered whether climate change may be attributable. In addition to northern-specific concerns, youth researchers also talked about the connectedness between events in the North and those in the South, with regards to climate change. They spoke about shared air and water, and the

movement of pollution and greenhouse gases. There was an understanding of a shared global fate, with actions taken in southern latitude regions impacting homes and communities in the North. Sharing stories, raising awareness, and taking part in advocacy were discussed as ways to spread the message, and to coordinate global mitigation action.



# Traditional Medicine



According to the World Health Organization, traditional medicine is “the sum total of knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures that are used to maintain health, as well as to prevent, diagnose, improve or treat physical and mental illnesses” (World Health Organization, 2013).

A focus on traditional medicine is crucial as it has strong historical, spiritual, and cultural roots within First Nation and Inuit world views. Traditional medicine is still the primary form of health care for 80% of the world’s population (Assinewe, 2002).

Traditional medicine knowledge holders have a profound understanding that there exists a binding relationship between environment and the use of plants as medicine (Assinewe, 2002). Knowledge holders place a great deal of importance on environmental factors such as time, place, and method of collection on the quality of treatment of body and soul. There are many protocols people follow when gathering, storing, and preparing medicinal plants. This is knowledge that is passed on from generation to generation through storytelling, traditional practices, songs and ceremony.

“Our Elders have predicted many of the things that are happening today. We need to bring our traditional knowledge together with western science so that together we may understand everything that is happening to our land and our water, to the animals and to our people so that we can adapt and survive.” – Northern Ontario First Nation Climate Change Workshop Participant (Four Rivers, Matawa First Nations, 2016).

Climate change is impacting ecosystems and species diversity around the world. Particularly in the Canadian North, we find increased rates of forest fires, invasive species, and resource exploration and development that are threatening native indigenous edible and medicinal plants (Capot-Blanc, 2009). It is therefore crucial that traditional medicine knowledge practices be supported and maintained for biocultural conservation of communities and environments, for future medical uses in the prevention and management of illness, and for safeguarding traditional medicine knowledge systems.

Northern First Nations and Inuit communities have taken action to preserve and use their traditional medicines. Through Health Canada’s CCHAP, two communities tell their stories of how changes in their environment are and will impact their ability to maintain traditional medicinal practices. These projects have focused on facilitating the transfer of knowledge from Elders to youth, to develop a better understanding of climate change impacts on medicinal plants, and to develop adaptation plans to secure a future which meets the health needs of people through traditional medicinal practices.

## Community Profile

Location: Carmacks, Yukon

Population: 670

Land Area: 36.95 km<sup>2</sup>



### CONTACT INFORMATION

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# Little Salmon Carmacks, Yukon

(2014-15)

### PARTNERS

Doóli Dán K'i Team of Elders and council staff from three Northern Tutchone communities: Selkirk First Nation, First Nation of Na-Cho Nyak Dun, and Little Salmon/Carmacks First Nation

### PROJECT INFORMATION

Good Medicine: Understanding and Adapting to the Effects of Climate Change on Use of Traditional Medicine

## Community History

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Little Salmon/Carmacks First Nation (LSCFN) is located in the Yukon Territory, along the Yukon River 175 km north of Whitehorse. Historically, the people were accustomed to the hardship of harsh winters, scarce food, and they survived a volcanic eruption that virtually destroyed the world they knew. The people adapted and survived through these catastrophic events and now, once again, face a time of significant change. Recently, community members have observed climate changes that are impacting the harvest of their traditional medicine. Some plants have

become contaminated from an old mine site nearby that has leaked contaminants into the water, and melting permafrost has further exacerbated the problem by compromising land stability in some areas, leading to the quick release of contaminants that would otherwise be released slowly over time. There is no end in sight to this problem, since new mine designs are not adequately anticipating the climate changes to come.



## Project Summary

The ability to harvest and prepare traditional medicine is dependent on the health of the community's natural surroundings, and as the climate changes, community health is impacted on many fronts. This project aimed to: put together a body of research and materials in order to gather stories about traditional medicines and past periods of climatic change; to use the stories to help understand the importance of traditional medicine in the communities today; to analyze how climate change is impacting the harvesting and practice of traditional medicine; and to develop a plan that would enable the community to adapt, sustain and expand the traditional medicine practice for their next seven generations as the world continues to change.

## Capacity Building

Project activities included meetings, workshops, interviews, and information dissemination:

- One annual Doòli Dan K'i Elders Gathering was held to provide guidance as to how the project should be structured and gain permission from NT Elders and practitioners to work with this sensitive topic; and two Doòli Dan K'i team meetings were held to oversee project progress.
- One student was hired provide project support and completed eight practitioner interviews while learning about Northern Tutchone traditional medicine.
- One Aunties Retreat with 90+ attendees (including 40 Elders) was held over one week out on the land to gather stories, learn and teach about traditional medicine.
- One Uncles retreat was held with two days devoted to men's traditional medicine stories, preparation and proper uses of medicine residual materials.

- Stories from all project activities were compiled and were proposed to be used as the basis for future decision making regarding the current state of NT traditional medicine practice.

## Traditional/Local Knowledge

LSCFN and NT Doòli Dan K'i employed the Northern Tutchone system of community engagement that was developed by the NT Elders to gather information about NT traditional medicines and the potential impacts of climate change. This is the most successful method known to address sensitive issues, it and charts a path forward with the guidance and blessing of the Elders. Northern Tutchone Elders had been working together since 2000 to gather stories and traditional knowledge about how the community once governed themselves for thousands of years. The guidance from the Elder stories, laws, and traditions was brought forward for the younger generations so that they could have greater knowledge of who they are and where they come from.

## Resources Developed

- Two large scale posters showing the retreat activities, and a general Doòli Dan K'I newsletter was developed and printed for distribution at Northern Tutchone summer general assemblies.
- One annual Doòli Dan K'i Elders Gathering was held to review the year's work, project results and propose a plan forward for climate change and Northern Tutchone traditional medicine. Elders provided guidance regarding the results of this year's project and what they require to move forward with traditional medicine adaptations to climate change and other pressures.



## What Was Learned

This project has confirmed that the community is on the brink of losing some of their traditional medicine due to climate change. The animals, land, water, and plants that they have relied on for generations are being impacted by factors such as unpredictable seasons, temperatures, melting permafrost, changing ice conditions, and forest fires. In some cases, Elders reported that there were only one or two gathering areas for certain traditional medicine ingredients. The loss of traditional medicine was and continues to be a very serious concern, and at-risk areas should be identified and protected.

## Next Steps

Elders recommended a proposed map forward for Northern Tutchone traditional medicine research, education and adaptation to climate change, which was proposed in budgets and workplans for the following fiscal years. The project team also proposed the following activities: to document traditional medicine gathering and preparation details; and to check habitat areas at risk over two summers by having a Northern Tutchone youth and translator work with traditional medicine practitioners. This on-the-land work would be filmed and would provide further details about the plants and wildlife species that are used, the plants and areas of harvest that are at greatest risk, and the effects of climate change on traditional medicine. The proposed activities could also provide verification of areas at risk through GPS mapping and Elders stories. Upon completing project activities, the community hoped to compile all materials gathered to date and to begin the process of creating products approved by NT Elders—a traditional medicine book, and educational materials for schools.



## Community Profile

Location: Haines Junction, Yukon

Population: 1,129

Land Area: Traditional territory spans 41,000 km<sup>2</sup>

### CONTACT INFORMATION

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# Champagne-Aishihik, Yukon

(2014–15)

### PARTNERS

Takhini River, Champagne, Aishihik, Klukshu, Kluane National Park Reserve, Kloo Lake, and Haines Junction, Kusuwa, B.C. Parks (Tatshenshini) and Dalton Post

### PROJECT INFORMATION

Documentation, Mapping and Identifying  
Traditional Medicines

## Community History

The homeland of Champagne and Aishihik First Nations (CAFN), located in the Southwest Yukon and Northwest British Columbia, is a land of great natural beauty and biological richness. CAFN was named after two of its historic settlements: Champagne, located on the Dezadeash River and Aishihik, situated at the headwaters of the Alsek River drainage. Today, the main administrative centre is located in Haines Junction. CAFN also maintains a busy office in the territorial capital of Whitehorse. There were a number of climate change impacts that the community was witnessing such as the changing weather patterns,

unpredictability of seasons, fires, melting permafrost and release of contaminants and other impacts that were affecting the plant medicines that CAFN had been harvesting for millennia.

## Project Summary

Traditional medicines are an important part of the community's healing and cultural practices. This project was developed for Champagne and Aishihik people to learn to identify and harvest traditional medicines within their territory





(all ages of community members attended the camps, from youth to Elders). Ten traditional medicine camps took place across the communities of Aishihik (67 participants), Klukshu (72 participants), Champagne and Takhini (35 participants), and Haines Junction (70 participants). Throughout each camp, in each traditional territory, medicinal plant locations were identified and recorded with a GPS. A booklet was then developed using the collected information, with additional detailed instructions of how to preserve and make medicines with the plants.

## Capacity Building

Across the camps, the following activities also occurred: traditional hunting and gathering of rabbits, gophers, caribou, and soapberries; daily language lessons; sewing moccasins and dance regalia; making dance paddles, and carving diamond willow walking sticks; the making of gaffing poles to catch salmon; sewing potlatch bags; preserving and jarring jam with Elders; learning to paint in Tlingit style; finding Klukshu sweet grass and learning how to identify, blanch and braid it for preservation; and traditional story telling with Southern Tutchone Elders.

## Traditional/Local Knowledge

Before all participants went out to harvest medicine, there were lessons given about the harvesting protocols, such as not taking the entire plant, harvesting only what was needed and never harvesting a plant unless verified by someone since some plants look similar to one another. All camp participants were taught that no medicine was to be taken without giving thanks to Mother Earth for allowing them to harvest the medicine.

## What Was Learned

The project was a tremendous success, and there was a lot of interest from CAFN citizens to learn about traditional medicines in their area. Furthermore, the project team found that this type of educational and hands-on work was extremely beneficial for Champagne and Aishihik First Nation. Since the citizens were actively seeking healthy and natural medicines to cure ailments, the camps ensured that traditional medicines were used. Many of the participants—including many of the Elders—did not know about the plants in their areas and were surprised that certain plants even existed (such as Evergreens). After the project, scientists also visited the Aishihik area looking for a purple plant that only grows there.

## Next Steps

Youth were an integral part of the learning and keeping community culture active and alive. The project team reported that it would be beneficial to have more youth attend these camps to learn about traditional medicines, language and other cultural activities. It was suggested that youth working for CAFN should be able to attend these camps without work penalty, and other non-staff youth should be given an incentive to attend.

Upon project completion, it was difficult to determine if climate change was affecting the strength and medicinal properties of the plants. At a later date, the team hoped to compare and test the properties of the plants collected through the project. They also hoped to test the strength of the same plant that would be harvested in the fall and in the spring to compare.

# Water Quality

A large white water drop with a blue outline is positioned on the right side of the page. Below it, there are several wavy lines in shades of blue and white, creating a sense of water movement or a landscape.

“Water resources are important to both society and ecosystems. We depend on a reliable, clean supply of drinking water to sustain our health. We also need water for agriculture, energy production, navigation, recreation, and manufacturing. Many of these uses put pressure on water resources, stresses that are likely to be exacerbated by climate change” (United States Environmental Protection Agency, 2016).

According to the UN's Intergovernmental Panel on Climate Change (IPCC), temperatures in the Arctic are rising about twice as fast as the global average. This rapid change in temperature is expected to impact the biodiversity and hydrology of Arctic streams and rivers. Increased water temperature causes shifts in aquatic ecosystems and can favour the growth of temperature sensitive water-borne bacteria and aquatic plants (algae) which could potentially pose health risks (Shirley, 2010).

Water is a fundamental component of the sustainability of northern regions, as well as the health and well-being of northerners, and for Indigenous communities. Climate change has impacted the fragile relationships of northern ecosystems by shifting seasonal transitions, reducing snow and ice cover, and increasing exposure to solar radiation. This has increased pressures on freshwater supply that have arisen from increased resource development, inappropriate or inadequate infrastructure, population stress, and erosion of Indigenous knowledge systems and culture (Medeiros, Wood, Wesche, Bakaic, & Peters, 2017).

Untreated natural water from local lakes, streams and rivers are important sources of water for northern communities. Many Nunavut residents perceive these sources to be healthier and cleaner than chlorinated tap water. However, there is little regular monitoring of the streams and rivers to verify the water quality over time. Community members wonder how changes will affect the quality of drinking water from these sources. Many regions are also interested in monitoring microbes and contaminants and are concerned at the potential health risks that they may pose.

The Climate Change and Health Adaption Program funded five projects focused on water quality. The Yukon and Nunavut projects tell stories on how they've led the acquisition of baseline measurements on water-borne bacteria and contaminants, trained local residents on water monitoring techniques, and provided recommendations for ongoing monitoring and surveillance to be used in the development of adaptive public health responses to climate change impacts on water quality.

## Community Profile

Location: Yukon communities: Beaver Creek (White River First Nation), Burwash Landing and Destruction Bay (Kluane First Nation), Dawson City (Tr'ondëk Hwëch'in First Nation), Pelly Crossing (Selkirk First Nation), and Carcross and Tagish (Carcross/Tagish First Nation)

Combined Population: 3,076



### CONTACT INFORMATION

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# Yukon River Inter-Tribal Watershed, Yukon

(2012-13) (2013-14)  
(2014-15)

### PARTNERS

### PROJECT INFORMATION

Phase I: Integrating Indigenous Knowledge and Public Health Concerns into a Community Contaminant and Climate Change Monitoring Program

Phase II: Climate Adaptation Strategies: An Intergenerational Effort to Combine Indigenous Knowledge and Western Science

Phase III: First Nation Climate Change Policy: a regional, Indigenous approach to climate change adaptation, health and water governance



## Community History

Phases I, II, and III of the project continued collaboration with five Yukon First Nations (White River, Kluane, Tr'ondëk Hwëch'in, Selkirk, and Carcross/Tagish). Each of the five aforementioned First Nations is a signatory member of the Yukon River Inter-Tribal Watershed Council (YRITWC) and participates in the direction of the YRITWC through biennial Summits and regional Executive Committee meetings. At the last YRITWC Summit, the signatory First Nations and Tribes approved the "Yukon River Watershed Plan." The plan combines the best of modern science and policy with the Traditional Knowledge of the Indigenous governments and people of the watershed to protect and improve the water quality in the Yukon River and its tributaries.

Elders and other key informants reported that climate changes are specifically affecting their subsistence activities (species availability, predictability, access, safety) and use of traditional drinking water resources. Water quality monitoring during the 2013 sampling season found metals (arsenic, cadmium, iron, lead and selenium,) and hydrocarbons (with a carbon range of C19-32, with the exception of certain polycyclic aromatic hydrocarbons in the same carbon range) at concentrations exceeding the Council of Canadian Ministers of the Environment's (CCME's) water quality guidelines for the protection of aquatic life at several sites selected by community members as potentially contaminated.

## Project Summary, Research Activities and Capacity Building

### Phase I Activities:

- Capacity Building: five youth interns and ten community members were trained to collect water quality samples and the interns were certified under YRITWC water quality protocols. Two youth interns and four community members trained in YRITWC Active Layer Network monitoring protocols.
- Recorded Indigenous observations of water resources: five focus groups were completed and recorded using field notes and audio-visual equipment. A mapping exercise was conducted and a total of 95 areas were identified as sites of concern. Overall, 49 individuals participated in the focus groups. Sixty-one interviews were also conducted and with key informants and recorded using audio.
- Collected water quality data from sites of concern: 35 samples taken of bacteria, metals, nutrients, and hydrocarbons and sent to ALS. Thirty YRITWC kits were collected and sent to USGS.
- Community-based monitoring plans were developed and would continue to be refined based on future data collection efforts.
- Community summary reports, presentations, and maps were prepared for each of the participating First Nations.

### Phase II had four primary objectives:

- To facilitate an intergenerational dialogue between youth and Elders on climate change, public health and adaptation strategies: workshops were held which involved a youth photovoice activity and an intergenerational knowledge sharing luncheon.



- To build scientific capacity in First Nations youth and governments: First Nations youth and/or government staff were trained in field methods for the health-related aquatic contaminant monitoring, the collection of surface water samples, permafrost monitoring and the collection of surface water samples.
- To monitor contaminated sites threatened by climate change: 25 sites were used for sample collections (metals, hydro-carbons, nutrients, and/or bacteria) which were then analyzed by a laboratory and compared to the Canadian Council of Ministers of the Environment's "Water Quality Guidelines for the Protection of Aquatic Life". The results were disseminated through presentations, community reports, and community calendars.
- To introduce FieldScope (a medium for collecting and analyzing data; data that can then be shared publicly) as a community tool and database for monitoring climate change. Six youth were instructed on how to use the database, topographical maps, global positioning systems, and GIS<sup>7</sup>. They were then shown how environmental observations (including field data, photos, and videos) could be uploaded to FieldScope and how community members throughout the Yukon River watershed can share their concerns and observations with the world.

#### Phase III:

- Brought First Nations leaders from across Yukon to recognize, prioritize, and address health concerns related to water and climate change at a regional level. Phase I and Phase II built the foundation for this "water action workshop." Originally, the YRITWC collaborated with five Yukon First Nations to establish climate change adaption plans. For the water action workshop, 14 First Nations were invited with 10 First Nations in attendance to formulate a region-wide water action plan. The project involved developing a two-day workshop in Whitehorse, Yukon for Yukon First Nations. A community report titled, "Water Action Planning Workshop Report", was developed after the workshop.

## Traditional/ Local Knowledge

Traditional knowledge informed all aspects of the project phases. During Phase I and Phase II, the project team conducted primary research documenting traditional knowledge among the five partner First Nations. Overall, interviews were conducted with 61 community members, including 33 Elders regarding their concerns about and Indigenous observations of the impacts of climate change and contaminants. Traditional Knowledge was also engaged within a participatory contaminants mapping exercise to identify sites of concern to community members and prioritized five water quality sites per First Nation, where water quality monitoring had been conducted previously; moreover, a dialogue was facilitated between 26 Elders and 23 youth in order to develop climate change adaptation strategies. Traditional Knowledge also informed the development of the First Nations water action plan given the research findings from project phases and subsequent workshops.

## Community Profile

Location: Baffin Island, Nunavut

Population: 1,617

Land Area: 173.36 km<sup>2</sup>

### CONTACT INFORMATION

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# Pond Inlet, Nunavut

(2014–15) (2015–16)

### PARTNERS

Vincent L'Hérault; Trevor Arreak; Emmanuel Maktar; Michael Milton, Jonathan Pitseolak, Marie-Hélène Truchon; Stephen Bathory, Qikiqtani Inuit Association; Jamal Shirley, Nunavut Research Institute; Jaylen Goorts, Department of Environment, Pond Inlet; Teresa Peryman, Department of Health, Pond Inlet Health Center; Rob Jamieson, Centre for Water Resources, Dalhousie University; Jean-François Lamarre, ARCTICConnexion/Centre for Northern Studies; Daniel Martin, Centre hospitalier de l'Université Laval (CHUL); Sherilee Harper and Ludovic Jolicoeur

### PROJECT INFORMATION

Phase I: Building Capacity to monitor fresh water quality in Pond Inlet-community needs assessment in a changing climate

Phase II: Expanding leadership in community-based research: Developing advanced capacity to study the risk of climate change on water quality in Pond Inlet

## Community History

Pond Inlet is located on the northern tip of Baffin Island, near the eastern entrance to the Northwest Passage in the Qikiqtani region of Nunavut. The community is also called “Mittimatalik” in Inuktitut after an unknown ancient person presumed to be buried there. Mittimatalik is still

considered a traditional Inuit community that is well-anchored in its past. Access to healthy water is of paramount importance for Mittimatalirmiut: “water is important to keep us alive and healthy; and bad water can be harmful for our people—our beloved Elders, youth and infants. Water also yields an important cultural value to our people” Tim Anaviapik-Soucie. Under the dire influence of recent





climate change, there was a common concern that the water quality might not be the same as it used to be as there had been observed changes in water colour and the taste of water during the summer. The community feared that their people were already being affected, since many had complained about stomach problems during summer, potentially due to uncleanness of water.

## Project Summary

The project team was encouraged by community members, especially Elders, to address the quality of the freshwater water in the community and the surrounding environment. For the first phase of the project, they aimed to develop essential research skills and to collect baseline data and local observations in order to understand the state of the fresh water, and to understand if it posed a risk to community health. They were most interested in exploring the interrelated topic of water use, water quality, stomach illness and climate change. In 2015, the community-based research was expanded to develop further capacity and to collect more data and local observations on climate change, water quality, and health. The overarching goal was to design a Community Adaptation Plan to mitigate the risks associated with the consumption of water in a climate change context.

## Research Activities, Resources Developed and What Was Learned

### Phase I:

- A survey with 53 respondents was conducted in Mittimatalik to document people's water use patterns, preferences, experience of stomach illness, and observations on changes in water quality.

- It was documented that rivers and icebergs are the two main sources of fresh water used during summer, and 30% of respondents have also experienced stomach illness during the summer.
- Microbiological quality and water chemical conditions were recorded throughout the summer on six sources of fresh water using Define Substrate Technology.
- Significant levels of fecal indicator bacteria were documented including total coliforms, *Escherichia coli* and enterococci in the fresh water.
- The Qilalukat River (Salmon Creek), an important area for summer camping and fishing, showed the highest level of fecal indicator bacteria and would thus require more attention in the future.
- Levels of fecal indicator bacteria were also correlated to the total daily precipitation and water conductivity. The only microbial-free source was the iceberg water.
- A sampling and classification protocol was developed for the examination of benthic invertebrates as indicators of water quality. They found a diversity of benthic invertebrates including insect larvae and pupa, crustacean (copepods, ostracoda), hydracarinae (water mites), annelids (worms) and collembola.

### Phase II:

- A course curriculum for Inuit high school students was designed to build capacity in research, and 7 youth were trained in water quality monitoring in Arviat during the summer. As a result of this initiative, a water quality pilot project was later initiated in Arviat.
- Positive correlations were found between water temperature, precipitation (month-before) and turbidity (associated with glacier melt) and fecal bacteria indicators (coliforms, *E. coli*, enterococci) in seven local freshwater sources (five streams, two lakes).



- The occurrence of gastrointestinal illness (GI) in the community was determined, with 25% of respondents experiencing cases of GI (symptom of diarrhea) in the month of August 2015. 42.9% of the people affected believed that their illness came from tap water.
- Water samples tested positive for *Listeria monocytogenes* in the municipal water source, and the in-town stream (at levels below the human hazard threshold). DNA-markers from dogs and humans were also found in a variety of local freshwater sources.
- A Cumulative Water Quality Index and a Cumulative Vulnerability Index was constructed for the freshwater sources monitored, and five Adaptation Targets were created to mitigate water quality risks.

## Community Voices on Capacity Building

“We have shown that with appropriate support from scientific experts and the necessary equipment, we can become real Inuit researchers by conducting our own reliable, accurate, and consistent research. This experience is a new way of doing research where Inuit are research leaders instead of research assistants, and academic researchers are assistants instead of leaders. Throughout this project we have developed skills for literature review, fund raising, sampling design, logistics, field work, laboratory work, data and statistical analysis, reporting, communication and mentorship. The skills built from this project will always stay with us, and will allow us to address future challenges.”  
Tim Anaviapik-Soucie

## Traditional/ Local Knowledge

For the first time in Nunavut, this project documented Elder observations and knowledge on the topic of fresh water. The cultural relevance of water was discussed, along with its uses in the past, and the historical changes in water quality in relation to pollution and climate change. The project located traditional water sources in order to understand the major changes that have taken place in the environment. The team also identified manifestations of climate change that have the potential to affect water quality, such as earlier melting snow and glacier ice, heavier rain, and warmer temperatures. Additionally, Elders expressed the need to find a new location for the municipal water source, and a proposition was made for a new site with deeper, fresher and flowing water. The feasibility of this idea would require a comparative investigation on the water quality found in this new potential source and the one found in the current community water source.

## Next Steps

Sharing project information with community members showed the project team how relevant the work was to the community, especially for Elders who expressed their gratefulness for the project and encouraged the team to continue with the environmental monitoring. The team's motivation, seriousness, and determination were rewarded when they received the 2014 Excellence in Water Stewardship Award granted by the Canadian Council of the Federation: “We are willing to take on this challenge and we look forward for expanding our capacity and evolving ourselves in research” Tim Anaviapik-Soucie.

# Access to Land



Communities dependent on ice for travel and subsistence practices are experiencing unpredictable conditions which are creating challenges to travel safety and food security.

Communities throughout the Arctic are reporting warmer and shorter winters, which have implications for the ice season and consequently on the access to local territories and resources by community members. Communities dependent on ice for travel and subsistence practices are experiencing unpredictable conditions which are creating challenges for travel safety and food security. Thawing permafrost and melting ice can pose health risks by hindering access to country foods, which are an important component of First Nations and Inuit diet for spiritual and nutritional well-being (Wein, Freeman, & Makus, 1996; Nuttall, et al., 2005; Kuhnlein & Receveur, 2007; Ford, et al., 2009; Mead, Gittelsohn, Roache, & Sharma, 2010).

“Losses and decreases in the thickness of lake and river ice and changes in permafrost conditions affect or threaten ice roads, restricting access to remote communities” (Arctic Monitoring Assessment Programme, 2017)

Travel safety is of concern as communities are experiencing high accident rates and loss of equipment. Traditional Ecological Knowledge (TEK) is often passed on by word of mouth and its reliability is heavily dependent on the knowledge of seasonal changes and weather patterns. Alterations in seasonal norms are impacting the nature of conventionally used ice paths and are forcing hunters to

replace them with uncharted passageways. Hunters are sometimes finding themselves in dangerous situations where high-risk choices are being made which may have been avoided.

“In the face of declining and unpredictable sea ice conditions, bridging scales and knowledge systems will be essential in developing integrated monitoring systems to respond to increased political and economic pressures as well as safety concerns for travelling on or within ice-covered oceans” (Laidler, et al., 2011).

CCHAP supported three community-based projects on access to land. Northern communities recognize that climate change is quickly altering their way of life, and have thus identified that increasing access to TEK and other knowledge systems on ice conditions could help improve travel safety and increase food security.

## Community Profile

Location: Akulivik, Quebec

Population: 615

Land Area: 76.87 km<sup>2</sup>



### CONTACT INFORMATION

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# Akulivik, Nunavik

(2012–13)

### PARTNERS

Sarah Anautak and Charlie Pinguatuk – Qekehrriq Landholding Corporation,  
Valter Balevic – Strata 360, Dollie Campbell – Makivik Corporation

### PROJECT INFORMATION

Real-time Monitoring for Travel Safety and Food Security in  
Akulivik, Nunavik

## Community History

Located on the shores of Hudson Bay, Akulivik, meaning “Central Prong of a Kakivak” in Inuktitut, is an Inuit community in the territory of northern Quebec. Akulivik takes its name from the surrounding geography. A peninsula jutting into Hudson Bay between two small bodies of water, the area evokes the shape of a *kakivak*, a traditional, trident-shaped spear used for fishing. A high percentage of community members in Akulivik rely on country foods with 65% of adults hunting and 77% of adults fishing for food. Due to the high reliance on country food, there are some food security and travel safety issues that all communities

in Nunavik face. The biggest community concern in Akulivik was the safety of the hunters and fishermen: thin ice and the resultant lack of marine species resulted in hunters and fisherman taking chances they would normally not take.



## Project Summary

Through the collection of Traditional Ecological Knowledge (TEK), the project sought to identify the most frequently used hunting and fishing grounds in winter and key winter travel routes to these locations. The project also aimed to identify locally observed changes in climate and examine their impacts on travel routes and safety: Had the travel routes been changing in recent times and why? How could the community determine which routes were safe? Finally, the project identified their influence on subsistence harvesting and food security for the local Inuit population. Once climate change indicators were identified, potential adaptation strategies were discussed.

## Research Activities and Capacity Building

The project was grounded in local knowledge and combined a number of different participatory approaches. Past studies conducted by Makivik have developed methodologies to engage Inuit Indigenous Knowledge on the local-level through community workshops, focus groups and semi-directed interviews. This research combined these different approaches, with a strong focus on workshops and map-based interviews.

- Field monitoring equipment was installed, including the satellite-linked weather stations not implemented in Phase 1. Field monitoring equipment provided real-time access of conditions along travel routes and integrated live images of conditions throughout the community trail system.

- Three-day workshops (with about seven attendees) were divided as follows: an initial presentation to community members, including a presentation of the workshop objectives and climate change issues; group interviews that included identifications of effects of climate change, possible adaptation strategies and development of community indicators to monitor identified changes; and seven individual interviews that were conducted with key informants identified by the community and were mostly map-based.
- An information and dissemination base on climate change and a web data delivery portal was established to evolve continuously as a planning and decision-making tool.
- Over 400 hunters were interviewed, leading to over 70,000 spatial records stored in a GIS.<sup>8</sup>

## Resources Developed

- Posters, maps, and a community atlas indicating all the data collected during the TEK interviews (species hunting / fishing areas, travel routes, ice conditions and dangerous areas).
- Project information brochures, a web portal, and a final report analysing the web portal activity results.
- Information on the project was also to be included in the quarterly *Makivik Magazine* and distributed to all Nunavik Inuit communities following the end of the project.





## What Was Learned

Monitoring ice conditions along key travel routes and lakes was expected to improve safety, allow for more efficient decision-making, reduce the number of accidents, provide better and more secure access to traditional foods, and raise awareness of climate change impacts within the local Inuit population. However, the extent and nature of the impacts of climate change in this region are still not fully understood. The community began to explore long-term possibilities of year-to-year monitoring of ice presence and thickness, and the information gathered for the three pilot areas in Nunavik was delivered to the communities via web-portal in near real-time.

## Next Steps

With a few years of data from the weather stations, and information collected at the community levels on the usefulness of real-time monitoring, the project team planned to publish a refereed journal about climate change monitoring in Nunavik using remote stations. The team also planned to continue to participate in conferences and trade-shows to share their experiences with other Indigenous groups, communities and the scientific community at large. Furthermore, regular interval sampling (ice thickness/arctic char samples) would provide baseline data to analyze temporal changes over time.





## Community Profile

### Location:

Population: Gwich'in (6,000),  
Tr'ondëk Hwëch'in (1,100), Nisga'a (6,000)

Land Area: Gwich'in owned 23,884km<sup>2</sup>



### CONTACT INFORMATION

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# Nisga'a, British Columbia and Tr'ondëk Hwëch'in and Gwich'in, Yukon

(2013-14)

### PARTNERS

Deanna Nyce, Wilp Wilxo'oskwhl Nisga'a Institute; Alestine Andre , Ingrid Kritsch, and Sharon Snowshoe, Gwich'in Social and Cultural Institute; Bill Kendrick; Jody Beaumont; Willie Modeste; Harry Nyce Sr., Nisga'a Fish and Wildlife; Dr. Jane Ruddick; Peggy Kormendy; Emma Nyce; Julia Jennings, Tr'ondëk Hwëch'in – Community Education; Darren Bolyn, Tr'ondëk Hwëch'in Land and Resources; Allison Nyce; Julia Adams, Nisga'a Valley Health; Annie B. Gordon; Dennis Allen; William Modeste (Willie Simon); and East Three School in Inuvik

### PROJECT INFORMATION

Documentary film of adaptation planning, shelter-building, and food harvesting: a Tr'ondëk Hwëch'in, Gwich'in, and Nisga'a Collaboration

## Community History

Gwich'in are one of the most northern Indigenous peoples on the North American continent. Like the Tr'ondëk Hwëch'in, they are members of the Athabaskan family of Indigenous peoples, but their language and lifeways are distinctive. They live mainly in four communities: Aklavik

(Ehdiitat Gwich'in), Fort McPherson (Nihtat Gwich'in), Inuvik (Teetl'it Gwich'in), and Tsiigehtchic (Gwichya Gwich'in). The Vuntut Gwich'in are those from the Yukon.



Tr'ondëk Hwëch'in, or "people of the river", is a Yukon First Nation and includes descendants of the Hän-speaking people, who have lived along the Yukon River for millennia. Tr'ondëk Hwëch'in is a diverse mix of families descended from Gwich'in, Northern Tutchone and other language groups.

Nisga'a lands stretch from the glacial headwaters to the estuary of the Nass River. There are four clans: Gisk'ahaast (Killer Whale), Laxgibuu (Wolf), Ganada (Raven) and Laxsgiik (Eagle). About half of their people live in the Nisga'a village of Gingolx, Laxgalts'ap, Gitwinksihlkw, and New Aiyansh.

The communities in the Northwest Territories, Yukon, and northern BC are highly dependent on country foods during seasons when it is difficult or impossible to bring fresh food in from southern areas. Transportation is especially difficult and unreliable in fall and spring, since the Dempster Highway is only open in the winter when the river is solid ice. The highway also interferes with the movement of caribou, making country foods and warm hides less available. Due to changes in the climate, increases in stormy weather and precipitation make it even harder to fly or truck food into the communities. Heavy fog and uncertain weather patterns frequently cause disruption in communications that make it difficult to know when transportation systems might be restored.

## Project Summary

This research asked the following questions: 1) How could a documentary video help the communities adapt Elders' knowledge (e.g. healthy seasonal harvests and moss-insulated shelters) as strategies for climate change? 2) How could communities produce interactive, visually engaging adaptation plans so they could influence, and be influenced by, those of other permafrost cultures? 3) When climate changes occur in the future, how would young people learn from and adapt traditions to suit the modern world?

This project shared with younger generations, the Traditional Knowledge that helped people survive during climate change events of the past: when Indigenous peoples living in permafrost regions had been most vulnerable to shortages of nutritious plants and to exposure when on the land. The project also built capacity in the communities through a video-making workshop held in conjunction with the Available Light Film Festival in Whitehorse.

## Research Activities, Capacity Building and Traditional/Local Knowledge

- Capacity Building in Film-making: a workshop was given to Tr'ondëk Hwëch'in and Gwich'in students concurrently with the Northern Lights Film Festival. Students filmed, edited, and presented their own documentaries about the Peel River Watershed.
- Research in Tr'ondëk Hwëch'in Territory and Healthy Berry Harvests: three Tr'ondëk Hwëch'in Elders were interviewed about the importance of harvesting berries and food plants, as well as the fish and animals (rabbits, ptarmigan, black bears, caribou, moose, etc.) that help resist infectious and chronic diseases. Elders also discussed climate change adaptation, and their ideas were recorded in text and on DVD.



- Research in Gwich'in Territory and the Moss House Project: the goal of this project was to offer young people the opportunity to learn traditional land-based survival strategies, such as building moss houses and harvesting foods from the land. A traditional moss shelter was constructed by Gwich'in Elders and high school students near Inuvik, Northwest Territories, as a case study of adaptation to climate change. All work was photographed and videotaped for a community-led documentary that included building capacity in film-making within the study regions. Discussions with Gwich'in Elders found that there were two different moss house types that were built traditionally: a full-scale model of the first type was built, and computer models of both types were developed for showing in the communities and at conferences.
- Research in Nisga'a Territory: in the Nass Valley, the project team worked with Nisga'a Elders on the harvest wheel, an ingenious diagram that correlates the timing of the harvest with climate and landscape changes. This became a part of the overall adaptation plan.
- An adaptation plan was created and agreed upon by knowledge-holders of all three Indigenous peoples. Recorded on DVD and in a booklet, the adaptation plan was presented at an International conference at Aurora College in Inuvik, and at the Wilp Wilxo'oskwhl Nisga'a Institute.

## What Was Learned

Elders expressed the importance of teaching young people to harvest country foods. The foods, including berries and other plant foods, contain medicine that helps people stay healthy. Knowing how to harvest sustainably, and the best time to harvest, is part of the traditional knowledge. Elders conveyed this principle to young people in all three regions. Learning how to build shelters with available materials was also a crucial component to harvesting country foods, thus numerous benefits were gained from the Gwich'in moss house reconstruction project in particular.



## Community Profile

Location: Coast of Hudson Bay, Nunavik, Quebec  
(only accessible by air)

Population: Kuujjuaraapik (657),  
Whapmagoostui (812)

Land Area: Kuujjuaraapik (8.16 km<sup>2</sup>)  
Whapmagoostui (189.88 km<sup>2</sup>)

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# Whapmagoostui and Kuujjuaraapik, Nunavik

(2014–15)

### PARTNERS

Sakkuq Landholding Corporation of Kuujjuaraapik,  
Cree Regional Authority, Strata360

### PROJECT INFORMATION

Real-time Monitoring for Travel Safety and Food Security  
in the Cree and Inuit communities of Whapmagoostui and  
Kuujjuaraapik (Nunavik)

## Community History

Kuujjuaraapik and Whapmagoostui are commonly known as the Twin Communities of James Bay and Nunavik, the gateway to Hudson Bay and the north. Known as Kuujjuaraapik, meaning “Little Great River” in Inuktitut, to the Inuit and Whapmagoostui, “Place of the White Whale” to

the Cree, these towns on the shore of Hudson Bay are the only communities in Canada where two of the country's First Peoples live side by side.



With the degree and complexity of climatic and socio-environmental changes becoming more intense across the subarctic, an integrated monitoring approach was required. Interdisciplinary research teams of Cree, Inuit and non-Aboriginal scientists used analyses that link environmental phenomena with social perception, to provide deeper insights into the implications of climate change for subarctic ecosystems and their residents, and to develop effective and culturally appropriate adaptation strategies.

## Project Summary

This project provided a concrete opportunity to establish successful partnerships, which brought together Cree and Inuit organizations, scientists and researchers for the purposes of implementing an ice monitoring system in the neighbouring Inuit and Cree communities of Kuujuaapik and Whapmagoostui. Built upon previous ice-monitoring projects in Nunavik, the monitoring program encompassed multiple areas of study. It was determined that the two main topics of study would include: 1) warmer and more unpredictable weather patterns, and, 2) travel safety. Additional areas of study included concerns regarding decreased access to traditional food due to unsafe trail conditions.

## Research Activities

The following activities were completed:

- Two interview periods were conducted, one with the Inuit and one with the Cree participants. In total, 14 Inuit and 6 Cree participants were interviewed .
- The project team documented and mapped traditional and current winter travel routes, sea ice conditions and hazards.
- The team investigated and identified appropriate technologies for the strengthening of community-based ice monitoring and travel safety systems. Future projects would integrate weather station data with measurements taken by local people to allow for a more complete data collection/monitoring sample regime. Participants also noted that website data should tie in with the local radio station, and conditions could be broadcast on the hour to increase audience benefits.
- Initial monitoring and travel safety systems were tested in the two communities.
- The existing Cree GeoPortal and Nunavik monitoring websites were enhanced to enable the provision of ice and winter travel information directly to the communities. The existing websites were expanded and updated with new information and new applications for live data delivery.
- The project team collected and provided data on changes in sea ice conditions: information on changes in sea ice conditions was captured during TEK interviews in both the Cree and Inuit interviews.



## Capacity Building

A monitoring system was adapted to the needs of the community and the data became available, in real time, to the Inuit and Cree hunters, trappers and communities of Kuujuaaraapik and Whapmagoostui. The project also ensured that young Inuit and Cree were involved in data collection and interpretation, through adequate training, in order to foster an interest in scientific careers. Researchers worked with the Inuit and Cree leadership to assist them in developing adaptive strategies for climate change.

## Traditional/Local Knowledge

As traditional Inuit and Cree knowledge are an integral part of the monitoring program, the project built upon existing Nunavik Inuit and Cree land-use studies and added to the traditional knowledge databases currently housed at the Makivik Corporation, the Cree Trappers Association and the Cree Regional Authority.

## Resources Developed

- Interviews were recorded and information included both spatial (map-based) and non-spatial information. Digitization of the information was conducted using ESRI's ArcGIS—ESRI is a supplier of GIS<sup>9</sup> software, and ArcGIS is a GIS software tool for mapping and spatial reasoning—and non-spatial questions were compiled and typed into the interview guides used during the interview.
- Final Traditional Knowledge maps were prepared for Inuit and Cree participants. Inuit maps included a map depicting caribou, goose and ptarmigan harvesting areas, char fishing areas, beluga and seal areas, as well as a travel map. One map was prepared for the Cree participants depicting all information collected including

ATV routes, canoe routes, snowmobile routes, traplines, campsites, caribou and goose harvesting areas, fishing areas, general hunting areas and open water/dangerous areas.

- Installation of the weather stations was originally planned during the warmer summer months. However, upon fabrication of the weather station equipment, the idea was simply not possible due to the weight of the equipment and rough terrain.

## What Was Learned and Next Steps

This project was very difficult to undertake as it involved two organizations and staff with scheduling conflicts and unforeseen delays. One significant factor to consider for future funding years is to allow the ability for multi-year projects, especially when the projects involve fieldwork in remote regions of Canada. The project team will seek additional funding to proceed with the initial project intentions, namely, getting the stations installed and developing a training program for community members to maintain the stations and to possibly collect in-situ measurements that can be used along with the weather data.



# Mental Health



Mental wellness is a broad term that can be defined as “a state of well-being in which the individual realizes his or her own potential, can cope with the normal stresses of life, and is able to make a contribution to her or his own community” (Health Canada, 2015). For Indigenous peoples around the world, culture, spirituality, a connection with the land, Indigenous values, and language are components to achieving mental wellness, and the feeling of cohesion and belonging further strengthens individual, family, and community life.

“First Nations and Inuit embrace the achievement of whole health – physical, mental, emotional, spiritual, social, and economic well-being—through a coordinated, comprehensive approach that respects, values, and utilizes cultural knowledge, approaches, languages, and ways of knowing” (Health Canada, 2015))

In 2015, the Truth and Reconciliation Commission detailed key historical issues that have exacerbated mental health disparities for Indigenous communities in Canada, and due to the legacy of residential schools, recent mental health crises have led to an unprecedented suicide epidemic among youth<sup>3</sup>. In response, First Nations and Inuit communities and leadership have been urging for the immediate integration of community-based approaches to mental health planning and services (Boksa, Joober, & Kirmayer, 2015).

CCHAP funded seven community projects focused on mental health, although many community projects note mental health as an important priority area. Through these projects, community members have engaged youth through land-based programming, the sharing of traditional knowledge, and supporting youth as active members of the community.

“Today, I feel frustrated when I hear so much talk about caribou. I feel bitter and helpless to address my concern about caribou. I felt who would want to listen to [an] old person like me. I worry about our future generation, how will they survive [when] there is no more food”. – A Whati Elder



## Community Profile

Location: Nunatsiavut communities of Rigolet, Makkovik, Postville, Hopedale, Nain

Population: Rigolet = 300, Makkovik = 360, Postville = 206, Hopedale = 560, Nain = 1,188

Land Area: 72,520 km<sup>2</sup>

### CONTACT INFORMATION

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# Rigolet, Nunatsiavut

(2012–13)

### PARTNERS

Inuit Community Governments of Nain, Hopedale, Postville, and Makkovik; Ashlee Cunsolo Willox; “My Word” Storytelling and Digital Media Lab (Rigolet); and Michele Wood (Nunatsiavut Government)

### PROJECT INFORMATION

Inuit Isumangit Kanuittailinitsangit Amma Sungiutisannik Silaup Asianguvallianinganik (Inuit Mental Health and Adaptation to Climate Change: A Nunatsiavut Regional Perspective)

## Community History

Rigolet is the southernmost Inuit community in the world, situated at the intersection of boreal forests and tundra. Rigolet has been very proactive with research projects in recent years, and with funding, has established Canada’s first Inuit-run centre for multimedia research: the “My Word”: Storytelling and Digital Media Lab. Rigolet was the research centre for this project, providing leadership, training, and administrative support to each of the regional sub-teams. The four Nunatsiavut community partners were Makkovik, Postville, Hopedale, and Nain.

Mental health is a key priority for Nunatsiavut, and more research is needed in this area. Climate-related mental health impacts were a newly-emerging health research concern, and this project is a leader in the field. More importantly, analyzing the environmental determinants of mental health through a multi-community Inuit perspective provided much needed data about the extent of the mental health impacts already experienced due to changes in climate—impacts that are expected to worsen with continued changes in the region.



## Project Summary

This project was dedicated to examining the relationships between changes in land, weather, ice, snow, wildlife, and vegetation and mental health and well-being in each of the five Nunatsiavut communities. The main research questions which guided this project were:

- What are the climatic and environmental determinants that impact mental health and well-being in Nunatsiavut Inuit communities?
- What are the mental and emotional impacts of adaptation?
- How can communities and health systems adapt to the mental health impacts of climate change?

## Research Activities

The research design was participatory, collaborative, and multi-disciplinary. Data was collected through ten in-depth interviews with key stakeholders from all five communities, as well as health professionals throughout the region and the Nunatsiavut government. Digital stories were created by participants in all five communities and facilitated by the “My Word”: Storytelling and Digital Media Lab from Rigolet. All data-gathering tools were co-developed in collaboration with all relevant parties. The project also included several research objectives that encompassed questions and areas of analysis, in addition to community training objectives focused on community capacity development.

## Capacity Building, Resources Developed and Communications

- Two project team meetings, in addition to a two-day intensive training session with six local research coordinators from each community. Training included interview techniques, research ethics, file organization, and data analysis. Five debriefing meetings were also held at the end of the project.
- An information night was held in each of the five communities to share and discuss project information. Sample digital stories were also showed.
- Five one-week-long digital storytelling workshops facilitated by the “My Word”: Storytelling and Digital Media Lab, one in each of the five communities.
- Five story-showing events, one in each of the five communities.
- 16 digital stories created by community members.
- 86 in-depth interviews conducted across the communities on the climatic and environmental determinants of mental health.
- Ten in-depth interviews conducted with health professionals and stakeholders in the region on the climatic and environmental determinants of mental health.
- Eight youth trained in a pilot participatory video project (filming, video editing, photography and video techniques, and storyboarding).



One participatory video created by the youth about life in Rigolet and dealing with a changing climate: [www.youtube.com/user/uKautsiga](http://www.youtube.com/user/uKautsiga); and one community-wide film showing of the video.

Eight in-depth interviews conducted with youth who participated in the video project, and eight in-depth interviews conducted with stakeholders about the impacts of the participatory video project for the youth.

One introductory video created about the impacts of climate change on mental health

30 video interviews conducted for one Nunatsiavut-wide documentary film on climate change and mental health, as well as 15 hours of “b-roll” footage (scenery, establishing shots, etc.).

Three manuscripts were prepared for publication in scholarly journals, and abstracts to be submitted for presentation at scholarly conferences.

One master’s student trained to assist with data analysis and the participatory video project, as well as two members from the “My Word” Lab trained in project management.

- Most research participants prefer to participate in narrative-based research approaches.
- Digital media is a great way to share information and knowledge on issues, and to do in a manner that reflects oral histories, highlights local dialects and cultures, and is easily shared far and wide.
- Deep listening makes all the difference to mutual understanding and cross-cultural experiences.
- A focus on strengths, opportunities, potentials, and current capacities creates for a more positive approach than focusing on vulnerability, weaknesses, and short comings.
- More emphasis should be placed on uniting researchers and communities through an equal partnership approach to research.
- Indigenous knowledge is absolutely essential to move forward with research and adaptation in a rapidly changing climate.
- Mental health is fundamentally important to community health and well-being, and more research needs to look at the linkages between place, environment, and mental health in Inuit contexts.

## What Was Learned

The project team reported the following conclusions:

- The importance of communities gaining the respect and recognition to conduct their own research, direct their own projects, and control their own budgets cannot be underscored.
- Inuit communities already have the capacity, knowledge, skills, and abilities to conduct their own research and to drive research design and delivery.



## Community Profile

Location: Nain, Nunatsiavut

Population: 1,250

Land Area: 94.58 km<sup>2</sup>

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# Nain, Nunatsiavut

(2012-13)

### PARTNERS

Community member representatives, Nain Inuit Community Government, Nunatsiavut Government, Labrador Grenfell Health Authority, kANGIDLUASUK Student Program Inc., Nutrition North Canada, Ulapitsaijet, Jens Haven Memorial School, Dr. Rachel Hirsch and Dr. Trevor Bell – Memorial University and Labrador Institute, Chris Furgal – Trent University and Nasivvik Centre for Inuit Health and Changing Environments

### PROJECT INFORMATION

Aullak, sangilivallianguinnatuk (Going off, growing strong) / A Youth-led Enhancement of the Community Freezer Program for Improved Mental Health, Nutrition, and Intergenerational Skills Transmission in Nain

## 142 Community History

Nain is the northernmost and largest community along the coast of Nunatsiavut, the newly formed Inuit self-government region of Labrador. It is a logistically isolated community, only accessible by air, boat or snowmobile. Climate change is having a major impact on the community of Nain. The north coast of Nunatsiavut has experienced the greatest percentage loss of sea ice in the past four decades of any region in the Canadian Arctic (73% overall ice loss and over 1,500 km<sup>2</sup> per decade). In addition, it is known that

environmental variability has an impact on mental health and wellbeing, physical health (e.g. nutrient deficiencies), food security, and knowledge/skills transmission, especially among young people. Like many Inuit communities across the Canadian Arctic, Nain has a vibrant population of young adults and youth. Over the past 10–15 years however, a higher number of young people in the community began to struggle with mental health and well-being. Nain has the highest suicide rate among all Nunatsiavut communities and one of the highest suicide rates across all Canadian Arctic and Sub-arctic communities. Mental health and



addictions counsellors in Nain suggested that “going off” (i.e. trips on the land and sea ice) is one of the healthiest behavior modifications that they would like to increase among struggling youth. To youth, “going off” represents an opportunity to gain a sense of wealth, wholeness and freedom, and is an opportunity to grow strong in a way that their parents and grandparents always did. However, 75% of the population does not have access to any of the three main modes of access to the land and its resources—a snowmobile, boat or cabin. These social, logistical and financial limitations compound the local impacts of climate change, present significant barriers to adaptation, and represent the reality within which any climate change adaptation tools must be approached.

## Project Summary

*Aullak, sangilivallianguinnatuk* (Going off, Growing Strong), based in Nain and Hopedale, was the first project of its kind in Canada focused on bringing together youth and harvesters to improve a community freezer program. Developed in response to community demand for intergenerational transmission of skills, the youth-led program aimed to help build youth resiliency in the face of widespread social, environmental, and cultural change. In addition, the pilot project led to the implementation of a climate change experiential education component within the *kANGIDLUASUK* Student Program. This project was about youth mentorship, building connections, and exploring the exceptional mental health benefits of land-based activities for youth at risk. The intergenerational skills transmission (youth, harvesters, Elders, etc.) supported by this program also empowers local youth and reinforces the strength of Inuit Knowledge, skills and values as a basis for climate change health adaptation.

## Research Activities

It was important to keep a well-documented record of activities, milestones, and the roles of various participants throughout the year, and the project team used stakeholder meetings, youth surveys, video diaries, photo videos, a communal brainstorming board, peer interviews, member checking, trip logs, and youth-led teaching modules.

## Capacity Building

There were ten youth participants (ages 14–21) who were selected after careful deliberation with the Jens Haven Memorial School, the Nunatsiavut Government Department of Health and Social Development, and Labrador Grenfell Health about which youth in Nain would benefit most from this program. From March 2012 to 2013, youth activities included:

- 156 youth days (16 trips) out on the land with experienced hunters.
- 10 trips to distribute wild meat to Elders.
- 6 movie nights where youth socialize with program staff and each other.
- 12 youth days where youth learn how to make traditional items used to hunt for or prepare country foods.
- 2 community dinners in celebration of wild foods.
- 2 nights helping prepare meats for the community freezer.





## What Was Learned and Next Steps

While the project team was still working to measure the impact of the program, preliminary evidence indicated improvements in youth participants' self-reported hunting skills, including the acquisition of new skills, improved access to the land, and the development of new social connections in the community. It was hoped that this intergenerational youth outreach program would become a core pillar of climate change health adaptation activities in Nain and for the region in the following years.





## Community Profile

Location: Nunatsiavut, Newfoundland and Labrador

Nunatsiavut Population: 2,500

Land Area: 72,520 km<sup>2</sup>

### CONTACT INFORMATION

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# Rigolet, Nunatsiavut

(2013–14)

### PARTNERS

Dr. Ashlee Cunsolo Willox; Marilyn Baikie and Inez Shiwak, "My Word": Storytelling and Digital Media Lab; Herb Jacque, Makkovik; Myrtle Groves; Diane Gear, Postville; Greg Jacque; Wayne Piercy, Hopedale; Anthony Andersen, and Dasi Ikkusek, Nain; Michele Wood; Dr. James Ford; Joanna Petrasek MacDonald; Lesya Nakoneczny; Climate Change Adaptation Research Group (CCARG), McGill University; Indigenous Health and Adaptation to Climate Change (IHACC), McGill University; Inuit Knowledge to Adapt to the Health Effects of Climate Change (IK-ADAPT), McGill University; Tom Sheldon, Department of Lands and Natural Resources Division of the Nunatsiavut Government, in partnership with Michelle Kinney, Department of Health and Social Development; as well as the Inuit Community of Governments of Rigolet, Makkovik, Postville, Hopedale, and Nain

"For me, I didn't have anyone showing me skills when I was younger. ...The program is really good because it shows more skills to more people, instead of waiting for the skills to die out because they are not getting taught by Elders or family members."

### PROJECT INFORMATION

Fostering Youth Mental Health and Resilience to Climate Change

## Community History

Nunatsiavut (Our Beautiful Land) is the homeland of the Labrador Inuit. The self-governing region was established in 2005 from the Labrador Inuit Land Claims Agreement, and it stretches from the Torngat Mountains in the north to the beautiful and rugged coastlines in the south. There are five Inuit communities in Nunatsiavut (south to north): Rigolet, Makkovik, Postville, Hopedale, and Nain.

## Project Summary

This project developed, expanded, and implemented targeted, community-specific, and responsive programming and research to enhance resilience and adaptive capacities to climate change in each of the five communities in Nunatsiavut through two programming strategies: the expansion of the *Aullak, sangilivallianguinnatuk* (Going Off, Growing Strong) in Nain and Hopedale, and the creation and piloting of the *IlikKuset-Ilingannet!/Culture-Connect!* program.



## Capacity Building I

*Aullak, sangilivallianginnatuk* (Going Off, Growing Strong) Program expansion activities:

- Over 220 youth days on the land (Going Off, Growing Strong).
- Over 12,000 km travelled on land, sea ice and water (Going Off, Growing Strong).
- Harvesting activities included: seal hunting, partridge hunting, moose hunting, fishing, *ukalik* hunting, picking mussels, dragging for scallops, goose hunting, trapping and wooding.
- In-community activities included: delivering community freezer country foods to Elders and households in need, country food soup dinners, pancake and country food breakfasts, building *komatik*, building char smokehouses, volunteering at community events and country food and movie nights.
- Applied Suicide Intervention Skills Training (ASIST) for all program staff in Nain.
- Presentation at Canadian Association for Suicide Prevention conference in Winnipeg in 2013.
- One of three highlighted sustainability panels at the International Conference of Arctic Social Sciences.
- Three manuscripts for peer-reviewed publication – two in final stages of preparation, one submitted.
- Featured on Parliament Hill in February 2014 as one of six nationally selected “*Research Impact – Turning Research into Action*” programs that were highlighted.

- Going Off, Growing Strong was one of the components of the much bigger Sustainable Communities Initiative, which was awarded an Arctic Inspiration Prize in December 2013 for its vision and action plan towards sustainable housing in Nunatsiavut.
- Going Off, Growing Strong was to be highlighted in a fall 2014 social innovation exhibit by the World Economic Forum.

## IlikKuset-Ilingannet! / Culture-Connect! Program Summary

The *IlikKuset-Ilingannet! / Culture-Connect!* program is a youth mentorship program working in Rigolet, Makkovik, and Postville. The program brings together five youth with five adult mentors in each community to learn cultural skills, such as hunting, trapping, food preparation, snowshoe-making, music, carving, art, and sewing. Each youth spends approximately four weeks with each mentor, spending three to five hours per week learning the skill. Each youth participant also has the opportunity to work with each mentor throughout the duration of the project. This programming assisted both youth and adults in connecting together in a positive environment dedicated to knowledge transmission and cultural skills development, aiding in strong cohesion among generations and a sense of self-worth in both generations. As well, this program became a strong adaptation strategy to cope with the effects of climate change.



## Research Activities and Resources Developed

- 43 in-depth interviews were conducted with all youth and mentors.
- Eight video interviews conducted with youth participants as dialogue for the participatory video.

One participatory video created by the youth, showcasing their documented experiences as students of culture (YouTube: <https://www.youtube.com/watch?v=EAulcH3uXnc>).

Three community-wide participatory video showings (one in each of the three communities).

A five-day youth gathering, bringing together youth, coordinators, and research management from the three Nunatsiavut communities to discuss the project and share cultural experiences.

Three-day youth editing session to compile and produce the participatory film.

Two conference presentations at the International Conference of Arctic Social Sciences and the Environmental Studies Association of Canada conferences (additional presentations planned at Arctic Change and future conferences).

Two manuscripts in preparation for peer-reviewed publication with communities and local researchers as co-authors; and one invited book chapter was in progress with communities and local researchers as co-authors.

## Capacity Building II

Each youth spent approximately 30 hours with each mentor, for a total of approximately 150 hours of programming for each youth. There was approximately 750 youth-mentor contact hours in each community. In total, the program provided approximately 2,250 youth-mentor hours. In addition, youth regularly interacted with each other and with the Local Coordinator in each community, for about 5–7 hours per week as part of this program, leading to approximately 150–200 additional contact hours in each community.

## What Was Learned

The majority of participants agreed that cultural-based programming such as this could be an important, sustainable, and impactful adaptation strategy for the community, as it provided opportunities to connect with culture even when the land was not accessible and it also connected participants with known protective factors (e.g. connecting with culture, family, and community; building skills; enhancing confidence and self-esteem; providing hope for the future; building positive relationships with peers and adults).



## Community Profile

Location: Behchokò, Northwest Territories  
(approximately 80 km northwest of Yellowknife)

Population: 2,064

Land Area: 75.17 km<sup>2</sup>

### CONTACT INFORMATION

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# Behchokò, Northwest Territories

(2014–2015)  
(2015–2016)

### PARTNERS

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the High School, and the Arctic Institute of North American at the University  
of Calgary.

### PROJECT INFORMATION

Phase III: Keeping Our Community Healthy: Solutions for  
Adapting to the Changing Environment

Phase IV: Actions for Adapting to Climate Change

## Community History

*For more community information or earlier project phases, see the 2012–2013, and 2013–2014 reports contained in this document.*

The 2014 fire season was one of the worst in Northwest Territory's history. Combined with declining emotional and physical health as it relates to on-the-land practices and climate change, fires quickly became the

most pressing concern for Tłıchq. Community members are increasingly disconnected from the places and resources that define them; places and resources that contribute to their well-being. Many health risks are associated with reduced access to the land and a loss of traditional harvesting activities. In some areas, fires that continued to burn underground impacted land access and overall safety.



The Elders' Advisory Committee (EAC) in Behchokò was concerned for the physical and emotional well-being of the community, such as the mental health problems of Elders and harvesters who could not travel or harvest the land due to water, snow, ice, and temperature changes. Elders were also concerned about youth who lacked knowledge of traditional methods on the land: "youth must know how to 'watch' the land so that they know when, where, and how changes are occurring".

## Project Summary

Building on Phases I and II of the project, Phases III and IV were designed to develop and test solutions for mental and physical health problems associated with climate change. For Phase III, the four Tłıchq communities of Gamèti, Whatì, Wekweèti and Behchokò came together from February 23–24, 2015 to address the climate change impacts in the surrounding area. A group of 11 Elders, including harvesters on the land and some youths discussed the impacts. During Phase IV, a canoe journey and a cabin building activity were among some of the land-based solutions, since the solutions were designed to support a healthy lifestyle while adapting to the effects of climate change. The solutions also offered ways to be on the land, by doing traditional activities in a safe manner, with people of all ages. The research took place with Tłıchq from Behchokò, at the Rae-Edzo Friendship Centre.

## Research Activities

The research focused on 1) whether or not the solutions from earlier phases were having an impact on minimizing depression and anxiety related to climate change; 2) determining if the youth, harvesters, and Elders felt more connected by working together to adapt to on-the-land changes; and 3) did participants feel more hopeful after learning about healthy diets associated with store-bought food combined with country food.

The research team used an open-ended discussion to determine individual feelings about their own health, and the community's health and well-being, as well as to determine if the proposed solutions were working to decrease depressed, anxious, or disconnected feelings. The project team also focused on anxiety and depression before and after the on-the-land trips.

## Capacity Building

- Youth were involved in all aspects of the planning leading up to both the cabin building, and the canoe journey.
- For youth, learning to respect, interact and learn from Elders and harvesters was ongoing and important before any activities commenced.
- During the cabin building activity, Elders were on the land together with harvesters to teach the youth stories and skills.
- Canoe journey: traditional travel by canoe, with support of Elders and harvesters, encouraged youth to maintain a traditional way of life while learning survival skills. The community considered the canoe trips to be an opportunity to re-trace the past and see the past through the eyes of the Elders.

## Traditional/Local Knowledge

From earlier project phases, the project team continued to focus on the importance of traditional harvesting and use of on-the-land resources to maintain physical, spiritual, and emotional health. The project also drew on the expertise of the newly formed division, Aboriginal Health and Community Wellness, Health and Social Services, GNWT, who agreed to lead one-day workshops on issues relevant to the EAC's concerns.





## Community Profile

Location: Hay River Reserve,  
Northwest Territories

Population: 329

Land Area: 134.07 km<sup>2</sup>

### CONTACT INFORMATION

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# K'átł'odeeche, Northwest Territories

(2015–2016)

### PARTNERS

Gagos Social Analysts; Chief Sunrise Education Centre; Aboriginal Health and Community Wellness, GNWT; Aboriginal Aquatic Resources and Oceans Management Program Dehcho; Environment and Natural Resources, GNWT

"We dedicate this report to Elder Solomon Smallgeese, who passed away on February 24, 2016. Solomon was always happy to share his knowledge of the land, especially stories of Ejíé Túé, where he was raised."

### PROJECT INFORMATION

Finding Solutions to the Health Impacts of Climate Change

## Community History

K'átł'odeeche First Nation resides on the Hay River Reserve in the Northwest Territories. For the descendants of the Dene people, the traditional territory is centered around Ejíé Túé (Buffalo Lake), Ejíetúé Deé (Buffalo River), K'átł'odeeche (Hay River), and the shore of TuCho (Great Slave Lake). Over the last five decades, the NWT has experienced average annual temperature increases of 2.5°C, and it is predicted that this warming will continue to

increase two to four times more rapidly than other regions in the world. Dene people across the north have local awareness regarding the impacts of climate change, yet at the same time, are aware that their observations of the links between changes in the sub-arctic and health have received little attention.



## Project Summary

The overall goal of the project was to formulate a climate change strategy, based on traditional K'átl'odeeche culture, values, and laws, to respond to community needs and circumstances. The project team sought to find solutions for the health issues related to the impacts of climate change, and to work with the Chief Sunrise Education Centre to help students think about climate change from a K'átl'odeeche Dene perspective. To accomplish this, the research team explored the following questions: How do members of K'átl'odeeche First Nation experience climate change in their daily lives? How do these changes affect the overall health and wellbeing of K'átl'odeeche First Nation community members? How does climate change affect Dene-land relations?

## Research Activities

In order for the community to find a long-term approach that was readily adaptable, they used a Participatory Action Research (PAR)<sup>10</sup> method guided by the Elders. The PAR approach is grounded in the view that the community members are leaders in the research process, from research questions and methodology to action planning. Research activities included research training (focused listening, field notes, and documentation); community meetings and workshops to explain the project and verify information; on-the-land harvesting experiences and activities; and storytelling. In all activities, stories were vital to understanding.

## Capacity Building

- Three community researchers went on the land with Elder harvesters: the Elders ensured that the researchers followed the appropriate respectful relations with the land while they collected and discussed local medicines. The researchers noted Dene yatié and English names.
- Hunting: during the hunt, community researchers were able to experience the harvesters' stories, such as how low water levels impact the hunters' movement and therefore the significance of the moose hunt to available traditional food for the community. The researchers took photos, made notes, and used a GPS device to track their movements—noting places of environmental changes. Several community members mentioned Mackenzie Rock as an indication of how much the water in TuCho has dropped, stating that “at one time you could only see the tip of the rock and now you can see about eight feet”.
- One on-the-land trip with Elders and students from the Chief Sunrise Education Centre (K to 9): during this trip, Elders guided the students to learn K'átl'odeeche knowledge and relations with the land; this guiding included stories, observations, and photos. The research team then collaborated with the Chief Sunrise Education Centre to bring students, Elders, and harvesters together to learn about the importance of the land and changes that were occurring. Later, they broke up into smaller groups to collect specific traditional medicines.

<sup>10</sup> **Participatory Action Research (PAR):** is a research approach for community which promotes community participation and action. PAR is a collective and self-reflective inquiry process for researchers and participants directly linked to action, influenced by understanding of history, culture, and local context and embedded in social relationships.



## Traditional/Local Knowledge

Community members did not limit their discussions to climate change. For them, the changes to the land occur because “humans have forgotten how to respect the earth and each other”; this includes disrespecting human and cultural variation, as well as animals and plants and other beings that inhabit the earth. For the community, climate change is a result of long-term disrespect and misuse of what the earth has to offer.

For all the participants, the connection to K’átł’odeeche traditional territory is an intimate relationship of living with the environment. The land provides spiritual growth and a remembrance of ancestral guidance from the past to the present. Participants of all ages expressed a deep connection to the land, and to the trails and places where their families travel for emotional, physical, spiritual, and intellectual sustenance and health.

## Communications

As the project team reported, the Chief visited the community researchers when he had time, encouraged them, and reaffirmed the importance of this work. The Chief wanted the community to know, through his actions and support, the importance of the research and to make sure all activities as outlined in the proposal were fulfilled.

## What Was Learned

- With limited access to traditional foods, community members reported experienced anxiety related to harvesting sufficient food for their families. They were extremely concerned about potential health issues surrounding the replacement of healthy traditional food with the store-bought food that they could afford.
- The women who harvested berries and medicine agreed that there were fewer berries due to dryness, and the men explained that there were fewer animals in the area, as well as shifts in wildlife ranges, especially wolves, bears and moose, coyote, magpie, fish.
- Safety concerns further enhanced community fear and tension: they know they must travel on snow machines over weak ice and through wet snow, covering water-drenched trails in *ts’ue* (muskeg) areas, and by boat where unpredictable winds are particularly hazardous.
- Furthermore, community members experienced feelings of hopelessness due to the continuing loss of K’átł’odeeche land and way of life.

Research results stressed the importance of telling Dene stories, providing experiential knowledge, and teaching skills to young people to ensure future generations have a Dene voice and the power to speak for their land, their community, and themselves. Elders and harvesters continued to “watch and use the land” so that they could fulfill their role in guiding their community while taking action.



## Next Steps

Notwithstanding the stress associated with climate change, the community remained focussed on maintaining their connection to traditional lands. They remain optimistic that if they respect and know the land, the land would teach them and take care of them in the future, as it has done in the past. "If younger generations neglect what the land has to offer, the land will stop giving".

Following project activities, the community intended to formulate an in-depth, long-term adaptation plan that was based on traditional K'átl'odeeche culture, values, and laws. The plan would incorporate non-K'átl'odeeche Dene, including scientists who specialize in permafrost, water, and climate change, and Dene who know the plants and animals that are expanding their range into K'átl'odeeche territory. The plan would also include a more involved relationship between public school students and Elders.





## Community Profile

Location: Pelly Crossing, Yukon

Population: 350

Land Area: Traditional Territory spans 15,000 m<sup>2</sup>

### CONTACT INFORMATION

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# Selkirk, Yukon

(2015–2016)

### PARTNERS

Arctic Institute of Community-Based Research (AICBR), Marilyn Van Bibber, Norma Kassi, Molly Pratt; SFN youth and Elders, Selkirk Spirit Dancers, Eliza Van Bibber School; Teddy Charlie; Colton Blackjack, Daniel Tuck, Kylie Williams, Tamara Silas, Dylan Alfred, Cameron Silas, Lois Joe; Robert Joe

“Traditions have to keep going. It is our identity and who we are”

### PROJECT INFORMATION

Keeping Our Traditions for the Health and Mental Wellbeing of Future Selkirk First Nation Generations: “What do we do at the fish camp when there is no fish?”

## Community History

Pelly Crossing is the home to Selkirk First Nation, and it is a rural and remote community in central Yukon. The majority living in Pelly Crossing belong to the Northern Tutchone linguistic group of Athabaskan people. Traditional lifestyle is a crucial determinant to the health and wellbeing of Selkirk people. The connection between the land, the animals and people is a way of life, and Elders say you can't separate the people from the land—that they are one.

Over recent years, the rapid change in climate brought forth a number of challenges for SFN people and the land lived so closely with. A decline of salmon in particular had been a threat for several years and in 2014, most fish camps remained empty until later in the season due to a ban on fishing salmon.





## Project Summary

For the community, the fish camp is at the heart of Traditional Knowledge exchange between Elders and youth, and so its importance is paramount. Community concerns regarding salmon prompted the research question: "What will we do at the fish camp if there are no fish?" The main focus was to maintain traditional Tutchone knowledge, practices and culture while finding a viable community-based adaptation strategy amidst the threat of climate change. In particular, the goal was to continue the fish camps, even when there were no fish in the rivers, and to ensure the health and mental well-being of young people and future generations.

## Research Activities

- Employed a mixed methods approach of community-based participatory research and Indigenous methodologies. The community was involved in every stage of the project from planning research questions, implementing research activities and approving the data.
- An Advisory Committee of community members, Elders, SFN Lands and Resources, and SFN Health and Social ensured the relevancy of findings and community ownership over the research process.
- An education and training workshop with two youth was completed: the workshop taught community-based participatory research methodology (two days), communication and life skills throughout, and climate change ("Our Land", one day) as it relates to the role of fish camps and mental health ("Healthy Minds", one day).

- Advisory meetings, two presentations to SFN Chief and Council to provide updates, focus groups (one youth focus group, Elder interviews at the fish camps, and 40 responses at a community feedback session), and community gatherings engaged community members in information exchange, and allowed for community feedback/advice.

## Capacity Building and Resources Developed

- Ten semi-structured interviews at the fish camps were conducted by two youth researchers who also took photos. Youth were also employed to gain experience in running a camp.
- All youth participated in the two workshops (one on youth mental health, and the other on climate change) held at the 5-day winter fish camp and all participated in traditional skills development of net fishing, trapping, and making crafts; one camp manager and two Elders worked with the youth at the winter fish camp.
- Photovoice: six cameras were distributed and a tremendous amount of photos were taken which led to the creation of a fish camp guidebook. A video documentation of youth involvement was also completed and edited into a YouTube video.





## What Was Learned and Next Steps

- There was a deep commitment to continuing the practice of the summer and winter fish camps, and resilience to do so in the face of changing times and an uncertain future, even if fewer to no salmon were returning to the rivers.
- By being on the land, the people could see firsthand what changes were taking place.

To adapt to climate change and preserve culture, the community made several priorities:

- Connecting youth to the land
- Thinking outside of the box in order to find solutions
- Raising their voice as Selkirk First Nations people
- Utilizing their self-government in decision-making



# Building Regional Capacity: Workshops and the Selection Committee


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“Indigenous, local, and traditional knowledge systems and practices, including indigenous peoples’ holistic view of community and environment, are major resources for adapting to climate change, but these have not been used consistently in existing adaptation efforts. Integrating such forms of knowledge with existing practices increases the effectiveness of adaptation” – Workshop Participant, 2016

Over the past four years, CCHAP has conducted a series of capacity building and knowledge sharing workshops in Yukon, the Northwest Territories, Nunavut and Ottawa for Inuit and northern First Nation community members, governments and organizations. The purpose of the workshops was to share Indigenous perspectives on the impact of climate change in First Nations communities in northern Canada, to identify strengths and adaptation practices that help Indigenous communities to adapt to climate change, and to share funding opportunities that support Indigenous communities to take action to address climate change impacts. Furthermore, the interactive format of workshops encouraged participants to explore ideas, think about partnerships and possible regional collaborations, opportunities, and next steps.

“During workshops, delegates expressed the urgent need for more community-based research that incorporates western science with traditional knowledge. They agreed that research initiatives must be community-driven, community-based, and must build First Nation capacity, especially for youth” – Workshop Participant, 2016

To share knowledge, community representatives as well as university researchers, non-governmental organizations, and government programs were asked to make (climate change, monitoring, food systems, etc.) presentations. Participants were then divided into regional groups to discuss the impacts of climate change in their communities and traditional territories. Participants also considered community and regional climate change priorities related to community infrastructure, health, and community well-being, and then engaged in a world café exercise to further discuss arising themes.



The workshops were also a time for participants to learn about Indigenous Services Canada's funding program, ask questions, and work on proposals to submit to the program for funding. The workshops strengthened partnerships and enabled the program to align with the needs and wants of communities. The program is planning future capacity building workshops where needed.

The Department "has successfully applied a collaborative, capacity-building model to increase resilience to climate change risks" – Workshop Participant, 2016

The CCHAP Selection Committee meets annually in person to discuss the eligible proposals, compare evaluations and ratings, determine relative proposal rankings, and make proposal funding recommendations. The committee is made up of First Nations community members from all regions, one youth and one Elder, as well as government and non-government representatives who have a strong background in climate change, health and community issues.

Proposal evaluations are conducted based on the criteria set out in the annual call for proposals and a Funding Application Guide. Recommendations are made with consideration to the amount of funding available for projects in the respective year and the relative ranking of the proposals evaluated. Only the proposals that achieve a high enough standing, as determined by consensus of the Selection Committee are recommended for funding.

CCHAP has endeavoured to build capacity in communities whose proposals were not accepted by offering comments from the Selection Committee. These comments are provided to help communities improved their proposal for subsequent years funding should they decide to reapply for CCHAP or any other funding programs.

# Conclusions and Emerging Priorities

The Department “has successfully applied a collaborative, capacity-building model to increase resilience to climate change risks” – Workshop Participant, 2016

The impact of CCHAP is discussed in terms of four themes:

1. **Enabling northern First Nations and Inuit communities to identify and assess key vulnerabilities and health impacts related to climate change.**


- Direct funding provided to community organizations ensured that control of the research agenda resided in community hands, and engagement of northern committees in funding decisions strengthened the program by making appropriate knowledge and expertise available to applicants. Community control also facilitated the engagement of Elders and youth in projects. This improved the prospects that each CCHAP project would fit into long-term community goals and needs.

2. **Developing scientific and community-relevant information to support northern First Nations and Inuit communities in adaptation to climate change.**

- Where the community projects were successful, they also usually created demand. The capacity building component of CCHAP projects enabled communities to provide “on-the-job” or co-op style education and training especially to young community members. Moreover, a number of projects demonstrated advanced skills in communicating about projects and sharing the results, using the internet and video technology, as well as face-to-face activities.

3. **Combining Indigenous Knowledge (Traditional Knowledge) with formal science through community-based research to support sound adaptation policy development.**

- Reliance upon and transmission of traditional knowledge is a priority for the northern communities that participated in the CCHAP. Direct funding to community researchers encourages research that draws upon traditional as well as scientific knowledge. Many projects did this by helping to ensure that the knowledge held by Elders and others in the community was directly available to the projects, so that it could be used to guide and inform their work. This in turn made appropriate blending of scientific and traditional knowledge feasible. Culturally appropriate and on-the-land research also yields more impactful results.



#### 4. Understanding the CCHAP in an international context:

- The CCHAP program itself has received international attention through major conference presentations and international attention to publications about the program itself, and publication of the results. In fact, several CCHAP-funded projects have received the attention of international organizations, including the United Nations Framework Convention on Climate Change (UNFCCC). CCHAP funded projects were showcased at UNFCCC's 16th annual meeting, a forum in which actions aimed at climate change mitigation and adaptation are discussed.

With continuing success, CCHAP has facilitated new partnerships between individuals, communities, governments, and academia, which has increased community capacity as research leaders in the North. For example, a traditional knowledge study conducted by Jean Marie River community members in 2004–5 (funded from non-CCHAP sources) revealed that Elders in the community were concerned about climate change. This led to two very productive CCHAP-funded projects focused on the health adaptation consequences of changes to permafrost. These projects were partnerships between community members and scientists from Yukon College, Athabasca University and others; they yielded a much deeper understanding of consequential changes to permafrost, explained in academic publications, a permafrost vulnerability hazard map, community workshops, an active section on the First Nation's website, and other means of communication. These projects and their results also attracted the attention of the news media. Climate change research continues in Jean Marie River, supported by partnerships with other academics.

Of particular importance is the program emphasis on youth involvement in the research process. Youth have learned a variety of skills such as on-the-land skills from Elders, leading to positive strides in mental health, education, travel safety and more. Moreover, the development of tools and applications to address climate change impacts has improved decision making and has enhanced community resiliency to address future challenges.

As seen within this report, projects results have led to the expansion community gardens in Yukon, the Northwest Territories, and Nunavut; the translation of traditional and scientific knowledge into Indigenous languages; the development of pilot monitoring programs for aquatic species in the ISR; increased participation in land-based cultural education programs for youth and Elders across the Arctic; the development of mobile applications in Nunatsiavut; and the creation of many youth photovoice projects about changing lifestyles due to climate change.

# A Way Forward

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“Programs such as this one have the potential to support democratic development in northern communities. They can support the development of community knowledge institutions, and build a legacy of skills and expertise. This should be acknowledged and supported as are similar functions in other parts of Canadian society” (Abele & Gladstone, 2017).

In 2016 CCHAP was split into two regional programs: a northern program which continues to focus on northern health adaptation from a regional perspective (CCHAP North); and a new southern program which is designed to mirror previous work that was conducted in the north and establish health adaptation efforts in First Nations communities South of the 60<sup>th</sup> parallel (CCHAP for First Nations South of 60°N). In 2017, with the establishment of Indigenous Services Canada, the First Nations and Inuit Health Branch and CCHAP were transferred from Health Canada to this newly created Department. In 2016, an impact analysis and synthesis report was undertaken by researchers at Carleton University (Abele & Gladstone, 2017). The report explored what CCHAP funding enabled Northern communities to achieve. It explained the features of the program that were most helpful to communities’ research and adaptation goals. It also demonstrated that several communities in Northern Canada developed significant

expertise in research management, research design and interpretation of results – as well as advanced capacity for communicating results using streaming, video, radio and documentary films.

Some of the changes the CCHAP North has adopted as a result of the CCHAP Synthesis Report, as well as engagement sessions hosted in partnership with CIRNAC, include the creation of territory-specific climate change adaptation committees and the funding of liaison staff positions in external organizations to assist communities and organizations in accessing climate change adaptation funding. These committees—five total, one for each territory, as well as Nunavik and Nunatsiavut—consist of northern partners and climate change expertise from each locale. They review proposals received to the CCHAP North and provide funding recommendations, allowing northerners more say in the funding decisions made in their jurisdictions. The liaison positions—five in total, one for each territory, as well as Nunavik and Nunatsiavut – are hosted in third-party organizations across the five jurisdictions. They exist to provide additional capacity to communities and organizations in accessing federal climate change funding, specifically—but not limited to—the CCHAP North and CIRNAC’s adaptation programming. These liaisons also act as the secretariats for the 5 climate change adaptation committees. These committees and liaisons are shared between the CCHAP North program and CIRNAC’s adaptation program (the Climate Change Preparedness in the North Program).





The CCHAP North has moved to provide increased flexibility to successful applicants. Contribution agreements from the CCHAP North only use flexible funding, which allows the carry-forward of unexpected, unspent funds from year-to-year. Also, the CCHAP North does not have a strict proposal deadline, but rather accepts proposals on an on-going basis throughout the fiscal year. These proposals are reviewed by their respective committees at regular intervals throughout the year.

Additionally, based on the engagement sessions held across the North, the CCHAP North is working to encourage proponents to move towards the implementation of climate change adaptation actions. With a decade of successful projects under the program, partners were interested in seeing a shift from monitoring and knowledge transfer, towards solution and action-oriented projects. Though the CCHAP North is limited by what project proposals are submitted to it, proponents are encouraged to actively think about more concrete adaptation actions. The CCHAP North is also working to solicit larger (i.e. multi-community or regional) and multi-year proposals in the North.

Building on the past 10 years of successes, the CCHAP North will continue to provide northern First Nations and Inuit communities and organizations funding to undertake climate change adaptation projects to help lessen the health impacts of climate change and improve the health outcomes across the Canadian North.

In southern First Nations communities, there is a real and urgent gap in conducting research and adaptation plans to minimize risks to health. Communities and regions are feeling the effects from numerous climate change impacts, such as sea level rise, erosion, drought, extreme heat floods, extreme and unpredictable weather, and access to traditional foods, to name a few. In 2017, the Climate Change Health and Adaptation Program expanded to First Nations south of 60°N for the first time.

Indigenous Services Canada's new CCHAP for First Nations South of 60°N provides up to \$100,000 annually for community-based or regional research – and action-oriented projects, to support southern First Nations communities to minimize risks and adapt to the impacts of climate change on human health. This program creates an opportunity for southern First Nations to engage with their communities/regions in monitoring, research, assessment, and discussion in order to develop local/regional adaptation action plans to reduce health risks caused by a changing climate. Indigenous leadership is playing a key role in the success of the program. Central to CCHAP is the concept of a community/regional-based approach to research, allowing communities to identify the areas of adaptation research and vulnerability-assessments that are of greatest importance to them.

By engaging local and regional partners in program and funding priorities, CCHAP is advancing adaptation decision-making with respect to human health and a changing environment, and taking steps to return control of programs that support Indigenous communities back to these communities. Indigenous Peoples are able to see themselves represented in the governance structure of the program, building trust between the government and communities. This enables community members to develop projects that will have a long-term community impact by responding to community needs, making it much more likely that research will find a use, and giving communities hope of a better future.

# Website: Climatetelling.info

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“Indigenous, local, and Traditional Knowledge systems and practices, including Indigenous peoples’ holistic view of community and environment, are a major resource for adapting to climate change, but these have not been used consistently in existing adaptation efforts. Integrating such forms of knowledge with existing practices increases the effectiveness of adaptation” (IPCC, 2014).

The Climate Telling web portal exists to create awareness about climate change and the impact on human health facing Indigenous communities in Canada. The website provides resources and tools for Indigenous communities interested in undertaking climate change and health related initiatives and a platform for sharing knowledge, expertise and experiences while exploring opportunities for collaboration between scholars, professionals and community advocates. This is a space created by the community, for the community. Communities that participated or would like to participate in a climate change and health community project provides an opportunity for learning and sharing with others.

[www.climatetelling.info](http://www.climatetelling.info)

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Centre, Aurora College, Baffinland Iron Mines Corp.,  
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Council), Ecology North, FoTenn Planning and Urban  
Design, Frozen Eyes Photography Club, Gagos Social  
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