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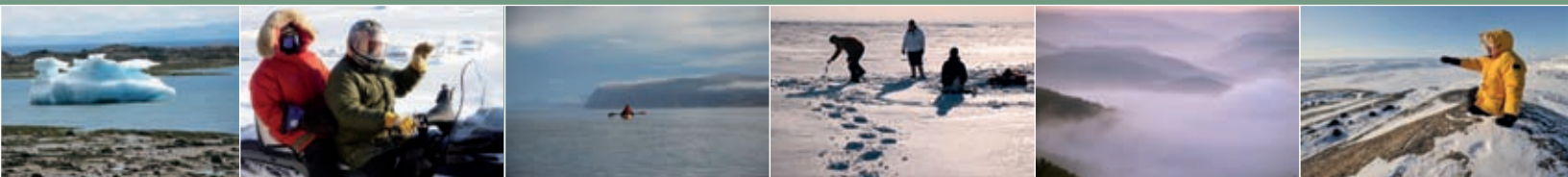
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Communities Voices on Climate Change and Health Adaptation in Northern Canada

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

Research & Action and the Stories Behind Them

2008 - 2011



Environmental Public Health Division
Interprofessional Advisory and Program Support Directorate
First Nations and Inuit Health Branch, Health Canada

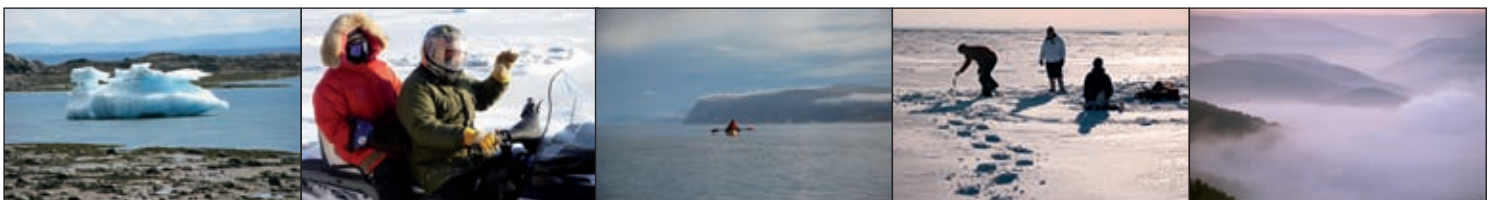
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“Research & Action and the Stories Behind Them”

2008-2011



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Climate Change

and Health Adaptation Program for Northern First Nations and Inuit Communities

Introduction

Health Canada's Climate Change and Health Adaptation Program was developed as a means to support northern First Nations and Inuit communities in conducting their own research on matters that are of importance to them as they relate to the effects of climate change on their health. The Program was envisioned in part by the collected observations, findings and perspectives of a series of workshops held in Inuit communities across the Canadian North and published in the document *Unikkaaqatigiit – Putting the Human Face on Climate Change*¹ as well as observations from the Assembly of First Nations in their document *How Climate Change Uniquely Impacts the Physical, Social and Cultural Aspects of First Nations*.²

Central to the Program is the concept that communities determine the areas of research that are of greatest importance to them; develop the tools and methods to adapt to these changes; and incorporate scientific, traditional and/or local knowledge; and engage their community in the results they have developed. Health Canada invested \$7 million to support these locally driven initiatives. The Program works closely with northern governments and organizations to increase their knowledge and capacity to develop health-adaptation strategies at the community, regional, and national levels with respect to human health impacts in a changing climate.

The following report summarizes the 36 community-driven research projects that were funded by Health Canada's Climate Change and Health Adaptation Program since its inception in 2008. Each summary has been shared by the communities themselves or designated project representatives as they are the gatekeepers of this data. Through their efforts, communities have increased their knowledge and understandings of the health effects related to climate change and have started developing local adaptation strategies. Examples include: numerous film and PhotoVoice products that engage youth and Elders; community-based ice monitoring; surveillance and communication networks; and a variety of information products such as fact sheets on land, water and ice safety, drinking water safety, food security/safety, and traditional medicine – all of which are highlighted throughout this document.

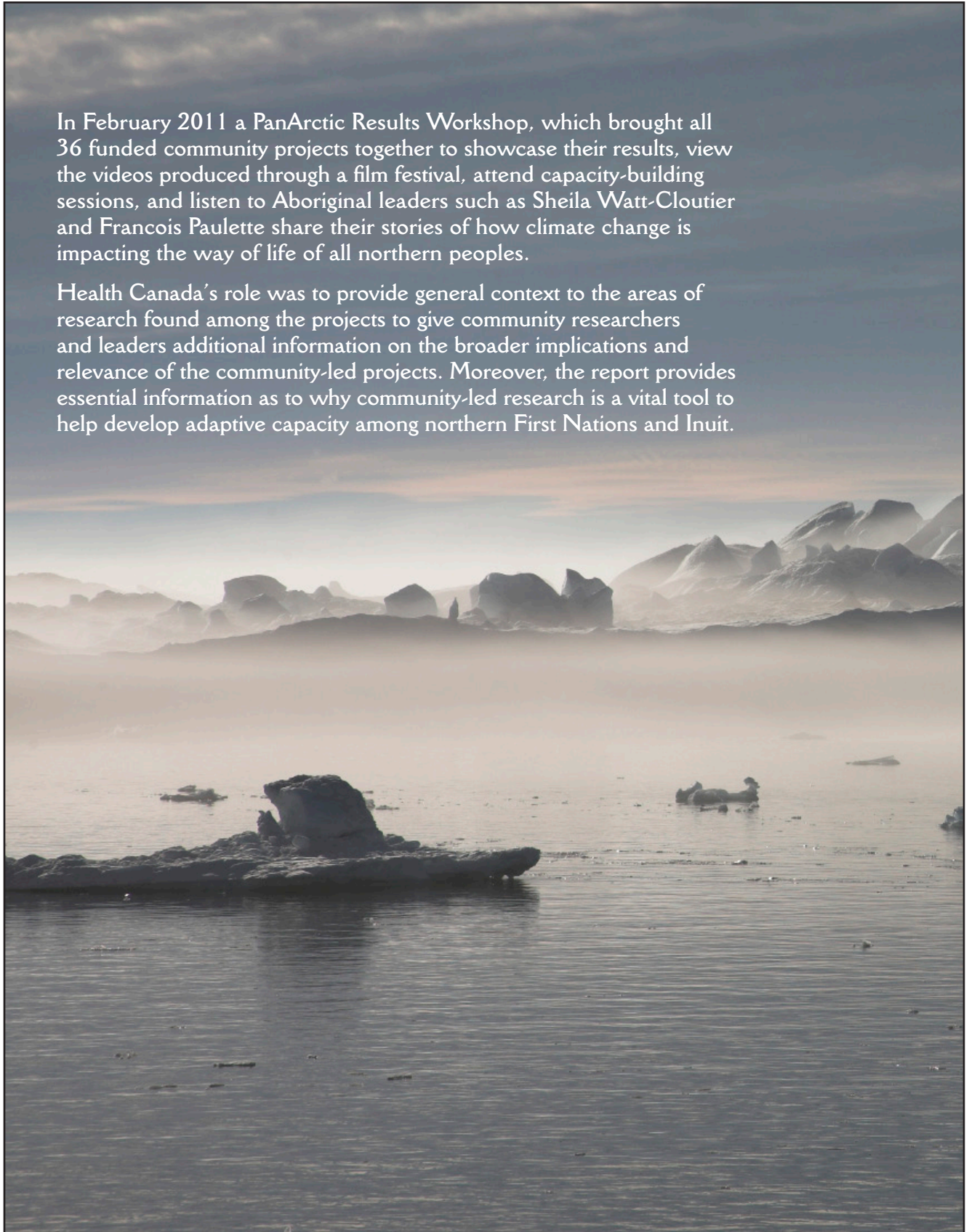
¹ <http://www.itk.ca/publication/canadian-inuit-perspectives-climate-change-unikkaaqatigiit>

² http://www.afn.ca/uploads/files/env/report_2_cc_uniquely_impacts_physical_social_and_cultural_aspects_final_001.pdf



In February 2011 a PanArctic Results Workshop, which brought all 36 funded community projects together to showcase their results, view the videos produced through a film festival, attend capacity-building sessions, and listen to Aboriginal leaders such as Sheila Watt-Cloutier and Francois Paulette share their stories of how climate change is impacting the way of life of all northern peoples.

Health Canada's role was to provide general context to the areas of research found among the projects to give community researchers and leaders additional information on the broader implications and relevance of the community-led projects. Moreover, the report provides essential information as to why community-led research is a vital tool to help develop adaptive capacity among northern First Nations and Inuit.



Research & Action and the Stories Behind Them

Food Security

We all know that food is fundamentally important for sustaining human life. Beyond survivorship, humans all around the world have developed a spiritual, social, and economic relationship with foods. They are an integral part of our identity, shaping our physical, emotional, and cultural dimensions. They supply the essential nutrients and medicines, which allow communities and societies to grow. They also provide a time where families and friends gather to share stories, laugh, dance, and cry. Their availability and accessibility have in the past been heavily dependent on environmental factors, where agricultural, gathering, hunting, and ceremonial practices have reflected this relationship.

For northern First Nations and Inuit, country foods continue to be socially, economically, and spiritually important for their health and well-being (Nuttall *et al.* 2005). Cultural practices, such as hunting, gathering, food preparation, and language have been heavily shaped by food availability and accessibility. Today, northern peoples have access to store foods as well as country foods such as seal, caribou, arctic char, berries, and beluga. The increased access to high-carbohydrate store-bought foods has been shown to have negative health effects (Kuhnlein and Receveur 2007), whereas, country foods have been documented as often being nutritionally superior and preferred to store foods. (Wein *et al.* 1996; Nuttall *et al.* 2005; Kuhnlein and Receveur 2007; Poppel *et al.* 2007; Ford *et al.* 2009; Mead *et al.* 2010).

Ensuring that northern First Nations and Inuit have access to country foods in a changing climate is of outmost importance for a healthy physical, mental, and spiritual lifestyle. 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.





The importance of food security for northern First Nations and Inuit has been reflected in community-led research proposals submitted to Health Canada's Climate Change and Health Adaptation Program. Since 2008, 11 out of 36 community funded projects from across the Canadian Arctic focused on food security related issues.

“Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life”

- FAO (1996) Declaration on world food security. World Food Summit, FAO, Rome.

You will find below the 11 success stories on the research and action led by communities and their partners. They tell the stories of the impacts of climate change on people, the relationships built between scientists and community, and provide a sense of the realities of food security in the Canadian Arctic.



Old Crow, Yukon

COMMUNITY PROFILE

Location: Yukon
2011 Census Population: 245
Land Area (square km): 14.17
Website: <http://www.yukoncommunities.yk.ca/communities/oldcrow/>

PROJECT INFORMATION

Phase I: "Gwich'in Youth and Scientists Climate Change and Health Research Symposium in Northern Yukon: What do our changing homelands mean for our health?"
Phase II: "Vuntut Gwitchin Climate Change and Health Research in Northern Yukon: What do our Changing Homelands Mean for our Health? Phase II: Knowledge into Action"
Phase III: "Vuntut Gwitchin Climate Change and Health Research in Northern Yukon: What do our Changing Homelands Mean for our Health? Phase III: Community Action on Climate Change and Food Security Adaptation in Old Crow"
Year(s) Funded: Phase I 2008-2009; Phase II 2009-2010; Phase III 2010-2011
Partner: Vuntut Gwitchin Government
Shel Graupe & Megan Williams (Dept. Natural Resources, Heritage Branch)
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Titles:

Phase I: "Vuntut Gwitchin Climate Change and Health Research in Northern Yukon: Gwitchin Youth and Scientists Climate Change and Health Research Symposium: What do our changing homelands mean for our health?"

Phase II: "Vuntut Gwitchin Climate Change and Health Research in Northern Yukon: What do our Changing Homelands Mean for our Health? Phase II: Knowledge into Action"

Phase III: "Vuntut Gwitchin Climate Change and Health Research in Northern Yukon: What do our Changing Homelands Mean for our Health? Phase III: Community Action on Climate Change and Food Security Adaptation in Old Crow"

Old Crow Food Security Adaptation Strategies

"It's good. We've got some good input here. And we got the building blocks; now we just got to make it happen."
(Focus Group Participant)

- I) Long-Term Storage Facility
- II) Animal Farming
- III) Land-Based Skills Training & Other Education
- IV) Fish and Wildlife Surveys
- V) Other

Community History – The History of Our People

Old Crow is the northernmost community in the Yukon. It is a small village situated 130 km above the Arctic Circle, home to the Vuntut Gwitch'in First Nation, which in the Gwitch'in language means "People of the Lakes". Vuntut Gwitch'in life and culture have traditionally been based on the Porcupine caribou herd, the people's main source of food, tools, and clothing. Fish and other animals have supplemented their diet in nutritionally and traditionally important ways.

This life is changing every day, before their very eyes. The mainstay of their traditional diet, the caribou and the salmon, are rapidly declining in numbers. The cost of living is extremely high as there are no roads to Old Crow, so all supplies must be flown in year-round.

Why Study Food Security in Old Crow?

Changes to the land and water are taking their toll on the very existence of the Gwitch'in people. The environment that the people travel and depend on, the waterways and the land, have changed quite drastically in very few years. People of the Lakes, named in ancient times due to the connection to one of the biggest wetlands in North America, are now watching these lakes disappear. Old Crow Flats, situated 50 km north of Old Crow, has been considered a 'bank' for traditional foods for eons and the permafrost under the tundra is now thawing. Huge lakes home to freshwater fish, muskrats and beavers, and were also home to many species of migratory birds, have disappeared and have become a dry parched desert.

Research teams from the 2007-2008 International Polar Year (IPY) initiative looked at food security in the Old Crow Flats and reported results to the community in late Jan. 2009. These findings generated considerable concern amongst community members, resulting in recommendations for continued work on health adaptation strategies and actions, and for youth involvement.

Project Summary: How Old Crow is Leading the Way

The "Vuntut Gwitch'in Climate Change and Health Research in Northern Yukon" project was a three phase food security and climate change initiative that began in Old Crow, Yukon in 2008. The project was initiated by the Vuntut Gwitch'in citizens in Old Crow, who invited the Arctic Institute of Community-Based Research (AICBR) to work with them in response to their concerns about changes to their traditional harvesting and hunting areas, and changes in the distribution and abundance of several traditional food species.

The first phase of AICBR's project included a large gathering in January 2009 where the youth actively participated with the community in various climate change workshops with International Polar Year researchers to learn about environmental changes in the Old Crow area. Educational topics focused on during the workshops included tree ring readings; diabetes prevention; ice age fossils, bones and insects; historical air photos; permafrost; moose and muskrat food security; and hydrology and wetlands. Throughout this meeting, Elders shared valuable traditional knowledge with the youth, and many people shared thoughtful wisdom and advice with them as well. From this gathering, there was a strong recommendation from the youth and the rest of the community that the research continue, and so AICBR developed a proposal for Health Canada and received funding to do Phase II.

This research focused on learning what food security adaptation strategies the community has been doing and could do in the future to help cope with climate change. This phase involved training youth to develop their researching skills; and three youth interviewed over 30 members of their community. In addition, four youth were trained in film and they developed their own trailers about food security in their community.

Continuing to follow a community-based participatory research framework, the research for the third phase of the project (2010-2011) focused on assisting and facilitating the community in determining how Old Crow could implement their recommendations from Phase II (2009-2010) and put them into action in order to address food security issues.

You can learn more about the project and watch the full length film "*Our Changing Homelands, Our Changing Lives*" and trailer "*The Good, The Bad, and The Ugly*" by visiting <http://www.aicbr.ca>.



Capacity Building – Connecting the Guidance of the Past with the Needs of Today

Capacity building among youth, Elders, and community members was facilitated through:

- Hands-on training for youth who interviewed community members about food security;
- Training in video production;
- Public speaking (presentation at the Climate Change and Health Results Workshops – 2011);
- Use of computers as a research tool; and
- Providing community-based research training to youth researchers and a local research assistant.

Discussion groups engaged Old Crow community members in discussions about climate change and health, specifically food security, which increased their capacity to contribute to the development and implementation of food security adaptation options.

Youth participating in this project actively learned from their Elders traditional knowledge, supporting intergenerational knowledge exchanges.

The widespread **distribution of the video documentary** “Our Changing Homelands Our Changing Lives” will educate people locally to internationally about the present effects of climate change in the North Yukon from a community perspective, thereby increasing capacity for policy makers and politicians to respond to climate change issues.



Next Steps – How We Are Adapting to Climate Change

“So we have to prepare ourselves. We’re such a small little group of people who, who want to survive and continue surviving.” (Focus Group Participant)

“To me we have to act now.” (Focus Group Participant)

- Continue to promote and share Our Changing Homelands Our Changing Lives DVD;
- Secure funding to support, research, and facilitate the implementation of community recommendations for coping with food security issues as a result of a changing climate. This will be done through:
 - Traditional teachings and educational opportunities on traditional storage, food preservation and preparation techniques, gardening, and health and nutrition reflective of food availability and accessibility;
 - Assessing local bird species harvested for sustenance in the traditional territory; and
- Continue to engage the youth in community-based activities related to the food security adaptation recommendations.

Ross River First Nation, Yukon

COMMUNITY PROFILE

Location: Yukon
2011 Census Population: 352
Land Area (square km): 20.62
Website: <http://www.yukoncommunities.yk.ca/communities/rossriver/>

PROJECT INFORMATION

Title: "Caribou, Culture & Climate Change"
Year Funded: 2009-2010
Partners: Northern Contaminants Program, Dena Kayeh Institute, Canadian Boreal Initiative

CONTACT INFORMATION

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Title: "Caribou, Culture & Climate Change"

The **Kaska** are scattered across the Kaska Traditional Territory, three in British Columbia (Kwadacha First Nation, Dease River First Nation (Good Hope Lake) and Daylu First Nation (Lower Post) and two in the Yukon (Liard First Nation (Watson Lake), and Ross River Dena Council). The Kaska Dena occupy a Traditional Territory that is 24 million hectares straddling the borders of the Yukon, British Columbia and Northwest Territories. This represents 20% of the Yukon, 5% of Northwest Territory and 10% of British Columbia - together about the size of Switzerland.

Ross River Dena Council is a First Nation in the eastern Yukon Territory in Canada. Its main centre is in Ross River, Yukon at the junction of the Campbell Highway and the Canol Road, near the confluence of the Pelly River and the Ross River. The language originally spoken by the people of this First Nation is mainly Kaska, although a number of the First Nation's citizens are Slavey speakers. The First Nation, which has 483 registered members, is a member of the Kaska Nation.

The Ross River Dena Council has successfully conducted a caribou study which was completed in 2010; this study was funded by a Contribution Agreement through Health Canada. There are seven caribou herds in the Ross River area alone; Tay River herd, Red Stone herd, Magundy herd, Pelly Mountain herd, Finlayson herd, Tsa Zsol herd, and Nahanni herd.

The caribou study gathered information from Ross River Dena traditional knowledge holders and scientists and produced a 40-minute DVD video. The following summary is the results of the study:

Traditional Knowledge – was a central part in the study. Ross River Elders were encouraged to have their say and share their views as to their observations gathered in the study. It was learned that there were vast numbers of caribou in the Ross River area and at times, there were little - the conclusion was that there was a cycle of abundance and scarcity. There was also a management system when

the number appears to decline by hunting other species or elsewhere where the numbers are better. Traditional land stewardship is guided by traditional laws that were handed down through the many generations of Kaska ancestry. Predator control was also observed when populations of wolves increased.

Science was also an important component in the study. Harvested caribou were tested for contaminants as was done previously in the 90's. Not only were the kidneys tested but muscle tissue and body weight information were also gathered. The science was to be compared with other studies throughout the Arctic circumpolar region of the world.

Climate Change we are now experiencing have never been observed prior to present day events, and it is having a broad effect not only on caribou. Much earlier spring thaw-freeze has taken its toll on caribou calves, and created difficulties in caribou getting to their food through the snow crust that forms over them. We also noticed that the summer months are a lot warmer, which makes it difficult for the caribou as they go higher into the mountains to seek out snow patches, and to get away from many insects on windy ridges.

Wildfires are also a huge concern as they destroy core winter habitats and the lichen the caribou depend on for food. It also causes travel disruptions if the fires go through travel corridors.

Resource Development increased interest in resource development such as mining is beginning to impact the caribou as more access roads and other mining related activities are happening in previously isolated regions.

Over Harvesting is also highlighted as more hunters are beginning to come as other caribou populations are dwindling elsewhere. As the population increases due to more people settling in the Yukon, we see this problem will only increase as a result. The Elders have great concern for the fall hunt as the larger bulls (breeding stock) are harvested and the hunting season carries late into the rut season when the meat is tainted and not appetizing, which may result in meat wastage.

Contaminants are also being identified as a concern as scientist conducted studies in the 90's and identified cadmium levels, which have increased in caribou in the Tay herd. A 2011 follow-up study has shown the levels have remained as previous results. Many of the Ross River Elders believe this may be the result of the Faro Mine project, which is located 60 km downstream from Ross River. The local concern takes on more emphasis as more mineral interests are being discovered in the region.

Management Planning is most favourable to Ross River Elders where traditional knowledge and science can be equally applied to establish a management plan. The Ross River Dena Council entered into a three year agreement with the Yukon Government to manage resource development in the Ross River area, which is currently in its second year. Ross River has also negotiated a Wildlife Plan with mining companies and is a line item when engaging mine proponents.



Igloolik, Nunavut

COMMUNITY PROFILE

Location: Nunavut
2011 Census Population: 1454
Land Area (square km): 103.01
Website: <http://www.explorenunavut.com/igloolik.php>

PROJECT INFORMATION

Title: Climate change and food (in) security among female Inuit:
A case study from Igloolik, Nunavut Year(s) Funded: 2008-2009

CONTACT INFORMATION

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*Title: Climate change and food (in) security among female Inuit:
A case study from Igloolik, Nunavut*
Abstract from Pan-Arctic Results Workshop – Ottawa, Feb 7-10, 2011

This research examined how climate change can affect Inuit women's food security in Igloolik. It drew on a mixed methods approach, including semi-structured interviews with 36 women, focus groups with 19 women, and interviews with local and territorial health professionals and policy makers. Results showed a high prevalence of food insecurity, with 76% of women skipping or reducing the size of their meals in 2008, and 40% reporting that they were not eating enough food when supplies ran out. Multiple determinants of food insecurity were identified, including issues surrounding affordability and budgeting, knowledge, education, preferences, quality and availability, absence of a full time hunter in the household, and the cost of harvesting. These determinants are operating in the context of changing livelihoods, addiction, poverty, and climate related stresses, which in many cases exacerbate food insecurity.



Arviat, Nunavut

COMMUNITY PROFILE

Location: Nunavut
2011 Census Population: 2318
Land Area (square km): 132.07
Website: <http://www.arviat.ca/>

PROJECT INFORMATION

Title: "Determinants of Food Security among Inuit Women in Arviat, Nunavut: the role of climate change and multiple socio-economic stresses"
Year(s) Funded: 2010-2011

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Title: "Determinants of Food Security among Inuit Women in Arviat, Nunavut: the role of climate change and multiple socio-economic stresses"

Community History – The History of Our People

Arviat (formally called Eskimo Point) is the southernmost community on the Nunavut mainland (61°06N, 94°03W) located on the western coast of the Hudson Bay (Figure 1). The last census reported a population of 2,060 people (93% Inuit) living in Arviat (Statistics Canada 2007). For the past 30 years, it has had one of the highest per capita birth rates in Canada with an average of 60-70 births per year (data available at the Arviat Health Centre, 2009). Inuit habitants of Arviat are named "Arviarmiut". They come from different groups of "Caribou Eskimo", inland-dwelling Inuit of the Barren Lands in the Keewatin region (now Kivalliq region in Nunavut).

During the 1950's, the main relocation to settlements occurred, which was triggered by the collapse of the fur trade. By 1960, almost all Caribou Eskimos were relocated to settlements with the majority of Qaernermiut and Pâdlimiut located at Eskimo Point (Arviat). This relocation gave rise to a myriad of cultural and socio-economic changes among the Caribou Eskimo population, and across the Canadian Arctic.



Arviat remains a traditional community where hunting is an important activity for diet, cultural identity and local economy. Inuit commonly hunt and consume caribou, seal, fish, geese, eggs, muktuk and berries which are viewed as core components of the community diet. The community has been regarded as having strong Inuit language and cultural practices which are highly respected by the community as important protective factors in coping with rapid change.

Project Summary – How We Are Leading the Way

The aim of this project was to identify and characterize the vulnerability and adaptability of the Inuit women's food system to climate change in the context of multiple stresses. Photovoice, semi-structured interviews with Inuit women (n=42) and key informants (n=8), focus groups with women (n=4), Elders (n=3) and hunters (n=2) were used to collect in-depth qualitative data.

- Key findings show that the food system of women is affected by environmental (climatic and biophysical) variability. Arviarmiut did not associate change in caribou migration pathway and increases in polar and grizzly bear populations with climate change, but rather with natural cycles.
- Currently, multiple human and historical factors play a predominant role in determining the food security status of women:
 - Financial resources and budgeting skills;
 - Store food knowledge;
 - Decreases in the transmission of country food knowledge;
 - Decreases in traditional training;
 - Substance use and gambling;
 - High cost of living; and
 - Presence of a spouse as single women are particularly at risk of being food insecure as they are economically disadvantaged.
- While climate change was not identified as an important stressor on the food system by interviewees, when participant observations are placed in conversation with scientific literature on climate change there are clear linkages between climate change and food security for women in the Canadian Arctic.

Capacity Building – Connecting the Guidance of the Past with the Needs of Today

Photovoice, interviews and focus groups - These increased awareness amongst the participants about food security issues and provided them with opportunities to reflect, discuss and consider their situation and potential solutions.

Engaging discussion - By engaging with women in talking about food security, we hope to have increased their consciousness about certain aspects such as food purchasing decisions, the importance of country food in a healthy diet, the potential impacts of climate change and increased their interest in money management.

Developing local research capacity - Two research assistants were trained to accomplish various research tasks: photovoice, interviews, focus groups discussion, transcription, dissemination of results through local radio shows and national conferences. They worked with this research project and also on several others going on in the community at the time.



Next Steps – How We Are Adapting to Climate Change

The community will work towards addressing some of the recommendations made by the community members and the Arviat Health Committee during this research project.

Key Recommendations

- 1) Offer training on budgeting and money management in Arviat to all community members.
- 2) Offer training on traditional foods led by Elders (value, meaning, how to prepare and cook it) to women and young people.
- 3) Offer cooking classes to learn about both country food and store food and how to mix them, and how to prepare meals that are cost effective.
- 4) Nunavut Child Benefit cheque should be distributed on a bi-monthly basis.
- 5) Nunavut Child Benefit should be provided as cards limited to certain items such as healthy food and gas.
- 6) Increase the number of health professional in Arviat to address pressing issues such as nutrition.
- 7) Continue supporting Hunters and Trappers Organization.
- 8) Increase number of programs supporting children and youth traditional learning and empowering their culture.
- 9) Increase the size of the community freezer where hunters can keep country food for their family and also to share with the community.



White River First Nation, Yukon

COMMUNITY PROFILE

Location: Beaver Creek, Yukon
About 450km from Whitehorse and about 300km away from Haines Junction
INAC 2011 Census Population: 103
2011 Census Land Area (square km): 27.14
Website: <http://www.yukoncommunities.yk.ca/communities/beavercreek/fr/>

CONTACT INFORMATION:

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White River First Nation
General Delivery
Beaver Creek, Yukon Y0B 1A0
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PROJECT INFORMATION:

Title: "To Feed Our Community Project"
Year Funded: 2009-2010
Partners:
Beaver Creek Community Club
Beaver Creek Community Nurse
Beaver Creek RCMP
Nelnah Bessie John School Beaver Creek
Trapper
Home Care/ Community Health Representative
First Nation Wellness Worker
First Nation Chief and Council



Title: "To Feed Our Community Project"

Community History – The History of Our People

Beaver Creek (Lat. 62°23'27"N; Long. 140°53'35"W) is located along the Alaska Highway and is just a few kilometres away from the Alaska border (see map). Beaver Creek is home to about 100 people, half of which are from the White River First Nation. Historically, the area around Beaver Creek was used seasonally by members of the Upper Tanana. In the 1900's, surveyors settled in the area to chart out the Yukon/Alaska border thereby establishing a permanent community, which was also used during the construction of the Alaska Highway in the 1940's (Yukon Communities, 2004).

The total number of the White River First Nation is approximately 220, although many live outside the community of Beaver Creek. The White River First Nation is made up of both the Upper Tanana people of Alaska and the Northern Tutchone people to the south and east. The Upper Tanana traditional area extends deep into the Alaskan interior and into the Yukon's midwestern section. The White River First Nation is one of the 3 First Nations in the Yukon who have not negotiated a land claim or self government agreement.

Project Summary – How We Are Leading the Way

The White River First Nation located in Beaver Creek, Yukon is concerned about potential climate change impacts on our people with respect to food availability and storage. Our community does not have a local food store making us particularly vulnerable to food-related emergencies. This is particularly the case if the Alaska Highway, our main access route and means by which our community is able to access food from outside our community, is closed due to climate change impacts such as flooding, severe storms, road instability because of permafrost melt, a medical quarantine, or for any other reason. Our

reliance on food from outside our community may have significant implications on our health and our ability to eat healthy foods should our food supplies be interrupted.

White River First Nation is interested in exploring options for food storage based on output by existing facilities such as our garden and greenhouse. Further, while much of our community continues to rely on traditional foods such as moose, caribou, fish, berries, and others, we do not have a community-based means to preserve these or any other foods. We have identified this as an area of vulnerability for our community in terms of being able to provide the community with healthy traditional foods in the off-season, or in difficult times with limited harvest.

Through this project, the White River First Nation aimed to accomplish the following objectives:

Phase I

- Build a food storage facility for emergency use and
- Build a food storage facility for general use (e.g. traditional foods, meat from outfitters, etc.)

Working with community

- 1) To work with the community of Beaver Creek to determine the desire to develop two storage facilities for food: one for general storage (e.g. for traditional foods, meat from outfitters, etc.) and one for emergency-based storage. Community interviews will also take place to determine historic methods for traditional food storage.
- 2) Given a positive response by community members, to build these storage facilities using a culvert storage system.
- 3) To work with our existing greenhouse to determine the possibility of preserving fresh fruits and vegetables for our storage facility.

Phase II

The second phase of this project, whose funding will come from a source external to Health Canada, which will take place in 2011-2012 is to house the storage facilities with freezers for use in warmer months.



Capacity Building – Connecting the Guidance of the Past with the Needs of Today

We aimed to provide our community members with work in educational and constructive projects that increase their knowledge about food security and climate change. There's no better way to do this than to start in our own backyard with our own traditional knowledge holders.

The *long-term objectives* of this project include:

- Increase the self sufficiency of the community of Beaver Creek by providing a means by which the community can store foods both seasonally and in case of an emergency.
- To work with community members to increase their knowledge about future climate change impacts.
- To promote relationships in the community by introducing a community freezer.

Next Steps – How We Are Adapting to Climate Change

Due to unforeseen challenges, phase I was unable to be fully completed, however, we are continuing with the completion of the “Feed our Community Project” by seeking additional resources from the Community Development funding program.

Lessons Learned

- All was not wasted. What came out of this project was the ability to build capacity and we learnt a more efficient way of how to proceed with digging the construction foundation for the food storage structure.
- Gained self assurance and a belief in our ability to succeed in the future.



photo: Spencer, David, public domain

Fort Severn First Nation, Ontario

COMMUNITY PROFILE

Location: Ontario - near the Hudson Bay Coast 725 km north of Sioux Lookout,
2011 Census Population: 334, 2011 Census Area (Sq km): 44.09
855 km north of Thunder Bay, 690 km northeast of Red Lake and 920 km northeast
of Winnipeg.
Population: 494
Land Area (hectares): 3959
Website: <http://fortsevern.firstnation.ca/>

CONTACT INFORMATION:

Applicant: Keewaytinook Okimakanak
Name of project leader: Chief Matthew
Kakekaspan
Affiliation: Fort Severn FN Chief
Address: 216 Algoma St. S. Thunder Bay,
ON P7B 3C2

PROJECT INFORMATION:

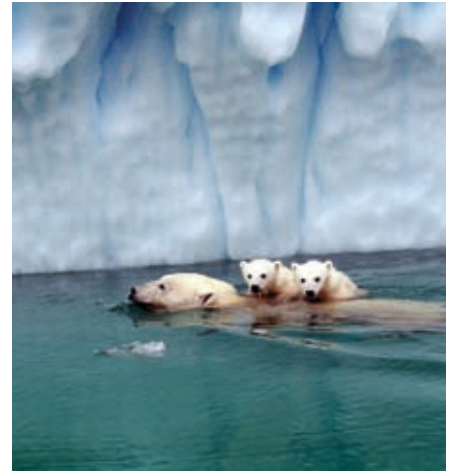
Title: "Community Youth Researchers Survey on Polar Bear and Caribou:
The Changing Way of Life in Fort Severn First Nation"
Year Funded: 2010-2011



Title: Community Youth Researchers Survey on Polar Bear and Caribou: the changing way of life in Fort Severn First Nation

Abstract from Pan-Arctic Results Workshop – Ottawa, Feb 7-10, 2011

The community of Fort Severn First Nation is conducting a survey of polar bear migration and habitat in their traditional territory. Local guides, youth and Elders are working with researchers to collect, analyze, and share local cultural and traditional knowledge, in order to better understand how the species is being affected by climate change. Activities include open community meetings, elder/youth interviews, and youth wilderness and traditional teaching trips. Elders are talking with youth about the land and the changes they see. The youth are learning to make videos and share the stories with others for generations to come.



Nisga'a, B.C

COMMUNITY PROFILE

Location: British Columbia
Population: 6000
Land Area (square km): 1,946.27
Website: <http://www.nisgaalisims.ca/welcome>

PROJECT INFORMATION:

Title: "Nisga'a Women's Health Foods, Shelter and Education in the Mountainous Permafrost"
Year Funded: 2010-2011

CONTACT INFORMATION:

Nancy Mackin, Deanna Nyce
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Nisga'a, B.C.

Title: "Nisga'a Women's Health Foods, Shelter and Education in the Mountainous Permafrost"

Community History – The History of Our People

"We are Nisga'a, People of the Nass River. We have lived here, on British Columbia's northwest coast, since time immemorial. Long enough to see our culture thrive, adapt, and endure" (from Nisga'a website <http://www.nisgaalisims.ca/?q=welcome>) (Reference: Calder 1993: 1). Nisga'a lands stretch from the glacial headwaters to the estuary of the Nass River. This research takes place within the glacial headwaters and the high mountain regions bordering the Nass River which are continuous permafrost areas.

"For more than 10,000 years, we have thrived in this land, organizing ourselves into four clans: Gisk'ahaast (Killer Whale), Laxgibuu (Wolf), Ganada (Raven) and Laxsgiik (Eagle). Our population now numbers about 6,000. About 2,500 people live in the Nisga'a village of Gingolx, Laxgalts'ap, Gitwinksihlkw, and New Aiyansh. Three thousand five hundred live elsewhere in Canada and around the world.

We still hunt, fish, and trap. But today we are also lawyers, administrators, politicians, priests, teachers, linguists, loggers, commercial fishermen, carvers, dancers, nurses, architects, technicians, and business people" (<http://www.citytel.net/~nisga1/introduction.html>) (Reference: Calder 1993:1). The main activities of the Nisga'a population within the permafrost regions include fishing, hunting, and delivery of health and education programs for young men and women. In the permafrost areas, berry plants such as lowbush cranberries and mountain blueberry are still occasionally collected.

Established in 1993, Wilp Wilxo'oskwahl Nisga'a Institute (WWNI) is a fully accredited university with a new campus in Gitwinksihlkw, British Columbia, a village of about three hundred permanent residents. Wilp Wilxo'oskwahl Nisga'a was built to serve the people - Nisga'a and non-Nisga'a - living in Canada's northern regions. To safeguard and protect Nisga'a language and culture, Wilp Wilxo'oskwahl Nisga'a Institute's core curricula is based on Ayuukhl Nisga'a - the ancient code of laws. WWNI is a member of the University of the Arctic.

Project Summary – How We Are Leading the Way

The geography and area of the Nass Valley alpine tundra are changing. Glaciers in the Nass Valley are visibly retreating as the climate is getting warmer. As glaciers melt, the ice patches change into alpine meadow: the kind of meadow where Nisga'a Elders have for centuries found an abundance of berries and other food plants. Cooled and kept moist by glaciers, these meadows and other components of glacier-influenced watersheds are home to diverse plant and animal species and are a critical place for sustaining biodiversity in British Columbia and elsewhere in Canada. Scientists note that as glaciers melt, they are replaced by these food-rich alpine meadows. From this we might discern that the melting glaciers

in the Nass Valley will initially create larger sites for growing the rich diversity of healthy foods that grow in the moist, glacier-cooled alpine permafrost. In the long term, however, the area of the alpine tundra region in British Columbia is expected to decline dramatically, as much as 90 percent over the next fifty to one-hundred years.

Scientists and oral history alike, report that much of the disappearing alpine tundra may be replaced by subalpine shrublands. Our fieldwork at Lax Bilak, the Nisga'a berry picking grounds in the subalpine demonstrated that the alpine shrubland/wetland ecosystem is also rich in food resources. Places such as Lax Bilak may be critical to ensuring that a range of healthy foods and materials will remain available even as glacial plains become alpine permafrost and then subalpine shrublands, under the influence of accelerating climate change.

If Lax Bilak and other food-producing sites are to remain healthy and abundant, it is important to listen to the traditional ecological knowledge and wisdom of the people who have looked after these lands for countless generations.



Nisga'a Elder Emma Nyce with children



Through our research at Wilp Wilxo'oskwhl Nisga'a Institute, women's knowledge of healthy foods, shelters, and education in the alpine permafrost was actively recorded and communicated across generations. At WWNI, Nisga'a Elders and knowledge-holders are re-introducing women's wisdom to young Nisga'a people, who in turn are gradually restoring the knowledge to active use. The children's day camps and ethnobiology field trips of our research have provided additional opportunities for Elders to share their wisdom about the alpine permafrost and its value to survival.

Capacity Building – Connecting the Guidance of the Past with the Needs of Today

Many Indigenous peoples have dealt with climate changes and associated dangers to health in the past for which this knowledge has been sustained through oral history. By understanding the past and really knowing the ecosystem through oral history and observation, First Nations and Inuit communities are able to handle the change in the future. Communities not only need to know this information: they also need the means to pass oral history and experience on to future generations. Communities can ask themselves: how did we manage change in the past and how can this information guide our actions in the future? More research and communication within and among communities are needed to understand climate and landscape changes and their impacts on the health of people and our lands.

Next Steps – How We Are Adapting to Climate Change

In the Nass Valley, traditional ecological knowledge about surviving during times of change is taught and overseen by Nisga'a knowledge-holders, Elders, and other leaders. This knowledge, and the leadership that sustains it, has direct health benefits during times of climate change. Nisga'a knowledge is important for managing food resources, understanding all of the signals relating to timing of harvest and abundance of plant and animal foods, understanding the materials needed to process foods safely and economically. When Nisga'a people practice traditional knowledge, there are indirect health benefits too: we get more exercise! Looking to our Elders for guidance in traditional foods is key. Sometimes it helps to access scientific knowledge to show our young people how valuable Elders' wisdom can be: for example, nutritional analysis demonstrates to young people that community knowledge-holders understood the intricate interrelationships among food, health, and climate.



Teslin, Yukon

COMMUNITY PROFILE

Location: Yukon
2011 Census Population: 122
2006 Census Land Area (square km): 1.92
Website: <http://www.teslin.ca/>

PROJECT INFORMATION:

Title: "Food Security and Climate Change: Teslin Tlingit Research Food Security and Climate Change Health Impacts in Our Community"
Year Funded: 2010-2011

PARTNERS:

Teslin Renewable Resource Council
Bernice Schonewille
TTC Heritage Department
Clifford Evans
Arctic Health Research Network-Yukon
Jody Butler Walker (Executive Director) & Norma Kassi (Associate Director)
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Dr. Laurie Chan

CONTACT INFORMATION:

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*Title: "Food Security and Climate Change:
Teslin Tlingit Research Food Security and Climate Change
Health Impacts in Our Community"*

The History of Our People – Teslin Tlingit

Teslin is located in south-central Yukon in Northern Canada and is home to approximately 480 people of which two-thirds are Inland Tlingit. The name Teslin is derived from the Tlingit word 'tas t'en' or 'long sewing sinew' which refers to the 148 km Teslin Lake that surrounds the community's southern border. Teslin Tlingit are descendants from the Taku Qwan who moved inland in the 18th century.

Teslin Tlingit culture includes five clans: Kukhhittan (Raven); Ishkitan (Frog); Yanyedi (Wolf); Deshitan (Beaver); and Dakhlawedi (Eagle). The clan system continues to have an important and integral role in Teslin Tlingit society and their political traditions (Teslin Tlingit Council 2009).



Why Research Traditional Foods?

For Teslin Tlingit, traditional foods are central to cultural health and well-being. Over thousands of years, Aboriginal peoples in the north have adapted to a food system that is based on northern populations such as moose, caribou, fish, small games, berries and medicines. Chronic diseases are increasing, which the Tlingit believe strongly is a result of not being able to practice our traditional activities and harvesting on the land/water, resulting in greater reliance on market foods and a change in diet.

It is the youth and future generations who will be facing the greatest impacts of climate change in the coming years, and they will be responsible for adapting to the changes. It is essential to focus attention on building capacity and knowledge on climate change with the youth to have a greater understanding of our perceptions of climate change and food security, and increase our capacity to do research and take action on climate change/other environmental health issues.

Project Summary – How We Are Leading the Way

This research is linked to the health of the Teslin Tlingit People because traditional food sources are essential to our health and well-being. The Teslin Tlingit Council (TTC) is currently developing a Strategic Plan and environment was one of the top five priorities. The information resulting from this project will contribute to the Strategic Plan as well as the future development of a climate change food security plan for the region.

The work of this project has been done by the citizens of Teslin, coordinated by the Health and Social Department and Education Department of the Teslin Tlingit Council. Over the course of the summer, five Teslin Tlingit youth were hired to conduct interviews with TTC citizens and trained in filmmaking. The project has been an important opportunity for the Youth and the Teslin Community to become engaged with western science and traditional knowledge and to learn about and understand the current circumstances related to climate change and health, and how that relates to developing strategies and solutions to deal with the long-term health of the Teslin Tlingit Community.



Teslin Tlingit Citizen Wisdom

Here are several key topics that TTC citizens considered important when talking about climate change and health:

Land and Water; Land & Water Protection; Gardening; Harvesting off the Land; Berry Harvesting; Hunting and Fishing; Decline of Traditional Foods; Identity and Culture; Preparing for Hard Times; and Climate Change and a Changing World.

Resources Developed

- Fifteen minute film entitled “Teslin’s Voice”
- PowerPoint presentations
- Photos
- Community Summary Report
- Five youth trained in film production

Capacity Building – Connecting the Guidance of the Past with the Needs of Today

This project strived to:

- Prepare Teslin Tlingit future leaders to make decisions that involve planning for both the management of decreased wildlife populations and the subsequent impacts on food security as well as preserving the Tlingit culture in light of a rapidly changing environment;
- Teach Teslin Tlingit youth and others about healthy foods and food security;
- Teach youth about project design and implementation, how to conduct interviews, filming, and development of writing and presentation skills;
- Facilitate discussion and support the community in the future planning of adaptation actions in the face a changing environment; and
- Build capacity in the community of Teslin in researching skills and on taking actions regarding climate change and health impacts



Tr'ondëk Hwëch'in, Yukon

COMMUNITY PROFILE

Location: Yukon
2009 Population: 1067
Land Area (square km): 65,000 square kilometers in west-central Yukon.
Website: <http://www.trondek.ca/>

PROJECT INFORMATION:

Title: "A Multi-disciplinary Investigation of Climate Change Impacts on Yukon River Traditional Foods and the Implications for Health and Tr'ondëk Hwëch'in River Culture and Lifestyle"
Year Funded: 2010-2011

CONTACT INFORMATION:

Name of project leader: Bill Kendrick
Affiliation: Tr'ondëk Hwëch'in
Address: Box 599
Email: bill.kendrick@gov.trondek.com



Title: A Multi-disciplinary Investigation of Climate Change Impacts on Yukon River Traditional Foods and the Implications for Health and Tr'ondëk Hwëch'in River Culture and Lifestyle

Abstract from Pan-Arctic Results Workshop – Ottawa, Feb 7-10, 2011

The primary focus of this project was to increase the understanding of climate change and its impacts along the Yukon River within Tr'ondëk Hwëch'in Traditional Territory (THTT), and the associated health implications for the community. The project addressed irregular water conditions and the impact on traditional food security, with a focus on salmon and river plants, for example, wild onion. Results provide baseline information for the Yukon River Watershed to inform adaptation strategies, reinvigorate community interaction with the river and encourage knowledge transfer between Elders, scientists and youth.



Land Erosion

and Land Use

“Land is therapeutic as it is intertwined socially, economically, spiritually, and biologically to human health” (Gesler 1992; Gesler 1993; Williams 1998)

Human life would not be sustainable without fertile lands producing the necessary foods we eat and hosting the organic and inorganic materials used for shelter, tools, and medicines. Canada’s total area is 9,984,670 km² where 9,093,507 km² or about 91% of it is land and 8% is freshwater (Natural Resources Canada, 2005). It is used for agriculture, hunting and gathering, travel routes, tourism, resource extractions, and leisure. Land is therapeutic as it is intertwined socially, economically, spiritually, and biologically to human health (Gesler 1992; Gesler 1993; Williams 1998).

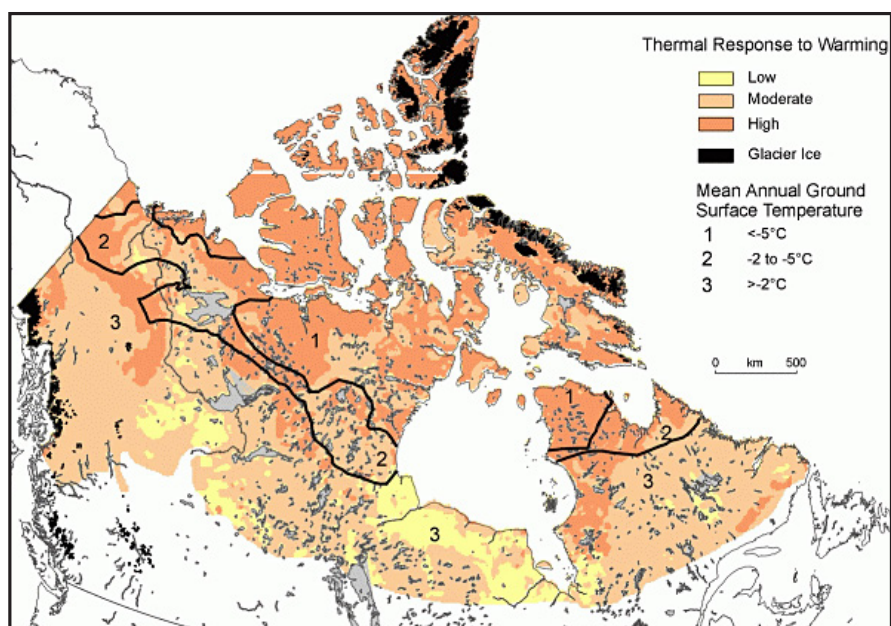


Figure 1. Natural Resources Canada. Susceptibility of permafrost regions to warming temperatures.



Scientists are engaged in research to further understanding of the impacts that climate-induced erosion has on land and its uses. Natural Resources Canada estimates that the continuous rise in atmospheric CO₂ concentrations, due to human sources, may increase the temperature by several degrees over much of the Arctic. Permafrost regions can be high, moderate, or low susceptible to thawing within a 1-2 degree temperature increase (see Figure 1). 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.

Health Canada's Climate Change and Health Adaptation Program supported two community-led projects on land erosion, land use and health. Northern communities recognize that these changes 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 on land use and erosion, and how they are adapting to these changes to ensure the health and well-being of their communities.



Little Salmon /Carmacks First Nation, Yukon

COMMUNITY PROFILE

Location: Yukon
2011 Census Population: 503
Land Area (square km): 36.95

Project Information:

Title: "Little Salmon/Carmacks First Nation Traditional Land Use Health Study"
Year Funded: 2010-2011

CONTACT INFORMATION:

Michael Vance, Director, Nan, Nena Dan Do K'anete
(Lands, Resources and Heritage)

E-mail: mike.vance@lscfn.ca

Trudy Tom, Director, Dane Dan Do K'anete (Finance)

Address: Box 135, Carmacks, Yukon, Y0B 1C0

Telephone: (867) 863-5576

E-mail: trudy.tom@lscfn.ca

Christopher J. Alway

grayston@northwestel.net



*Title: "Little Salmon /Carmacks First Nation
Traditional Land Use Health Study"*

Community History – The History of Our People

Located in Carmacks, Yukon, in northern Canada, the Little Salmon/Carmacks First Nation (LSCFN) is one of 14 Yukon First Nations. We have a membership of approximately 630 people including status and non-status beneficiaries. LSCFN is a self-governing First Nation in the Yukon. Over the last 10 years, efforts have been made in the community of Carmacks and in LSCFN Traditional Territory to move forward with building sustainable and responsible government.

Some have succeeded, and some have failed. The failures, in many ways came down to a lack of capacity caused by damage to several generations of our people as we transitioned from a life lived on the land to a European based way of life. Our Elders and citizens have told us that we need to find a blend of Traditional Governance and contemporary governance requirements that will find a new way forward towards a healthier community.

Project Summary – How We Are Leading the Way

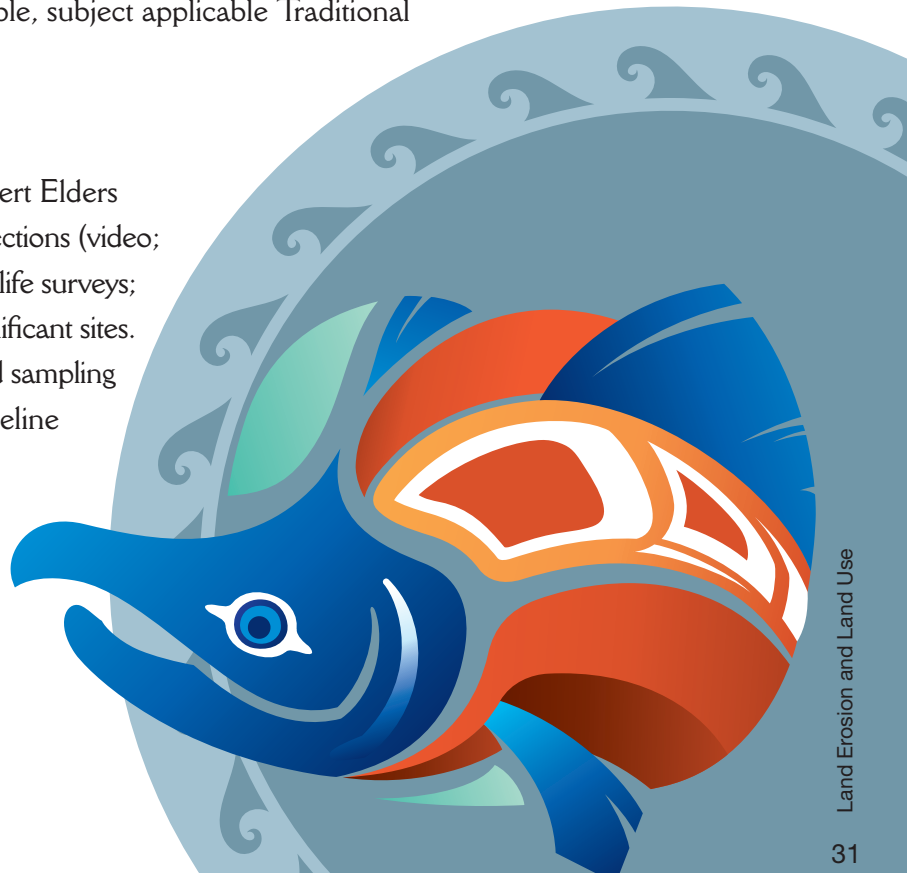
Little Salmon/Carmacks First Nation over the last ten years has been gathering Traditional Governance knowledge from Northern Tutchone Elders to ensure as much knowledge is preserved as possible. The focus up to this point has been on the traditional use of fish, wildlife and the land. Traditional Governance influenced every part of life for Northern Tutchone people. It is hoped that the continued focus in this project, and others, on gathering Traditional Knowledge from Northern Tutchone Elders to help find a blend of contemporary and traditional knowledge that will allow our people to move forward to a healthier life and ensure the guidance of our past generations is recorded and honoured.

This project was made up of two components:

- 1) Food Safety and Security and Health Adaptation to Climate Change Effects
 - I. Nutritional Testing: Little Salmon/Carmacks First Nation (LSCFN) has owned and operated a greenhouse and potato farm for just over 11 years. The vegetables produced provide a safe, locally grown, healthy food supply for the local residents and Citizens of LSCFN. Vegetables are given free to Elders, those with cancer, diabetes, and to single and nursing mothers in order to encourage healthy eating habits. The LSCFN were interested in conducting nutritional testing on all vegetables produced to be made aware of the quality of their locally grown greenhouse foods. On the advice of Yukon Territorial Government (YTG) Agriculture Branch staff, LSCFN decided to go ahead with its own test on LSCFN greenhouse raised tomatoes versus BC greenhouse tomatoes bought at a Whitehorse store.
 - II. The test results proved that LSCFN grown tomatoes are comparable in nutritional value and quality. The biggest difference is the fact that LSCFN grown tomatoes produce little or no greenhouse gas emissions and are a safe, reliable, local, organic, nutritional food source.
- 2) Understanding Effects of Climate Change and Capacity Building
 - I. The second part of Climate Change and Health Adaptation in Northern First Nations and Inuit Communities funding was used to support Traditional and Scientific assessment of the Big Salmon Village site at Big Salmon, Yukon. Fieldwork was conducted to assess the current status of plants, animals, soil and water at the old village of Big Salmon, Yukon. LSCFN River Crews were taught how to conduct terrestrial and aquatic site assessments.
 - II. No samples were analyzed in this project because of budget limitations. The collection of samples was conducted to provide hands on experience of proper procedure for obtaining baseline environmental information. The scope of this project was to collect data and samples in the field as part of building capacity within LSCFN.

Research Activities - Connecting the Guidance of the Past with the Needs of Today

- Survey and compilation of available, subject applicable Traditional Knowledge research
- Elders meeting
- Nutritional testing
- One-on-one interviews with expert Elders
- River based site investigations/inspections (video; water samples; plant, fish and wildlife surveys; contaminants, etc) of culturally significant sites.
- Hands on training in collection and sampling methods for acquiring proper baseline environmental information.
- Yearly results roll-out meeting to confirm findings with Elders



Selkirk First Nation, Yukon

COMMUNITY PROFILE

Location: Central Yukon
Population: 280
Land Area (square km): N/A
Website: <http://www.selkirkfn.com/>

CONTACT INFORMATION:

N/A

PROJECT INFORMATION:

Title: "A Pilot Study on the Health Effects on the Selkirk First Nation due to Climate Change"
Year Funded: 2008-2009



Title: "A Pilot Study on the Health Effects on the Selkirk First Nation due to Climate Change"

Community History – The History of Our People

The Traditional Territories of the Selkirk First Nation are located in Central Yukon approximately halfway between Whitehorse and Dawson City. Across these lands flow several great rivers – Yukon, Pelly and Stewart – that have determined the settlement of the people across the territory for many millennia. The flow of these rivers has had both symbolic and practical influences on how the people have settled and lived across the ages. One of the first permanent settlements in the Yukon was Fort Selkirk, established at the convergence of the Yukon and Pelly rivers in 1854. The people of Selkirk First Nation (hereafter referred to as 'SFN') came to the rivers every summer to stock up on fish for the long winters. Hunting was also a frequent and necessary activity then as it is now. Rivers have always provided a key source of food to the people of Selkirk and herein lies the focus of this project.





Project Summary – How We Are Leading the Way

Climate change is occurring in the Traditional Territory and the people of SFN are unsure about the effect it is having on them. The critical issue for SFN is what effect climate change may be having on the ecosystems from which they derive their food and water supplies.

One of the effects of climate change may be an increased incidence of landslides occurring near the rivers and tributaries that flow through the Traditional Territories (TT). The questions that people ask are:

- How will climate change affect our way of living?
- Are landslides caused by climate change, and if they are, will there be more landslides in the near future?
- How do landslides affect our water, the fish, and the terrestrial food supply from which we get our sustenance?
- What are the potential commodities which may enter the watershed area?

A detailed scientific study of this topic that may provide answers was well beyond the scope of this pilot project. However anecdotal information gathered from the Elders was sought to provide a base for further study.

The methodology to get the required information was to:

- perform a face-to-face survey of Elders across the Selkirk First Nation,
 - A series of questions were asked to Elders for historical information about landslide activity in the SFN TT, and any resulting health effects from these landslides
- interview scientists familiar with landslides to get their opinions on these topics as they relate to the SFN TT, and
- do a survey of satellite imagery to document landslides on the major rivers in the study area that would update a 2006 study.

Knowledge Sharing -

Education / Awareness / Promotion

*“Education is a powerful tool that builds capacity within community...
(Battiste, M. 2002)”*

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, to create awareness, and to promote knowledge that is meaningful.



Education is a powerful tool that builds capacity within community (Battiste, M. 2002). 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).

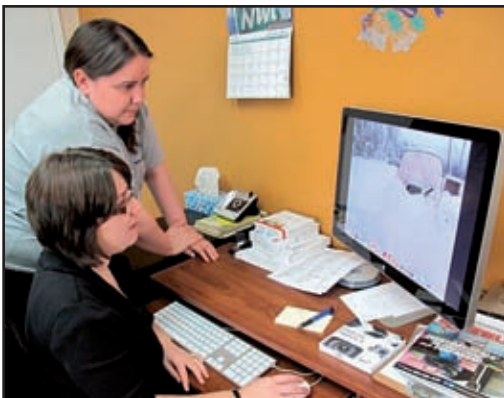


Sheila Watt-Cloutier, acclaimed Inuk climate change advocate and Nobel Prize nominee, considers being out on the land an intimate learning experience where:

“The 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,” she says. “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.”

- Sheila Watt-Cloutier -

Northern First Nations and Inuit communities made it clear that sharing knowledge, specifically traditional knowledge, is important to them. Thirteen out of 36 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.



Igloolik, Nunavut

COMMUNITY PROFILE

Location: Nunavut
2011 Census Population: 1,454
2011 Census Land Area (square km): 103.01

PROJECT INFORMATION:

Title: "Inuit Knowledge and Climate Change: Assessing, Mitigating, and Communicating Health Risks"
Year Funded: 2009-2010
Area of Research: Education/Awareness/Promotion
Other Communities Involved: Pangnirtung, Resolute Bay, and Iqaluit

CONTACT INFORMATION:

Ian Mauro
Canada Research Chair
in 'human dimensions of
environmental change'
Mount Allison University
Email: imauro@mta.ca



Title: Inuit Knowledge and Climate Change (IKCC): Assessing, Mitigating, and Communicating Health Risks"

Project Summary

The Inuit Knowledge and Climate Change (IKCC) project is a collaboration between Zacharias Kunuk and Isuma Productions (acclaimed Inuit filmmakers of *Atanarjuat The Fast Runner*), Nunavut Independent Television (NITV), Dr. Ian Mauro (an environmental and social scientist, Mount Allison University) and communities across Nunavut. In the spring of 2009, Kunuk, Mauro and their crew conducted 63 climate change interviews with Inuit Elders, hunters, women and youth in Pangnirtung (n = 24), Igloolik (n=15), Resolute Bay (n=10) and Iqaluit (n=6) as well as with climate change scientists (n=6) and other experts (n=2). In each location, the IKCC team conducted extensive community consultations, seeking input and guidance from hamlet and youth councils as well as the local hunter and trapper organizations, and travelled "on the land" with local people to document climate change. This approach ensured that outcomes were community-based and increased the legitimacy and impact of the overall project and associated film.

Project Goal

The overall goal of the project was to develop multimedia research and education tools that promote Inuit knowledge and climate change in collaboration with Nunavut based communities. Multimedia research tools were developed that explored the following topics:

- community and environmental health;
- wildlife management regarding polar bears and seals;
- adaptation planning related to environmental change; and
- public policy regarding Canada's north and its people.

The final outcome of the project is the feature-length film *Qapirangajuq: Inuit Knowledge and Climate Change* (www.isuma.tv/ikcc), which is the world's first Inuktitut language feature film on climate change, and the associated project website. Content is continually uploaded to our website and Isuma plans to expand it as a tool to explore topics in the film.

Health and Adaptation

A major focus of this project related to climate change and associated health issues. The IKCC team interviewed Elders and hunters, scientists, as well as community public health nurses about the health-related aspects of climate change.

Some Key Concerns

- Unpredictable weather was viewed as a major threat to physical and cultural wellbeing.
- Numerous Elders and hunters spoke about how climate change is affecting the health and quality of animals and associated country foods, such as seal, caribou and whale.
- Participants were concerned that melting permafrost might adversely affect their communities.
- Interviewees were concerned about changes in the increased temperature and intensity of the sun.

Positive Outlook

- Despite many of these challenges, most participants were quick to point out that Inuit are a highly adaptable people, and that they have survived past climate change events.
- Many locals spoke about potential benefits associated with climate change, such as less extreme winter temperatures, increased time for boating in summer and influxes of new and edible species.

Discovery

Numerous Elders, geographically distributed across Nunavut, observed that the positions of the sun, moon, and stars had shifted and concluded that the “earth had tilted”. The IKCC team considered these observations seriously and interviewed scientists to see if scientific evidence existed on this topic. Waldermar Lehn, an expert in atmospheric refraction indicated that climate change is likely warming the upper atmosphere and this air is colliding with cold surface temperatures to create an “inversion” ideal for refraction. According to Lehn, when these inversions occur they can bend light, similar to a prism, and this can change the position of the sun, moon and stars, especially near the surface of the earth. Indeed, Elders’ observations of a “tilted earth” are likely evidence of a warming world, which is altering the “visual landscape” of the Arctic. Peer reviewed publications on this topic are forthcoming.

Video training courses for youth



FIGURE 1: The IKCC project carried out “youth outreach and training” in the focus communities. Youth researchers were trained in video and photography techniques (left- and right-handed) and our team gave school workshops about the importance of Inuit knowledge and climate change (Centre)

Building Capacity

- Youth-focused training has had a major impact in participating communities, increasing awareness about climate change, while offering young Inuit tangible video skills and opportunities for cultural expression.
- *Offering local high-speed intranet access to IsumaTV at local high schools and other facilities in participating communities.*

Research Implications – Proposed Research Model

The IKCC project, conducted entirely in Inuktitut and using video technology to record Inuit knowledge is a model for how to respectfully carry out research in indigenous communities. Elders and hunters immediately recognized the importance of the video-based approach, given that it visually credited them with the knowledge being shared, but also allowed for widespread communication of this information. Participants in this project felt respected and trusted the IKCC team, given that it was largely comprised of fellow Inuit. Arguably, the strength of the IKCC approach was based on partnerships between academic and community-based researchers and the insightful participants they interacted with. This allowed for a co-production of knowledge, between the research team and communities, and ensured that Inuit were involved in decision-making regarding the project and its outcomes throughout the process.

Next Steps

The film continues to be screened around the world. Notable screenings include:

- *Congress of Social Sciences and Humanities, Fredericton, UNB, May 31, 2011.*
- *Opening Night Film of Smithsonian Institutions Indigenous environmental film Festival in New York City, March 30, 2011.*
- *Closing film of Environmental Film Festival, Washington DC, March 27th, 2011.*
- *ArcticNet Annual Meeting, Ottawa Ontario, December 15, 2010.*
- *Screening for Canadian Parliamentarians, Ottawa, Ontario, November 24, 2010.*
- *University of Winnipeg's Arctic Summit, Winnipeg, Manitoba, November 9, 2010.*
- *ImagineNative Film and Media Arts Festival, Toronto, Ontario, October 23, 2010.*

Kunuk and Mauro have taken the film on a tour of Atlantic Canada in February, 2012. They have also presented the outcomes of the film at the International Polar Year (IPY) 2012 conference in Montreal, April 22-27, 2012.

ATLANTIC CANADA PREMIERE
with Zacharias Kunuk

QAPIRANGAJUQ:
Inuit Knowledge and Climate Change

Nunavut-based director Zacharias Kunuk (*Atanarjuat The Fast Runner*) and researcher and filmmaker Dr. Ian Mauro (*Seeds of Change*) have teamed up with Inuit communities to document their knowledge and experience regarding climate change. This new documentary, the world's first Inuktitut language film on the topic, takes the viewer "on the land" with elders and hunters to explore the social and ecological impacts of a warming Arctic. This unforgettable film helps us to appreciate Inuit culture and expertise regarding environmental change and indigenous ways of adapting to it.

Mount Allison University
ISUMA
Centre for International Studies
Canada
New Brunswick Filmmakers' Co-operative
Chama

FEBRUARY 6TH
7:00 - 9:00 PM
Vogue Cinema, Sackville, New Brunswick
Live Q and A with co-directors
*This event is free and open to the public

For more information contact Christl Verduyn: cverduyn@mta.ca or Ian Mauro: imauro@mta.ca

Rigolet, Nunatsiavut

COMMUNITY PROFILE

Location: Nunatsiavut
2011 Census Population: 306
2011 Census Land Area (square km): 3.61
Web: <http://www.townofrigolet.com/home>

PROJECT(S) INFORMATION:

1 “Changing Climate, Changing Health, Changing Stories: a capacity development approach to community-based participatory health research in Nunatsiavut, Canada”
Year Funded: 2009-2010
Area of Research: Education/Awareness/Promotion

2 “Changing Climate, Changing Health, Changing Stories 2: uniting Nunatsiavut Youth and Elders through stories, community-based research, and wisdom”
Year Funded: 2010-2011
Area of Research: Education/Awareness/Promotion

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The My Word Team (Tanya Pottle, Dina Wolfrey, and
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Rigolet, Nunatsiavut, my.word.rigolet@gmail.com



Titles:

1 “*Changing Climate, Changing Health, Changing Stories: a capacity development approach to community-based participatory health research in Nunatsiavut, Canada*”

2 “*Changing Climate, Changing Health, Changing Stories 2: uniting Nunatsiavut Youth and Elders through stories, community-based research, and wisdom*”

Community Profile - The History of Rigolet, Nunatsiavut

Rigolet (population 290, 95% identify as Aboriginal) is one of the Southern-most Inuit community in the world, and is situated within the Nunatsiavut region of northern Labrador, the newest Inuit region in Canada (est. 2005). Rich in land and sea life, Rigolet enjoys harvesting the abundance in the area: salmon, char, trout, seals, wild berries, and medicinal plants. Rigolet is also teeming with minke whales, diverse seabird colonies, migratory birds, black bears, polar bears, foxes, martins, wolves, lynx, beavers, and sometimes caribou. In the 18th Century, Hamilton Inlet became host to European explorers and traders, and in 1743 Louis Fornel landed near the present day Rigolet and established Rigolet’s first trading post. Many of the families in Rigolet are descendants of the European settlers and Nunatsiavut Inuit. Today, hunting and fishing are done mainly for food and not trade. However, seal hunting is still done commercially, and professional trapping has survived on a small level. Rigolet is an active community with a 4.4 km boardwalk along the shore, an annual three-day Salmon Festival, dog team races and carnivals, snowmobiling, ice fishing, and the Tikkiaksausugusik Cultural Festival (see www.rigolet.ca).



Project Summary - How We Are Leading the Way

Believing in the importance of taking control of the research process and of ensuring that the community is prepared to meet the challenges of a changing climate and environment, Rigolet has been very proactive with research projects in recent years. In 2009, the Rigolet Inuit Community Government received funding through the Climate Change and Health Adaptation Program for Northern First Nations and Inuit Communities to study the impacts of climate change on physical, mental, and emotional health and well-being in the community – and the *Changing Climate, Changing Health, Changing Stories* project was created! This project was dedicated to piloting the use of digital storytelling as a health data-gathering strategy, a health communication platform, and a capacity-building approach, and combined this technology with qualitative methods (e.g. in-depth interviews, surveys, focus groups, PhotoVoice).

In addition, this project also established Canada's first Inuit-run centre for research and multimedia methods: the 'My Word Storytelling and Digital Media Lab'. This community-run lab has 10 Macbooks, eight digital cameras, a digital video camera, a Mac computer, two iPads, and all the required editing and media technology. This equipment is not only available to community members in Rigolet, the 'My Word' Lab is also able to travel to other communities to conduct digital storytelling workshops, train other communities in digital storytelling techniques, conduct research, and train others in research design and delivery. Finally, it is important to note that this project was conducted by a transdisciplinary team of Inuit and non-Inuit researchers from a variety of backgrounds and training, which further enhanced the effectiveness of the project and the overall results, and the relationship between the project and the community.

Highlight of Activities

Research & Output Activities (as of March 2011)

- 85 in-depth interviews
- 2 surveys (n=75 questionnaires; 112 questionnaires)
- 8 focus groups
- 3 PhotoVoice workshops
- 7 journal articles written (1 published, 2 forthcoming, 4 under review), 2 in preparation
- 40 conference presentations (8 under review)

Digital Storytelling and PhotoVoice Activities

- 35 digital stories created <http://www.townofrigolet.com/home/stories.htm>
- 7 community workshops and 1 youth workshop conducted
- 1 Youth and Elder Summer story-sharing summer camp
- 2 DVDs of stories created & disseminated to all community members
- 2 websites created to share the stories: Facebook and YouTube
- 10 story nights held in the community
- A photo book and a calendar created to highlight the photographs
- 6 community members trained in digital storytelling facilitation

Capacity Building – Connecting the Guidance of the Past with the Needs of Today

Community capacity building and training in research, technology-based, story creation, and facilitation skills have been the cornerstone of the Changing Climate project from its creation. Since the project started in 2009, it has provided training opportunities to community members in a number of areas:

1. Training in computer technology, editing, and story design and creation through the digital storytelling workshops (open to all interested community members);

2. Training in photography skills, digital camera usage, and photograph composition and style (open to all interested community members);
3. Training in research assistantship (3 community members, hired through competitive process); and
4. In-depth training in facilitation, workshop planning, digital storytelling and PhotoVoice, counselling referrals and self-care, working with people, professional writing, presentation skills, and business skills (6 people through the 'My Word' Lab hired through a competitive process).

In addition, community members from all ages and backgrounds had the opportunity to share stories and listen to the stories of others. This sharing of wisdom through stories and between generations was essential to providing the opportunity for land-based knowledge to be shared, celebrated, remembered, and mobilized in the current time.

Next Steps –How We Are Adapting to Climate Change

Continuing on with a proactive approach to research, the Rigolet Inuit Community Government and the 'My Word' Lab are continuing to actively host and direct research in the community. Currently, in partnership with the Indigenous Health and Adaptation to Climate Change (IHACC) project, a 5-year research project is being conducted to examine climate change impacts on food security and water quality and safety, as well as develop and implement community-based pilot adaptation strategies. Through funding from the Nasivvik Centre for Inuit Health and Changing Environments, a project to further analyze gender-related climate-health themes emergent from the Changing Climate project is scheduled for 2012. Plans for a regional climate-related mental health and adaptation research project are also currently underway with the Rigolet Inuit Community Government as the project leads.

Throughout all of these projects, community capacity building, meaningful inclusion of community members, and continual results-sharing and community feedback is integral to all stages of the research. This continued engagement with research and the findings from these projects will continue to support Rigolet in creating adaptation strategies and enhancing adaptive capacities in the community.

Summary

The Changing Climate, Changing Health, Changing Stories project, and the community of Rigolet, Nunatsiavut, stand at the forefront of community-directed and community-run research. Through this innovative project, Rigolet has become a leader in the climate-health research field, the 'My Word' Lab has become an exemplar for community-led research initiatives, and the research emergent from this project is breaking new ground and expanding and enhancing the climate-health field within Canada and internationally. Without the funding from the Climate Change and Health Adaptation Program in Northern First Nations and Inuit Communities, this project, the 'My Word' Lab, the ground-breaking research, the community capacity-building opportunities, the training and development received, and the relationships developed would not have been possible!



Déline First Nations, NWT

COMMUNITY PROFILE

Location: Northwest Territories
2011 Census Population: 472
2011 Census Land Area (square km): 79.44

PROJECT INFORMATION:

Title: Health Risk and Climate Change in Sahtúot'ine Stories: Envisioning Adaptions with Elders and Youth in Déline, NWT
Year Funded: 2009-2010
Area of Research: Education/Awareness/Promotion

CONTACT INFORMATION:

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*Title: Health Risk and Climate Change in Sahtúot'ine Stories:
Envisioning Adaptions with Elders and Youth in Déline, NWT*

Community History – The History of Our People

The Déline First Nation is a Dene community of about 550 on the shores of Sahtú (Great Bear Lake). Our name for ourselves reflects our relationship with the lake – Sahtúot'ine. Guided by the words of the Déline prophet known as ehtséó Ayha, the community has chosen a positive path of renewal and governance following a long history of social and climate change that started with the Port Radium radium-uranium mine on the eastern shore of Great Bear Lake during 1932-1960, and climate change that has been experienced with growing rapidity since 1960.

Recent research shows that an area encompassing Sahtú has experienced the largest warming over the past 50 years of any location in the world. Moreover, the large size of Sahtú interacts with climate change in significant ways (Gyakum et al 2009). Now close to achieving self-government, the Déline First Nation has taken a deliberate and systematic approach to understanding and planning for the impacts of climate change, especially with respect to impacts on health and well-being. During 2009-2010, the community undertook a major health-climate change study to explore how traditions carried in Dene stories shared between Elders and youth are used to identify, analyze and address health risk in the context of climate change. This was part of the larger Déline Knowledge Project research program, *The Words of Our Ancestors Are Our Path to the Future*, initiated in 2006.

Project Summary – How We Are Leading the Way

In the early part of the 1900s, ehtséó Ayha warned of drastic environmental and social changes to come in the future, and the community continues to monitor the truth of those predictions. Our project explored the renewal of storytelling practices in Déline with a focus on elder-youth exchanges about

health and climate change in three contexts: on the land, in the community, and in the school. We wanted to learn how youth might prepare for future leadership in climate change adaptation by taking ownership of their heritage in stories. Our study explored the special skills that youth bring to the representation of stories using new media. We believe that our stories can help to strengthen our relationship with the land, and give new meaning to the skills and knowledge required to maintain good health in a changing environment.

The concepts of “health” and “climate change” do not exist in the Dene language. We wanted to take Dene concepts and knowledge as the starting point in our work. The study gained in strength and support because it was integrated with the ongoing life of the community through a series of both planned and adaptive partnerships and collaborations. We also made sure that community members took ownership of the study through a series of “meta-research” workshops, meetings and presentations where people discussed the study process and validated and analyzed the results. These took place both within the community, and in several events that brought participants into dialogue with others in the North and beyond.

The vehicles for research were performance, and experiential knowledge exchanges. Six key activities took place through the life of the study, with story exchanges at the core of each: a climate history and monitoring project that allowed Elders and youth to engage with climate scientists, considering the new and old skills and knowledge needed for safe travel on the land as the climate changes; a project to establish databases in Dene terminology and stories about health, place and climate/weather; a mapping project to understand the cultural and ecological history of landscape around Sahtú; a series of exchanges on traditional healing and responses to new health risks; the “Sharing Our Stories” project, which explored different ways of sharing and performing stories in the school and in the community in a variety of media (including digital storytelling, radio documentary, and digital mapping); and a project to understand the ongoing strengths in subsistence harvesting as the environment changes (with a focus on trapping and caribou harvesting).

Our study resulted in the scoping of key stories that the Elders feel are important for youth to know and be able to apply in their lives; these were stories of place that span the formation of the landscape by Yamoria, and the more recent history of environmental and social changes wrought by the Port Radium uranium mine. We learned much about youth perspectives on their land and heritage through the stories that they created through the various workshops. We gained an understanding of three new media that might be used to keep the stories alive, including digital storytelling, radio documentary, and digital mapping. And we began to explore the challenges of bringing stories into a policy context in self-government and land stewardship.



Capacity Building – Connecting the Guidance of the Past with the Needs of Today

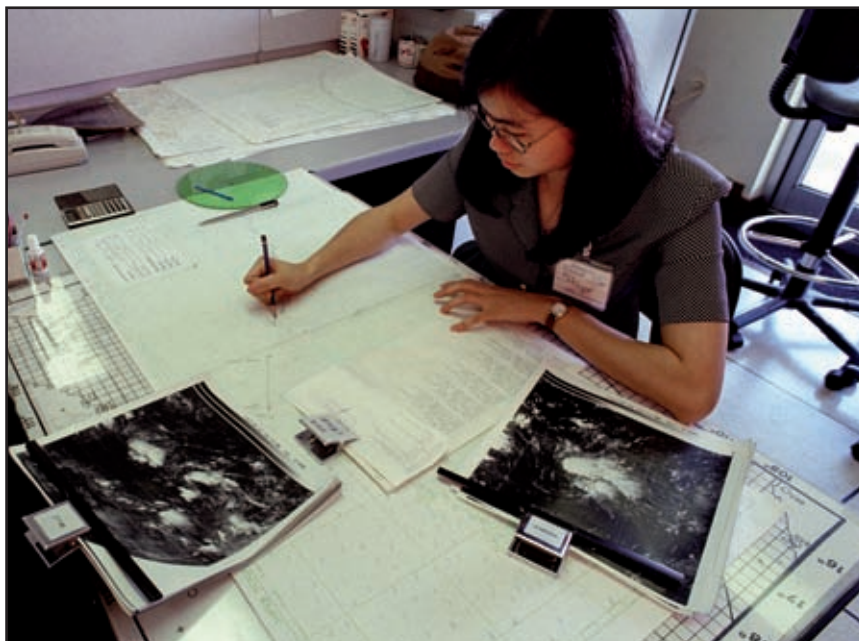
The Déline Learning About Changes study shed light on the complex combination of cultural practices that Sahtúot'ine see positively as our way of life, our basis for well-being. The study opened up new spaces for Elders, adults and youth to start a dialogue about the nature of changes being experienced on the land, and the possible health risks that are coming with these changes. Living in an area with one of the most extreme climates in the world in terms of differences between summer and winter temperatures, the Sahtúot'ine have developed a culture that is highly adaptable. For this reason, our stories, language and survival skills are our greatest strength for moving into a changing future. By involving youth in researching and performing stories, we are helping to develop the knowledgeable leadership that will be needed in the coming years.

Next Steps – How We Are Adapting to Climate Change

The Déline Learning About Changes program in 2009-2010 was just a beginning. The program opened up new spaces for Elders, adults and youth to start a dialogue about the nature of changes being experienced on the land, and the possible impacts of these changes. Our Prophet has spoken about many of the changes that are predicted to take place in our traditional territory, so we know we need to be prepared. We have begun to develop some of the new tools we'll need to keep and use our knowledge and stories, including an archive, place names mapping, and a dictionary. We also need to find new ways to understand our stories as policy in a cross-cultural context. All this work will take a long time.

An important focus must be the maintenance of our relationships within the community, and with the land and animals, in the context of climate change. We are starting to use our stories to teach how to maintain the old practices of respect and sharing, and renew our knowledge about harvesting different animals so that there is always a source of food for the community. It has been very helpful to be able to share experiences with other indigenous communities as well – climate change is global, and we need to learn from not only our own stories, but also the stories of others.

Scientists can also help us to understand how what is happening in our traditional territory fits into global processes. We are also discovering that scientists need to work with us to learn about the specific ecological and health impacts of climate change – their numbers and models don't tell them these things. We need to work together not only to document the stories, but also to keep them alive in the community, in the school and especially on the land – so that we will survive as Dene in the future.



Aklavik, Inuvialuit

COMMUNITY PROFILE

Location: Inuvialuit
2011 Census Population: 633
2011 Census Land Area (square km): 14.47
Website: <http://www.aklavik.ca/>

CONTACT INFORMATION:

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PROJECT INFORMATION:

Title: "Climate as a Health Determinant in the Aklavik region of the Northwest Territories"
Year Funded: 2008-2009
Area of Research: Education/Awareness/Promotion
Partners: Health Canada, Aklavik Health Committee, Moose Kerr School, Institute for Circumpolar Health Research, People of Aklavik and Surrounding Communities



Title: "Climate as a Health Determinant in the Aklavik region of the Northwest Territories"

This project was a youth-driven, community-based project that complemented the 2006-07 Dietary Pilot Project, which was designed to engage Aklavik youth in examining dietary choices and diet-diseases relationships at the community level. The community of Aklavik was engaged in the Climate Change project from many aspects — the Aklavik Health Committee guided the project and community members concerned about community health issues and staff and students of Moose Kerr School were involved through specific curriculum, the on-the-land retreat, as well as the video production. Elders of Aklavik and surrounding area participated by sharing traditional knowledge and applying past events to current understanding and adaptations to climate change. The research was integrated into the science curriculum at the high school.



The project was conducted in three phases. The first encompassed the collection of information related to climate change and health determinants as well as an on-the-land retreat to collect information. The second phase included synthesis of the information with video methodologies. The third phase included dissemination of findings.

“Warmer weather affects the food chain, also the snow that turns into ice and freezes...that gives animals a hard time to get their food underneath the hardened snow.” – Inuvik Elder

A major outcome of the project was a heightened awareness of the research process within the community and region. The project brought together the Elders and youth, and connected western science through the science curriculum and the traditional knowledge of the Inuvialuit and Gwich'in region. The information has been synthesized and discussed on several levels within the classroom. A thirty minute video was produced and premiered in Aklavik on Aboriginal Day (June 21, 2009).



Fort Good Hope, NWT

COMMUNITY PROFILE

Location: Northwest Territories
2011 Census Population: 515
2011 Census Land Area (square km): 47.14

CONTACT INFORMATION:

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PROJECT INFORMATION:

Title: "Our Land, Our Life, Our Future: Community Health, Climate Change & Community Based Adaptation Solutions toward Wellness"
Year Funded: 2008-2009
Area of Research: Education/Awareness/Promotion



Title: "Our Land, Our Life, Our Future: Community Health, Climate Change & Community Based Adaptation Solutions toward Wellness"

Community History – The History of Our People

Fort Good Hope is a community located on the banks of the Deh Cho (Mackenzie River) with a population of 568. The community is predominately a K'asho Gotine Dene community, with Métis, Inuvialuit and Gwich'in community members as well. Fort Good Hope has a rich history of political leadership and cultural activities such as drumming. Fort Good Hope has a large youth population, and due to its remote location, it has limited access to extra – curricular activities, arts, sports and travel. In Fort Good Hope, many people living today were born and raised out on the land and many families continue with their traditional livelihood by going out to bush camps and fish camps and on spring and fall community hunts.

There is very limited research done on the impacts of climate change in Dene communities in Canada. While there is an abundance of literature on the health impacts of climate change in Inuit communities, Dene community research on the health impacts of climate change is virtually non-existent. This is very important research as there are over 10,585 Dene in Canada, many of whom live in the Northwest Territories and Yukon Territory. There is no published community-based and certainly no-youth led research around the health impacts of climate change in Dene communities in the NWT. Therefore, this project was both unique and timely.

Project Summary – How We Are Leading the Way

The key objective of this project was to expand on current community research capacity and to establish an inter-community learning network to share results and work towards solutions to climate change and health impacts on community. The Fort Good Hope Youth Video Research Crew (YVRC) was created and trained as part of the Sustainability's Paradox, a University of Oxford PhD research project partnered with the Fort Good Hope Elders Council and Arctic Health Research Network (AHRN) to continue video research in the area of climate change, health impacts and health adaptations starting in December of 2008- April 2009. The YVRC carried out interviews both in the community and out on the land with youth, Elders, leaders, hunters and trappers at the Our North, Our Future Youth Gathering in Tuktoyaktuk and with the Fort Good Hope On-the-Land-Gathering pilot project. Interviews were carried out and the youth then watched and edited the videos, looking for common themes and results and suggested adaptations and actions. The youth learned to engage critically with the issue of climate change, of ways these impacts affect health, and of what steps can be taken to adapt to these changes to enhance and support wellness and health in the community and region.

The project found that there are many changes happening on the land for many reasons.

- **Learning and education and sharing information** were noted as important adaptations, as were **harvesting and learning about traditional food and Dene Laws** as well as cooperation and working together.
- There is a **large enthusiasm from youth to learn more about the land and how to take care of it** and to be included more in community decisions about the future.
- Overall, climate change is happening, the changes affect health and many suggestions were made, the majority of which focus on **youth learning more about taking care of the land, being out on the land to become strong people and using the land for food.**

Capacity Building – Connecting the Guidance of the Past with the Needs of Today

Conference/Workshop Presentations

The Fort Good Hope Youth Video Research Crew (YVRC) presented their findings and shared their method of video research at the Our North, Our Future Youth Gathering in Tuktoyatuk Gathering with students from Aklavik, Tuktoyaktuk, and Inuvik the Fort Good Hope team showed the video “What changes have you seen in Fort Good Hope” to facilitate a discussion about what they had been doing, what people had reported and what they would do next. The group then shared what changes they had heard about in their communities. Through a video workshop, which taught how to use the camera and basic editing, the youth shared what climate change they had seen and how it had affected their communities and what could be done about it in the future.

Capacity was built in:

- Research capacity (designing and carrying out basic social science research, determining questions, planning and carrying out interviews)
- Media (camera, editing)
- Organizing and carrying out projects
- Youth goal setting and achievement
- Public engagement, media and sharing information
- Critical thinking and problem solving
- Analyzing data and carrying out follow-up interviews

More capacity needs to be built in:

- Project management

See what went on at *Our North, Our Future Youth Gathering* in Tuktoyatuk at www.ournorthourfuture.blogspot.com

Next Steps – How We Are Adapting to Climate Change

- The YVRC will present the end results and report to council and plan for next steps as a community. These next steps will be outlined in a new funding action proposal.
- YVRC will be sharing their results at the ACUNS student conference in September in Whitehorse as guided by the community.
- The YVRC in collaboration with the University of Oxford and Insight U.K. was invited to travel to Oxford to edit with Indigenous representatives from five countries and then travel to Copenhagen for the COP 15 Climate Negotiations to present their last three years of work from both Sustainability's Paradox and Climate Change and Health Adaptations. This trip included a reception and screening of the work at Canada House hosted by the Canadian High Commission.



Qaujigiartiit/Arctic Health Research Centre

COMMUNITY PROFILE

Location: Iqaluit, Nunavut
2011 Census Population: 6699
2011 Census Land Area (square km): 52.50

PROJECT INFORMATION:

Title: "Climate Change and Health Community PhotoVoice Research Project and Training Workshop"
Year Funded: 2009-2010
Area of Research: Education/Awareness/Promotion

CONTACT INFORMATION:

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Website: www.qhrc.ca



– Iqaluit, Nunavut

Title: "Climate Change and Health Community PhotoVoice Research Project and Training Workshop"

The History of Our People – Nunavut

It is well-known in Canada that northerners face a number of challenging circumstances to obtaining and maintaining good health. That said, there are tremendous strengths in communities to address local health concerns, such as a willingness to work together, traditions and customs that support healthy lifestyles and activity, and strong cultural pride. Drawing upon existing community strengths and resources and building community capacity is the key to addressing a number of health concerns in the North presently and over the coming years.

Project Summary – How We Are Leading the Way

The goal of this project was to undertake a three-day project in Iqaluit, Nunavut May 12-14, 2009 to provide training and experience to community members in Nunavut in PhotoVoice methodology. The purpose of this project was to build the confidence of community members in community-based research methods in order that they may lead their own health research projects and participate meaningfully in projects that come to their communities.

It is our hope that after this project, participants will feel comfortable to put forward their own project proposals to the Climate Change and Health initiative in the future.

Capacity Building – Connecting the Guidance of the Past with the Needs of Today

The objectives of the project were to:

1. Build **local capacity** to develop and deliver community-driven health research projects in Nunavut communities.
 - o We delivered a three-day workshop in health research methods; Inuit and community perspectives on ethical conduct in research; interviewing; and conducted a PhotoVoice research project with the workshop participants.
2. Provide **opportunities to learn hands on about data collection methods**, such as surveys, interviews and a PhotoVoice project in climate change and health.
 - o During the training workshop, participants were the researchers in a PhotoVoice research project exploring the impact of climate change on the health of northern communities.
3. Provide community members with important skills and resources to **be proactive about engaging in health research taking place in their communities** and expand the opportunities available to communities to address health concerns locally.
 - o In the evaluation of the workshop and research project, participants identified that these activities provided them with important skills, network connections, and both physical and online resources to be more involved with research in their communities.
 - o Two of the participants went on to conduct photovoice research projects with the Nunavut Department of Health and Social Services Public Health Strategy Team in the past year; one participant began a graduate program in a health-related field; and one participant has continued to work with Qaujigiartiit on community-based health research projects.
4. **Generate more community-driven health research projects** that are lead by community-members.
 - o To explore the land-health-environment relationship further by exploring community use of fresh water systems in Iqaluit and the impact climate change can/will/ does have on this important part of life in the North
 - o Explore the impact of climate change on food sharing systems and food support programs in Iqaluit through the eyes of the Iqaluit Food Bank and Soup Kitchen.





Outcomes

1. Community PhotoVoice Research Online Video Tool
2. Inuktitut language and terminology
3. Museum Exhibit
4. Journal Submission
5. Research Report

Overwhelmingly, the group felt that PhotoVoice was an empowering research method that allowed for ‘community expression’ and ‘social action’.

“Amazing how a few photographs can lead to such an organized, coherent set of themes and thoughts.”

“[PhotoVoice] has the potential to be a great teaching tool which could be used in school. It starts discussion and stimulates creativity. Makes me more aware of what I take a picture of - find a deeper meaning in the photographs I do take. Teaches you to see life a little bit differently.”

Visit Us Online!!

The materials, photos, reports, messages and instructional video have all been posted online on our website at www.qhrc.ca.



Pauktuutit Inuit Women of Canada, Nunavut

ORGANIZATION PROFILE

Location: Iqaluit, Nunavut

Website: www.pauktuutit.ca

PROJECT INFORMATION:

Title: "Inuit Women's Views and Priorities on Climate Change and Human Health Workshop - Pauktuutit Inuit Women of Canada"

Year Funded: 2008-2009

Area of Research: Education/Awareness/Promotion

CONTACT INFORMATION:

Pauktuutit Inuit Women of Canada

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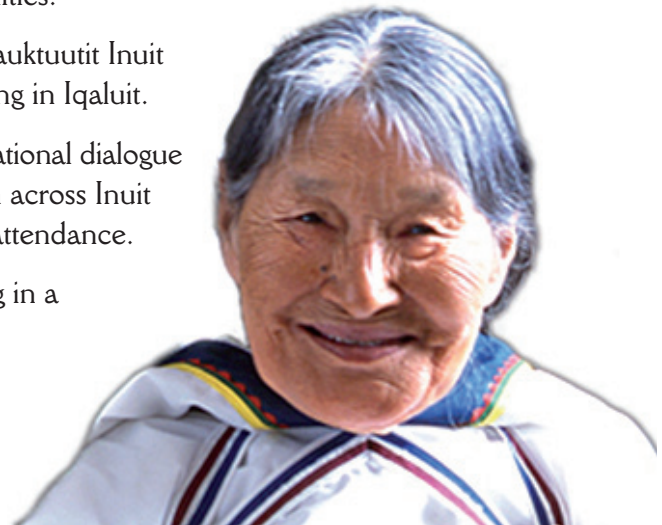
Title: "Inuit Women's Views and Priorities on Climate Change and Human Health Workshop - Pauktuutit Inuit Women of Canada"

Pauktuutit Inuit Women of Canada works to increase greater awareness of the needs of Inuit women and advocates for equality and social improvement. Pauktuutit leads and supports Inuit women in Canada in policy development and community projects in all areas of interest to them for the social, cultural, political and economic betterment of the women, their families and communities.

Celebrating their 25th Anniversary in March 2009, Pauktuutit Inuit Women of Canada held their Annual General Meeting in Iqaluit.

The AGM was a perfect time to facilitate and film a national dialogue on the impact of climate change as Inuit women from across Inuit Nunangat (the four Inuit landclaim regions) were in attendance.

The Pauktuutit AGM plenary was filmed participating in a workshop which introduced concepts/definitions of climate change and human health which then broke up into small groups which reported back to the main group.



Throughout the Annual General Meeting a small conference room (called “Speakers Corner”) was available for individuals to go and speak to the camera about their thoughts/experiences of climate change. Also, a visit and conversation on the changing climate with a local female Inuk hunter who was preparing a skin was filmed.

Filming was performed by the Iqaluit based film crew from Inuit Broadcasting Corporation.

The wide ranging discussions depicted (albeit briefly) in the final DVD covered food security, adapting traditional food preparation, traditional knowledge and activities such as harvesting and clothing production as well as recommendations for future research.



Pangnirtung, Nunavut

COMMUNITY PROFILE

Location: Nunavut
2011 Census Population: 1425
2011 Census Land Area (square km): 7.77
Website: <http://www.pangnirtung.ca/home>

PROJECT INFORMATION:

Title: "Understanding the impact of climate change on perceptions and practices related to water safety in Pangnirtung"
Year Funded: 2008-2009
Area of Research: Education/Awareness/Promotion

CONTACT INFORMATION:

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Title: "Understanding the impact of climate change on perceptions and practices related to water safety in Pangnirtung"

Project Summary – How We Are Leading the Way

Our research sought to identify Pangnirtung residents' views about whether or not climate change was having an impact on water, snow, and ice. In addition, we sought to understand whether or not/how these changes impact perceptions of water-related risk as well as water safety-related behaviour.

This research built on the findings of a three-year long project funded through the Social Sciences and Humanities Research Council (SSHRC) (Principal Investigator: Dr. Audrey Giles) that included three months of fieldwork in Pangnirtung in the summer of 2008 (fieldwork was also conducted in six other Northern communities). The SSHRC project focuses on the history of the NWT Aquatics Program (which includes what is now Nunavut) and the ways in which water safety might be improved for Northern residents, who drown at rates that are alarmingly high when compared to the rest of the Canadian population.

In Pangnirtung, we learned that community members are very interested in the impact that climate change is having on ice, snow, and water conditions, which is believed to enhance the vulnerability of people who are out on the land. This area of interest, however, is outside of the scope of Dr. Giles' SSHRC research project. Through this funding opportunity, the Hamlet of Pangnirtung, Dr. Giles, her colleague Dr. Shaelyn Strachan, and graduate students Gwentyth Stadig (who is the student who conducted the original research in the community), Michelle Doucette-Palmer, and local co-researchers Leah Kilabuk, Selina Kisa, Henry Mike, and Tommy Papatsie, conducted research that focuses on Pangnirtung residents' climate change concerns as they pertain to water, boat, and ice safety.

Our Approach

Methodology

- Interviews and focus groups were conducted with youths, adults and Elders to learn about climate change effects in their community.
 - Asked all participants to provide additional analysis of their contributions and also to help to develop the next steps for the research.
 - After receiving participants' feedback, we decided that the research findings would be best addressed in the form of materials (see results).
- Two one-week trips were taken to conduct interviews and report results back to the community.

Results

The following were recurring themes in the interviews and focus groups:

Ice and Snow Melt/Safety and Changing Weather Patterns

Both children and Elders spoke about ice safety and how it relates to currently unpredictable seasons and year-to-year differences in the freeze and thaw cycle. Elders repeatedly mentioned the visible change in the glacial cover in the fjords surrounding Pangnirtung.
- E.g. "During the 50s, 60s, 1965 during those years the glaciers on the mountain tops never used to melt, always used to be the same... There used to be glaciers all over the mountain tops... Back then the ice used to freeze very early and it wouldn't melt until the next year... We live in glacier area, and since it has been melting rapidly, the rivers are more rapid" (male Elder).

Changing Animal and Plant Patterns

Many people spoke about the differences in animal habitat, life cycles, migration and overall existence in the Arctic. For example, hunters have noted that seals are present all year long instead of coming in and out of the fjord seasonally; polar bear numbers are much higher than usual (some people speak of seeing multiple bears in one day, which is exponentially more than a single bear being seen over months in the past); animals are birthing and maturing in unusual sequences (male Elder).

Skepticism about Global Warming

Interesting perspectives were shared about the categorization of climate change as global warming:
- e.g. "when somebody says global warming we're skeptical about that, climate change, definitely yes; global warming, I don't know because we have this understanding about nature and the earth that it has its own reactions and its own way to deal with whatever it takes" (male adult).



Unstable Traditional Hunting/Transportation Routes

Hunters are increasingly finding their activities thwarted by changing stability of the land and ice paths to traditional hunting lands; - e.g. “we have all these traditional routes, whether it’s on the ice or whether it’s on the land, but because of the climate change, a lot of these traditional routes, we now have to vary from them because some of the ice conditions aren’t forming properly for one so we can’t go that route, we have to taking alternate routes” (male adult).

Capacity Building – Connecting the Guidance of the Past with the Needs of Today

Twenty-two people – youth, young adults, adults, Elders – participated in the research in the form of interviews and focus groups. We employed several community researchers. All community researchers received training in conducting interviews and community-based research. Importantly, they taught the university-based researchers a great deal and we know that we were truly fortunate to have these amazing Pangnirtung residents working with us. We feel that we did build capacity in a number of ways, particularly in terms of developing community members’ research skills (developing research questions, conducting interviews and focus groups, analyzing data, presenting data), but also the research teams’ ability to conduct responsive and responsible research for and with community members. Thus, bi-directional capacity was built.

Follow-up – How We Are Adapting to Climate Change

One academic paper will be submitted to a journal in early 2012. The results from the research were presented at a Health Canada workshop on climate change adaptation and to the Inuit Public Health Task Group.

We produced 100 thermoses (50 in English, 50 in Inuktitut) that used a community members’-generated list of items that people should take with them when they engage in aquatic-based activity in order to adapt to risks posed by climate change. We also had the same information published on 500 magnets. The magnets were distributed to school children, while the thermoses were distributed to Elders and hunters.

The research team would like to thank Health Canada for funding this research project and would also like to acknowledge Pangnirtung residents – particularly the community researchers, Hamlet staff, and participants, for making this research a success.



Jean Marie River First Nation, NWT

COMMUNITY PROFILE

Location: Northwest Territories
2011 Census Population: 64
2011 Census Land Area (square km): 37.29

PROJECT INFORMATION:

Title: "Impacts to the Health and Wellness of Jean Marie River First Nation in the Face of a Changing Climate"
Year Funded: 2010-2011
Area of Research: Education/Awareness/Promotion

CONTACT INFORMATION:

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Title: "Impacts to the Health and Wellness of Jean Marie River First Nation in the Face of a Changing Climate"

Community History – The History of Jean Marie River First Nation

The settlement of Jean Marie River is situated at the confluence of the Jean Marie and Mackenzie Rivers, at approximately 61° 31' North latitude and 120° 38' West longitude. It is 127 kilometers east of Fort Simpson and about 360 kilometers west of Hay River. It is located in the Great Slave Plain eco-region, which consists of low rolling marsh lands and willows; and dense spruce, pine, and poplar forests.

Traditionally, the *Tthets'éhk'é Délî got'ine* (the people who traditionally occupied the Jean Marie River area) lived and traveled over a very wide area within what is now called the Dehcho region of the Northwest Territories. For countless generations, people pursued a traditional lifestyle: hunting, fishing, trapping, and gathering plants and craft materials; moving with the seasons and resources throughout our traditional territory. The *Tthets'éhk'é Délî got'ine* had major family camps along the Mackenzie River from Mills Lake to Fort Simpson, in the Horn Plateau, at McGill Lake, at a traditional area called Selero, and at the 'three lakes': Ekali Lake, Sanguéz Lake, and Gargan Lake. No camps were permanent and people moved according to the seasons, often returning to the same general areas year after year.

In the early 1920s, the transition from a nomadic lifestyle to living in a more permanent settlement began on the recommendation of the Elder Norwegian. He recommended people settle at the mouth of the Jean Marie River (*Tthets'éhk'é Délî*), a traditional gathering and fishing spot. A permanent settlement slowly grew over the years, but people still pursued a traditional lifestyle for decades, traveling out from the settlement on a seasonal basis to camps spread out over our traditional territory. Some families remained at outlying lakes for years, only traveling into Jean Marie River and Fort Simpson for special occasions and supplies.

The JMRFN began as an independent band under the Indian Act in 1992. Prior to that, it was considered a sub-band of the Fort Simpson's *Líidlii Kue* First Nation, even though it has been functioning as an independent settlement for over 80 years.

By the 1950s, the settlement of Jean Marie River had begun to develop a non-traditional economy based around river transportation and logging. Collectively, the community members bought and operated a small tug boat for fishing trips, hauling firewood, installing channel buoys and hauling fuel (operating from the 1950s to 1980s); and a portable sawmill to produce lumber for local use and for export to other communities along the Mackenzie River. A sawmill is still in operation today. They also managed a community garden, producing cabbages, carrots, and even tomatoes for local consumption. This garden is no longer being planted.

These economic activities complemented the traditional economy and provided a balance between a subsistence and entrepreneurial/wage economy for many years. Today we are looking toward building greater economic sustainability through the development of greater self-sufficiency, a goal that climate change challenges, but also provides some new opportunities for sustainable economic and community development.

Project Summary – How we are Leading the Way

From the results of this project, the JMRFN is more aware of the far ranging impacts of a changing climate on different aspects of health. In comparison to other Aboriginal communities above the tree line in northern Canada, Jean Marie River First Nation has not been as severely impacted by climate change. However, from the changes our people are observing and experiencing many of these changes can be directly or indirectly linked with climate change. By conducting this project our community has taken the first step towards a proactive approach to identifying current and potential impacts associated with climate change, as well as thinking about how to respond to these impacts before they become too severe.

Furthermore, by exploring initial ideas for adaptation strategies our community can prioritize where the community is most vulnerable, how severe impacts are (or will be), and the ability for our community to adapt to reduce our vulnerability, and increase our resiliency, to climate change.



Capacity Building – Connecting the Guidance of the Past with the Needs of Today

Through community meetings, workshops, and presentations at the JMR School awareness of climate change as both a global and local issue was raised. The information disseminated came from a combination of scientific knowledge and from traditional knowledge shared by Elders and land users. Scientific knowledge helped frame the issue of climate change as something that is happening, and is especially noticeable in the North, and that this issue is having and will have serious impacts on peoples and ecosystems. The people of JMR have been noticing changes in the climate for decades and the traditional knowledge shared about how weather changes, and how these changes affect the land and people, provided valuable information about how things are changing locally that are associated with a changing climate. Traditional knowledge was also shared regarding how to respond to climate change, such as looking back at how past community members utilized their traditional and local knowledge to make JMR a sustainable community. Traditional knowledge is also essential for guiding and implementing adaptation strategies.

Next Steps – How We Are Adapting to Climate Change

The JMRFN has a baseline study to use as a platform to address and respond to climate change impacts that provides direction and concrete recommendations for our community. From this baseline study several possible next steps were identified by community members to address and take action to prevent and/or minimize the negative impacts of climate change. However, when we begin to develop and implement climate change adaptation strategies; we do not want to develop and implement these strategies as separate projects or initiatives, nor do we want short term solutions to a long term issue. The JMRFN needs to go beyond just developing and implementing adaptation strategies; our community needs to move towards adaptive management.

Adaptive management allows for adaptation strategies to be integrated into applicable aspects of our community planning, land use planning, health initiatives, culture camps, education, etc. In addition, by managing our adaptive capacity we can monitor and address the efficacy of the strategies we implement and modify them if necessary. Adaptive management elevates the organization of adaptation strategies in an integrated fashion that would allow our community to ‘mainstream’ climate change issues and adaptation strategies with other aspects of our community plan that promote cultural continuity and community sustainability.

The JMRFN is moving forward with developing and implementing adaptation strategies identified from this project as knowing more about how the climate is changing and is impacting the environment and our community, will allow us to better prepare and respond to these impacts.



North West River, Nunatsiavut

COMMUNITY PROFILE

Location: Nunatsiavut
2011 Census Population: 553
2011 Census Land Area (square km): 3.20
Website: <http://www.townofnwr.ca/home/>

PROJECT INFORMATION:

Title: "Traditional Knowledge: A Blueprint for Change"
Year Funded: 2010-2011
Area of Research: Education/Awareness/Promotion

CONTACT INFORMATION:

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Titles: "Traditional Knowledge: A Blueprint for Change"

Community Profile: The History of North West River

North West River (formerly known as Fort Smith) is a small sub-arctic community of 492 people (approximately 82% identify as Aboriginal, primarily Inuit) located in central Labrador and situated on the northern shore of Lake Melville, 35 km north-east of Goose Bay. The town has over 260 years of documented history and has been occupied by Labrador's Innu and Inuit for at least 4,000 years. In the mid-1700s, Europeans made their way to the area to avail themselves of the abundant wildlife in the area. North West River was the location for a year-round trading post that was established by French fur trader Louis Fornel in 1743 and was also a location for a Hudson's Bay Trading Post in later years.

The community of NWR has a university-run research centre, a municipal library and K-12 school, and has year-round road access to the community of Goose Bay, which has a modern all-year airport. Much of the marine shipping, (freight, fuel, etc.), to and from Labrador, passes through Lake Melville. A potential uranium mine, located approximately 100 km to the north, has recently been identified for possible development, and current company plans call for a road to be developed through NWR to accommodate the shipment of yellow cake to market (Aurora Energy 2008).

Project Summary: How Sivunivut is leading the Way

In 2009, Sivunivut Inuit Community Corporation Inc, which represents the Labrador Inuit Land Claims Agreement (LILCA) beneficiaries in North West River, approached the Labrador Institute (LI) to see if they were interested in collaborating on a community-based research project in North West River; which would collect and preserve knowledge of Inuit residents that could be used to develop climate change adaptation plans in the future.

From this request, the *Traditional Knowledge: A Blueprint for Change* Project was conceived and directed by Sivunivut Inuit Community Corporation (Sivunivut), working in partnership with the Labrador Institute (LI) and was jointly funded by Health Canada's First Nations and Inuit Health Branch and the MITACS Accelerate program. The overall goal of the Project was to train Inuit residents of North West River, Labrador to collect and map the ecological knowledge of other Inuit in the community and record their observations of on-going landscape transformations in the Lake Melville-Grand Lake region.

Overall the project successfully attained its two main objectives:

1. **Training community members** in research methods, surveying, data management, and project planning; and
2. **Creating a GIS database** that can be used by Sivunivut immediately to produce media (e.g. posters, maps, website, etc.) for community members regarding characteristics such as safe and unsafe ice conditions, travel routes, and sensitive habitats.

Capacity Building – Connecting the Guidance of the Past with the Needs of Today

Knowledge exchange between scientists and community researchers helped extend both ways of knowing by sharing tools and understandings to build on each others knowledge systems.

Training community members in:

- Project management and planning
- Learning survey methodology
- Use of computer software (Word, Excel, Google Earth)
- Data management and task-tracking
- Presentation skills (via Program Results Workshop in Ottawa 2011)

Researchers were privy to:

- Teachings on local hunting, trapping, and travelling on the land techniques
- Learning about the locations of important resources and routes for the community
- Traditional ecological knowledge of the region, and the significance of the land and the resources to the Inuit of North West River
- Hearing about the changes that the Elders had witnessed over their lifetime, as well as their views on why these changes have occurred.

Next Steps – How We Are Adapting to Climate Change

More detailed look into what future plans are underway in the continuation of the GIS database developed during *Traditional Knowledge: A Blueprint for Change Project*.

STAGES

1- This stage will be the collection and incorporation of local place names into the GIS database.

2- Stage II of Sivunivut's research plan is detailed data collection. It will involve two primary tasks: detailed interviews, and fieldwork. The goal will be to record additional environmental observations about the locations/areas that are most significant to the community as well as stories about events that have occurred there. The second task will be to visit these sites and record detailed environmental characteristics using techniques such as photography, videography, art, stories, music, field notes, etc.

3- Stage III will see these locations monitored over a number of years. By recording the environmental characteristic on a regulated schedule (e.g. bi-annually for ten years) Sivunivut will create a long-term record of the physical transformations at each location and the impact of these transformations on the community.

Next Steps – How We Are Adapting to Climate Change

The initial scope for the project was quickly deemed unfeasible in the given timeframe of one year. From this realisation, the project was broken down into a multi-year research plan with clear achievable objectives, which will allow Sivunivut, and the community of North West River, to document, in detail, the existing ecological knowledge of the community, monitor and record ecological transformations as they manifest, and eventually develop an adaptation plan for the community.

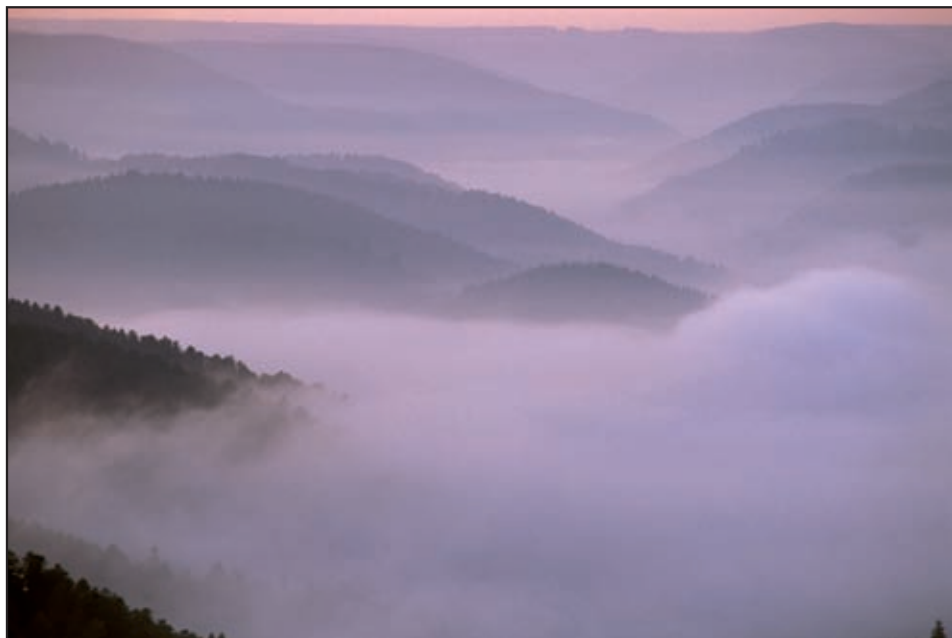
Through the completion of the *Traditional Knowledge: A Blueprint for Change* Project, Sivunivut concluded that several additional data collection steps were required to continuously improve the GIS database developed in phase I. A three stage multi-year plan was developed and is currently being implemented. Stage I focuses on collection and incorporation of local place names into the GIS database; Stage II on detailed data collection on specified locations from Stage I; and Stage III will involve the continuous monitoring of the identified locations.

This knowledge will be extremely valuable to the community of North West River as they move forward and adapt to transformations in the local climate and ecology. Many of the research outcomes will also benefit other communities who are coming to terms with transformations in the environment, but lack details on the impacts of specific transformations.

Project Team

This Project was a collaboration between Sivunivut and the LI. The following personnel made up the Project team:

- Ed Tuttauk, Chairperson, Sivunivut – Project Manager
- Keith Chaulk, Director, Labrador Institute – Project Executive
- Scott Neilsen, Program Coordinator, Labrador Institute – Project Co-ordinator
- Herman Anderson, Researcher, Sivunivut – Community Researcher
- Billy Edmunds, Researcher, Sivunivut – Community Researcher
- Jennifer Butler, Program Coordinator, Labrador Institute – Project Reviewer
- Bryn Wood, Nunatsiavut Government – GIS specialist
- Beatrice Dickers, Labrador Institute – Administrative Staff Specialist



Clyde River, Nunavut

COMMUNITY PROFILE

Location: Nunavut
2011 Census Population: 934
2011 Census Land Area (square km): 106.55

PROJECT INFORMATION:

Title: "Arnait Project: A Women's Retreat on Climate Change and Health"
Year Funded: 2010-2011
Area of Research: Education/Awareness/Promotion

CONTACT INFORMATION:

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Title: "Arnait Project: A Women's Retreat on Climate Change and Health"

Project Summary – How We Are Leading the Way

This project builds upon an existing project funded by the Social Sciences and Humanities Research Council of Canada (SSHRC) which was carried out in the Inuit communities of Clyde River and Qikiqtarjuaq, Nunavut, titled the "Arnait Project: Inuit Women and Subsistence: Social and Environmental Change". The purpose of the research was to conduct an on-the-land retreat, bringing together women from Clyde River and Qikiqtarjuaq to share their research, experiences, and knowledge. The entire retreat was based on traditional knowledge; Elders taking charge of project planning and the design of retreat activities. The retreat allowed women from both communities to share and discuss their own observations of social and environmental change, as well as strategies for adapting and capacity building.

Objectives:

- On-the-land-retreat for women from Clyde River and Qikiqtarjuaq to share knowledge and support each other in responding to the impacts of climate change
- Discuss concerns and challenges with regards to health issues, specifically those related to climate change (food security, health of food resources, access to healthy foods, safety on the land)
- Discuss emotional health (stress that comes with changing environment) and strategies to keep families safe
- In the long term the retreat will aim to help create a support network between the two communities in discussing and responding to climate change and health impacts

Summary of Findings

One of the very interesting findings of the retreat was learning the women's approach to linking climate change and health. Their retreat workshop topics reflect this with discussions such as 'How to be a good person' and 'what we should be teaching young girls'. In order to be resilient to both environmental and social changes, we need to be strong women. We need to be strong and healthy people, and strong and healthy families. To adapt to any changes we face in our community, society, culture, and environment, the core of who we are needs to be healthy. And so the land retreat was critical, to give women that dedicated time to reflect, have personal meditation time, connect with each other, and connect across communities. One might not think that "Being a good person" would fit within a climate change centred project, but it is precisely by being a good, healthy person, in a healthy community, that we will be able to deal with any change that comes our way. It was this core belief that created the foundation for the women's design of the retreat.

This understanding of climate change and health provides an overall context for the more specific information we were able to collect during the one-week research activities on the retreat and back at the community. One set of data we were able to collect relates to the resources that women need in their lives and how they share resources among each other and within the community. This information is critical to our larger SSHRC project that is trying to understand sharing networks among women. We collected very detailed information about women's family members, what resources they share, what resources they require, and how they spend their time. The data show that it takes women piecing together a wide variety of resources to support their families.

In our surveys of women about their observations of climate changes, an interesting finding (though not unexpected) was that women ages 16-20 and 21-30 did not have many observations about changes in the environment, in animal condition (working with meat or skins), and remarked that they do not go out often or that men would be better to ask. Women ages 41 and over, however, did have several observations about the changing conditions of animals and of the environment. These women are more likely to go on the land, and also some spent their childhood on the land so have a greater understanding and context about environmental changes.

photo courtesy of Shari Gearheard



Capacity Building – Connecting the Guidance of the Past with the Needs of Today

We found the land retreat to be an excellent means for sharing knowledge and gathering information. Having the women choose discussion topics and lead discussion groups (full groups or pairs) allowed them to identify and explore information that the researchers would otherwise not know about. The collaboration and day-to-day chores needed in order to run the camp were important in creating trust and bonds between women, and the camp setting was a powerful means to set up the support networks that we were aiming for (as opposed to simply having an indoor workshop in a conference room). The women got to know each other through camp work, sharing tents, and preparing food. The network was a success as we know that several of the women have kept in regular touch since the retreat and have contacted each other to participate in subsequent workshops and training opportunities.

Next Steps – How We Are Adapting to Climate Change

Responding to any kind of change takes time, and adapting to environmental change is no different. The retreat set the groundwork for women to share ideas about strengthening their communities through more research, projects, and initiatives with youth. For example the women suggested that another retreat be held, and this time involves girls, so they can learn the knowledge of Elders and become part of the support system being developed.

Again, the philosophy of the women is not to develop a static plan, but rather to strengthen individuals, over time and through many means, in order to be adaptive people and able to handle any changes that come their way.



Aklavik, Inuvialuit

COMMUNITY PROFILE

Location: Inuvialuit
2011 Census Population: 594
2011 Census Land Area (square km): 8.16

PROJECT INFORMATION:

Title: "Aklavik Elder's Traditional Knowledge, Climate Change and Community Health"
Year Funded: 2010-2011
Area of Research: Education/Awareness/Promotion

CONTACT INFORMATION:

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Title: "Aklavik Elder's Traditional Knowledge, Climate Change and Community Health"

The History of Our People

Aklavik means "Where the bear was killed" in the Inuvialuktun language. Aklavik is located in the Mackenzie Delta area which is rich in wildlife, waterfowl, fish, trees, berries and other valuable natural resources. Aklavik is located close to the Richardson Mountain range to the west; and 113 kilometers north of Aklavik is the Beaufort Sea. Aklavik's rich natural resources have made it a natural harvesting area for the Gwich'in and Inuvialuit who traditionally used and occupied this area for as long as their people can remember.

The Inuvialuit and Gwich'in have relied on a subsistence based traditional economy for most of their history. The community of Aklavik was created in 1910 after the collapse of the whaling industry and depopulation of the original peoples due to introduced diseases. The Fur Trade became the primary economic activity that supported the growth of Aklavik during the early 1900s. Starting in the mid-20th century, the Canadian federal government began to invest in northern communities and encouraged people to move off the land into modern communities to access the health, education and other government services. In the early 1950s the federal government decided to relocate Aklavik mainly because its location in the delta had limitations on community growth and the area was prone to flooding. This resulted in the creation of Inuvik as a modern new northern community. The population of Aklavik was reduced substantially due to the creation of Inuvik but many Aklavik people remained mainly because the location was rich in wildlife, fish and other natural resources that sustained a traditional economy.

The move from a traditional based economy with reliance on the land and its resources to a modern wage employment economy brought many changes. Housing, food, education, health and welfare, governance, justice and all aspects of the traditional societies were impacted as these groups moved from their traditional ways to modern systems. Aboriginal political development increased after oil was discovered in the Beaufort-Delta Region in the late 1960s. After a long period of negotiations both the Inuvialuit and the Gwich'in settled land and resource land claim agreements with the federal government.

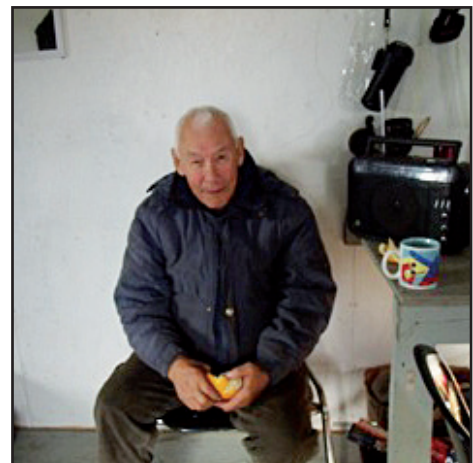
Project Summary – How We Are Leading the Way

We wished to gather traditional local knowledge from Inuvialuit and Gwich'in Elders on their observations and experiences possibly related to climate changes. We wanted to find out what the Elders and hunters are seeing first hand as a result of climate change so that the information gathered could help our community members to plan and manage their traditional harvesting and healthy traditional food consumption activities.

The question the project attempted to answer was:

What are our Elder's and Hunter's experiencing during their traditional harvesting activities that may be related to Climate Change?

The project involved the collection of traditional knowledge from Elders and hunters through face-to-face questionnaire surveys, interviews, group sessions, meetings and cultural activity observations. The traditional knowledge and cultural activities observed were recorded, analyzed and used to develop a database of traditional knowledge that community members can now use to help make informed decisions related to health, safety and wellness.



Some Key Findings

- Spring comes earlier/melts faster (n=92)
- Freeze up is later/longer to freeze (n=70)
- Changes have been observed for the last 10 to 15 years (n=52)
- Too much beaver now/making too many dams (n=138)
- Lots of moose in the Delta & Coast (n=126)
- Not much caribou this year (n=93)
- Weather is harder to predict (n=52)
- Caribous are having a hard time to get food nowadays (n=78)
- Birds are believed to be benefitting the most from climate change (n=31)

Capacity Building – Connecting the Guidance of the Past with the Needs of Today

- Members of our research team gained skills and knowledge in scientific research data collection.
- The participants and community members benefited from learning about and understanding how research is conducted and how it can contribute to broader management initiatives.
- The project allowed our Elders and hunters to provide valuable traditional local knowledge to local and academic researchers.
- The study helped increase awareness of healthy lifestyle behaviors, practices, and choices related to climate change.

Next Steps – How We Are Adapting to Climate Change

- Local Community members need to adjust their travelling patterns. Ex: traditional way of going that route, the river is getting narrower or drying up.
- Local Community members tend to buy more store bought foods...traditional foods are harder to get.
- Learning to work with what we got...hard to predict what will happen.



Traditional Medicine

“Traditional medicine knowledge holders have a profound understanding that there exists a binding relationship between environment and plants as medicine (Assinewe 2002)”

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.”

Societies throughout the globe have developed cultural practices and expertise focused on maintaining or restoring the spiritual and physical well-being of its peoples through the use of medicines. There are different approaches to healing which have been defined as western, alternative, and or traditional medicine. All disciplines have contributed a wealth of knowledge towards our understanding and improvement of health and well-being; however, we will be focusing on traditional medicine 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 medicines - the Relationships between Plants, People, and Medicine

Scientists have discovered that plants develop ways to interact with their environment by producing chemicals that serve as survival functions. These include but are not limited to repelling predators and other plants, enhancing reproduction, and communication with other living organisms. Luckily these chemicals, identified as secondary metabolites, have medicinal properties and if properly collected and prepared can offer effective treatments for a variety of illnesses. The extraction and use of isolated medicinal compounds has contributed to many successful medical treatments. What is lacking, however, is a holistic understanding of traditional medicine's spiritual and physical healing properties.

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 put 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 a knowledge that is passed on from generation to generation through storytelling, traditional practices, songs and ceremony.

The well-being of community is often equated to the holistic well-being of its people.





Impacts of Climate Change

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 (Gilbert N. 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.

Traditional Medicine Projects – The Stories Behind Them

Northern First Nations and Inuit communities have taken action towards the preservation and continuation of traditional medicine. Through Health Canada's Climate Change and Health Adaptation Program, four 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.



Reindeer moss and caribou moss or also known as reindeer lichen; "*Cladina rangiferina* and *Lichen rangiferinus*".

Nain, Nunatsiavut

COMMUNITY PROFILE

Location: Nunatsiavut
2011 Census Population: 1188
2011 Census Land Area (square km): 94.58

PROJECT INFORMATION:

Title: “The development of an Inuit focused ecohealth program in Nain, Nunatsiavut: a pilot study for building capacity while adapting for a healthy future”
Year Funded: 2010-2011

CONTACT INFORMATION:

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Title: “The development of an Inuit focused ecohealth program in Nain, Nunatsiavut: a pilot study for building capacity while adapting for a healthy future”

Project Overview

The “Our Plants Our Land” research project has successfully recorded the traditional knowledge and language surrounding plants, and a wealth of information concerning climate change impacts and indicators of its influence on berries, vegetation, animals, local environment and Inuit traditional activities in Nain, Nunatsiavut. This community-based research project has successfully combined semi-structured interviews, field research and monitoring, and an Elder guided youth workshop to accomplish its goals. Throughout the process, community members have been intimately involved in all aspects of the project as researchers, translators, interview participants and teachers. The team has synthesized and disseminated research results and emphasized the importance of making them readily accessible to all Nain residents. Facilitating the production of common language outputs, both written and interactive, have helped to successfully translate research into improved community well-being.

Traditional Knowledge

At the outset, the team turned to Elders in the community for their valuable input. General interview topics included changes in plant communities (i.e. distribution, growth, taste), berries, weather and the seasons as well as the traditional uses and naming of plants. Community members also mapped the locations of observed changes onto topographic maps of the region. Later, the team broadened their understanding of plants looking towards the meaning of Inuit plant and habitat names and the traditional description of those habitats within the landscape.

This traditional ecological knowledge is linked with previous information furthering the implications for future land use, conservation and sustainable development. The voices of participants have been

captured as quotes in a booklet entitled “*The Our Plants Our Land, Community of Nain, Labrador Plant Uses Booklet*”. This is a not for profit publication that is currently in press for community distribution. The booklet also summarizes an Elder-youth workshop that took place in September 2010. To further pay tribute to the participants, posters with pictures and quotations from interviews have been compiled. The posters have been displayed around town, so that they can be shared with everyone in Nain.



The Elder-youth Plant workshop served to combine traditional knowledge and science in the form of a “green class” taught by Elders and facilitated by the research team. The two day workshop began on September 15, 2010 and was an all day excursion to Paul’s Island during which participants benefitted from fresh air and incredible sunshine. After a boat ride to the island from Nain in the morning, students teamed up with researchers to find plants. Later students brought the plants back to the beach where Elders were waiting to share their knowledge of use and stories about them and the past. Students took notes that they would use the following day. Afterwards everyone continued to bond over a traditional “boil up” lunch and games played during the boat ride home. The following morning, plants were grouped and the sharing continued at the Nunatsiavut Government building. Once Elders felt they had fully shared their knowledge of plants, participants discussed the impact of the workshop.

The consensus was that it was an enjoyable experience that allowed Elders and youth to reconnect with each other and the land. Elders left to enjoy the rest of their day and students returned in the afternoon. Researchers worked with students showing them how to press and dry plants for the initiation of Nain’s first herbarium (plant library) collection. The activities and plant pressing method taught during the workshop are also captured in the plant uses booklet so that participants have a lasting keepsake of the day’s activities.

Field Research and Monitoring

Simultaneous with interviews, fieldwork has been taking place in Nain. The research team is using small greenhouses called “open top warming chambers” to understand how changing climate will affect tundra plants, including berry shrubs and some of the plants eaten by caribou, such as lichens. They are also measuring markers of climate change such as increased temperature and changes in precipitation. Snow measurements taken in winter 2011 complement

these data. The goal is to try to describe how plant communities are responding to current climate conditions and to predict how they might change with future climate change and impact Inuit health. These field data are complemented by the interviews previously mentioned on climate change and will be available in the form of a booklet available in English and Inuktitut.

Successes

The research team has worked to synthesize and disseminate results and make the outcomes of research more accessible to all community members. Community outputs are at the heart of the team's success. Interactive outputs included an "*Elder guided plant uses workshop*" and a well attended "Community information session" in winter 2011 summarizing progress. These outputs allowed participants to learn, get updated, offer input and get answers to their questions. Participant recommendations from these meetings have been incorporated in our work. Educational and written outputs include herbarium specimens made by local students, a plant identification book, workshop summary and plant use booklet, climate change observations booklet, and community posters that showcase local Elders and their knowledge of plants, plant uses and environmental changes in their homeland.

Community involvement in research design, implementation and data interpretation enrich results and give them meaning and value at the community level. Youth from Nain have participated in fieldwork, learning while helping researchers with their tasks. All of these activities support the translation of knowledge into increased community wellbeing by strengthening cultural identity and environmental adaptability for the future.

Acknowledgments

This community based research program also benefited from related funding from Health Canada, International Polar Year-CiCAT, ArcticNet and NSTP.

Photo Credits: Alain Cuerrier, Ashleigh Downing, Jason Dicker



Ross River First Nation, Yukon

COMMUNITY PROFILE

Location: Yukon
2011 Census Population: 352
2011 Census Land Area (square km): 20.62
Website: <http://www.yukoncommunities.yk.ca/communities/rossriver/>

PROJECT INFORMATION:

Title: "Culturally Important Plants of the Ross River Dena, and Associated Impacts Related to Climate"
Year Funded: 2010-2011
Area of Research: Traditional Medicine
Project Partners: Northern Contaminants Program
Dena Kayeh Institute
Canadian Boreal Initiative

CONTACT INFORMATION:

Application name: Norman Sterriah, Council Member
Ross River Dena Council
General Delivery
Ross River, YT, Y0B-1S0
Email: sterriah@northwestel.net



Title: "Culturally Important Plants of the Ross River Dena, and Associated Impacts Related to Climate"

Project Purpose

The purpose of this project was to document culturally important plants. The study was undertaken for three reasons: (1) to ensure that our knowledge about these plants is retained, (2) reveal where sensitive plants occur so as to protect them, and (3) to share this knowledge with the Ross River Dena so that they might return to their traditional use of some of these plants. Indigenous plants are clearly a healthy substitute for some of the commercially produced medicines and foods available to us. Studies have consistently found that where diet has shifted away from commercial foods to local traditional foods there have been significant health benefits. This is particularly important given the high incidence of diabetes, cancer, and other diet related diseases in our community.

Methods of Study

This work is the product of 23 one-on-one interviews and three community workshops with the Elders of the Ross River Dena. The information obtained covers most of the plants in our traditional use area that were and are used by our people. These uses include medicine, food, tools, or spiritual icons.

Products

Two products were completed:

1. A comprehensive database was produced, including an inventory of important plants and maps indicating where some of the more sensitive and important plants occur. This map has become part of a comprehensive Traditional Knowledge database, and has provided input into land and resource planning.
2. A book was completed, *Gu None': Ethnobotany of the Ross River Dena*. Approximately 80 culturally important species of plants (as well as mushrooms) are presented in this book, organized by broad groups, including trees, berries, flowering plants, lichens and mosses, and mushrooms. Medicinal parts of some mammal species are also presented. For each plant, a description of its habitat is given, followed by its cultural importance and the steps in its preparation. Any *á'ii' / du la'* (traditional laws) that apply to the plant are included, as well as excerpts from stories in which plants play a key role. Also, Kaska names are given and for some species translations of these names are provided. Photographs are presented for most of the plants. And finally, a medicine chart is included at the end of the book that organizes medicines by which parts of the body they can be used for.



Red bearberry; "*Arctostaphylos uva-ursi*".



Alpine bearberry; "*Arctostaphylos alpina*".

Selkirk First Nation, Yukon

COMMUNITY PROFILE

Location: Central Yukon
Population: 280
Land Area (square km): N/A
Website: <http://www.selkirkfn.com/>

CONTACT INFORMATION:

N/A

PROJECT INFORMATION:

Title: "Climate Change and Health – Linking our Past and Future through our Traditions and Culture: An Ethno-Botanical Resource Study to determine the Effects of Climate Change on Traditional Ecosystems"
Year Funded: 2009-2010
Area of Research: Traditional Medicine



Title: "Climate Change and Health – Linking our Past and Future Through our Traditions and Culture: an ethno-botanical resource study to determine the effects of climate change on traditional ecosystems"

Abstract from Pan-Arctic Results Workshop – Ottawa, Feb 7-10, 2011

The purpose of this project was to determine the effects of climate change on traditional ecosystems that provide plants used for medicinal purposes. This study assisted the Selkirk people in understanding how changes in their environment will impact their ability to maintain traditional medicinal practices. Traditional medical practices are being relied on more so now than ever.



The benefit of this project to the community was the knowledge transfer from Elders to youth, and on gaining a better understanding of the impact of climate change on future health treatment needs.

Acho Dene Koe First Nations, NWT

COMMUNITY PROFILE

Location: NWT
2008 Population: 623
Land Area (square km): N/A

PROJECT INFORMATION:

Title: "Research of Traditional Medicinal Floral Resources within
Acho Dene Koe First Nation's Traditional Territory And the Impact of Climate Change"
Year Funded: 2009-2010
Area of Research: Traditional Medicine

CONTACT INFORMATION:

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*Title: "Research of Traditional Medicinal Floral Resources
within Acho Dene Koe First Nation's Traditional Territory
and the Impact of Climate Change"*

*Abstract from Pan-Arctic Results Workshop
– Ottawa, Feb 7-10, 2011*

This project examined traditional medicine and how they are being affected by climate change. The research project interviewed Elders, mapped the medicinal territory and incorporated the information in the existing mapping system. The project's focus was on the importance of protecting the medicines.

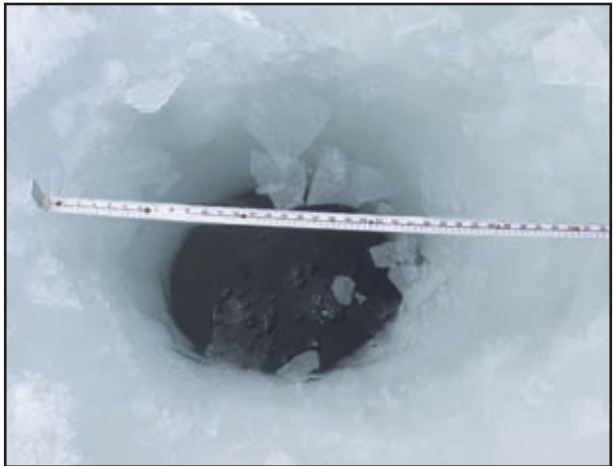


Ice Monitoring

“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 *et al.* 1996; Nuttall *et al.* 2005; Kuhnlein and Receveur 2007; Ford *et al.* 2009; Mead *et al.* 2010).





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.

Since 2008, several Inuit communities have identified that increasing access to TEK and other knowledge systems on ice conditions could help improve travel safety and increase food security.

Salluit, Nunavik

COMMUNITY PROFILE

Location: Nunavik
2011 Census Population: 1347
2011 Census Land Area (square km): 14.39
Website: <http://www.nunavik-tourism.com/Salluit.aspx>

PROJECT INFORMATION:

Title: "Real-time Monitoring for Travel Safety and Food Security in Salluit, Nunavik"
Year Funded: 2010-2011
Area of Research: Ice Monitoring

CONTACT INFORMATION:

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Web: <http://salluitmonitoring.ca/> (Ice Monitoring Web Portal)



Title: "Real-time Monitoring for Travel Safety and Food Security in Salluit, Nunavik"

Community History – The History of Our People

Salluit stands at the far end of the narrow Sugluk Inlet, 10 km inland from the Hudson Strait, hidden between high, rugged mountains rising close to 500 m. Salluit, being the middle point between Nunavik's 14 communities, is a strategic location for meetings attended by people of the Hudson and Ungava coasts. Salluit means "The Thin Ones" in Inuktitut, referring to a time when local inhabitants were facing starvation as a result of lack of wildlife. Though the village's name suggests that it has not always been the case, the area is rich in wildlife and arctic plants. The coastal seabed teams with mussels and clams. Sallumiut enjoy a variety of dishes which include arctic charr, caribou, bannock, berries, roots and herbs. The very harsh climate endured by Sallumiut is indelibly engraved in their way of life, endowing them with an incredible sense of survival. An explanation for the name of this village recounts that, long ago, some Inuit were told the region abounded in wildlife. Yet when they arrived they found almost nothing to eat and, as a result, suffered near starvation.

In the 2006 Census, Salluit had 1241 inhabitants with much of the population of Inuit descent. Main activities within the community still consist of fishing and hunting. Recently, rapidly melting permafrost is threatening to undermine existing infrastructure. Salluit has experienced a 2.6°C temperature increase between 1990 and 2003 and has witnessed the problems that such an increase can inflict - damaged buildings, roads and embankments, and the relocation of 20 new homes from unstable land.

Project Summary – How We Are Leading the Way

Climate change in the form of warmer and shorter winters is affecting Inuit subsistence activities, resulting in shorter ice season, reduced access to traditional resources and increased risks for travel during the winter season associated with less stable and/or thinner ice. This project, conducted by the Nunavik Research Centre (NRC) of Makivik Corporation and the Qaqqalik Landholding Corporation from the Northern Village of Salluit, assesses these impacts and implements a monitoring program for purposes of travel safety and food security. The monitoring program was designed as a multi-seasonal, multi-year program and allows community members to evaluate travel safety conditions as they relate to local weather patterns, through a web portal in real time.

The project was grounded in Inuit knowledge and indentified the following:

1. Most frequently used hunting and fishing grounds in winter;
2. Most frequently used travel routes to key subsistence areas and how they have been changing in recent times;
3. The current method used by community members of determining which travel routes are safe to take; and
4. The usefulness of visual aids and real time weather data in choosing safer travel routes and most appropriate mechanism for delivering real-time data.

The project was conducted in a multi-phase approach and included:

1. Research and planning;
2. Community consultations and collection of Inuit knowledge;
3. Geospatial data processing and community fieldwork; and
4. Web portal development, monitoring, communication of results and training.



The four project phases created the following key deliverables:

1. Traditional ecological knowledge (TEK) database – information collected during community consultations was used to update the TEK database initially collected in 1970s;
2. Weather stations - three key travel routes were identified to key subsistence areas as well as desired locations for six weather stations. At the end, only two weather stations were installed due to bad weather conditions (caused by delays in the project start-up and in delivery of weather stations and related equipment);
3. Web portal - developed to disseminate climate change information and to provide real time access to information from the weather stations located along the key travel routes. The monitoring tool assists subsistence hunters to make safer decisions reducing delays in accessing traditional foods and through improved travel safety reduce the number of travel-related accidents; and
4. Training was provided to Members of Qaqqalik on use of the web portal.

Capacity Building – Connecting the Guidance of the Past with the Needs of Today

The project engaged the community through community workshop and training and capacity building sessions.

Community members:

1. Collected TEK interviews including designing an interview template, how to record geospatial information and presenting results for verification;
2. Played an integral part of conducting the TEK interviews;
3. Were integrally part of the fieldwork to assemble the monitoring equipment; and
4. Received web portal training and future training will be instructed by the community project team lead at the Qaqqalik Landholding Corporation.

Next Steps – How We Are Adapting to Climate Change

Many of the deliverables for this project are products and services that we will continue to use. The monitoring stations will continue to be used for many years along the trails in Salluit. The stations will continue to upload real-time weather conditions at the trail sites and thus, community members will continue to use the website (<http://nunavik.lakeice.ca>) to view the data and determine if travel conditions are safe.



Nain and Hopedale, Nunatsiavut

PROJECT INFORMATION:

Title: “Establishment of Inuit community Based Ice Monitoring and Surveillance Programs for Human Safety and Security”
Year Funded: 2008-2009
Area of Research: Ice Monitoring

PARTNERS:

Chris Furgal, Professor, Indigenous Environmental Studies Program, Trent university, Peterborough, ON K9J 7B8; Email: chrisfurgal@trentu.ca

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Title: “Establishment of Inuit community Based Ice Monitoring and Surveillance Programs for Human Safety and Security”

Project Overview

Inuit communities throughout the Canadian Arctic, including Nunatsiavut, are reporting changing climatic conditions that are influencing sea ice safety and stability for human travel and land/resource access. Sea ice serves as an important trail and access point to key travel and hunting areas around communities; this safe connection to land and sea is critical for Inuit health and well-being.

Many communities have identified the need to document changes in local ice conditions that threaten safe travel and hunting. Therefore, community based monitoring stations have been established to enhance community capacity to observe, track and learn about and eventually adapt to changes in local sea ice conditions associated with climate and other forms of environmental change and variability. Sea ice observation stations were established throughout Nunatsiavut.

A simple and robust method already used in the North, along with reliable equipment was used to ensure that communities collected high quality data. These data help inform residents of the safety and conditions of sea ice in the local environment, which ultimately is aimed at reducing the risk of injuries, trauma and anxiety related to the changing ice environment. The weekly sea ice conditions are made available to the community through bulletins, radio broadcasts, social networking and word of mouth. The monitoring and communication of ice conditions in the local environment around communities supports community learning and adaptation and ultimately helps to reduce or mitigate exposure to ice related hazards for human safety in Inuit communities.

Traditional / Local Knowledge

Station locations were chosen by local monitors according to the proximity to important trails, their representation of local variability and their use as sentinel locations for ice conditions in surrounding areas. The ultimate objective of the project is to lead to the development of community-led and operated monitoring, surveillance and communication networks in these communities that use both local Inuit and scientific knowledge and observation techniques and that provide real time, weekly ice condition updates.

Field Research and Monitoring

Two ice monitoring stations were installed and maintained at two critical points that are important for travel and hunting for residents of the community of Nain. The stations were installed using the method previously employed in this location for projects funded under Health Canada and used in other Arctic communities (e.g. Nunavik and Nunavut communities). The method uses four simple ice measuring devices and nine snow stakes per station. This allows for an average ice and snow depth at each station. These stations were monitored weekly and the results were disseminated to the community. Community members found these stations very valuable, due to the fact the sea ice was thinner and less predictable than in most years. Residents felt safe using the same routes that the ice monitors used to travel to the stations, knowing that local surveyors are monitoring the area.

Successes

Two ice monitors were trained through the management of Sikumiut Environmental Inc. and Trent University. They learned the process of installing and maintaining the stations while spending time on the land with fellow community members. They gained an understanding of the purpose of the sea ice stations as well as the processes of the sea ice itself over a winter to spring period.

Sea ice, snow conditions and information gained through monitoring stations were disseminated to the community through the local radio station, bulletins, social networking sites and word of mouth. This provided many different ways to try to reach as many community members as possible every week. The information is always available from Sikumiut Environmental Inc. as well. It has been documented that many residents rely on this information on a weekly basis.

Acknowledgments

Thank you to Sikumiut Environmental Inc. and the communities of Nain and Hopedale. This community based research program also benefited from related funding from Health Canada, International Polar Year, ArcticNet and Aboriginal Affairs and Northern Development Canada.



Clyde River, Nunavut

COMMUNITY PROFILE

Location: Nunavut
2011 Census Population: 934
2011 Census Land Area (square km): 106.55

PROJECT INFORMATION:

Title: "The Meaning of Ice: A special book project to report Inuit-led research on sea ice, sea ice use, and sea ice change in three Arctic communities"
Year Funded: 2008-2009
Area of Research: Ice Monitoring

CONTACT INFORMATION:

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Title: "The Meaning of Ice: A special book project to report Inuit-led research on sea ice, sea ice use, and sea ice change in three Arctic communities"

Project Summary: How We Are Leading the Way

This project contributed to the preparation of a book stemming from the results of an existing project called the "Siku-Inuit-Hila (Sea Ice-People-Weather) Project". Siku-Inuit-Hila was a unique project conducted during the International Polar Year (IPY) that brought Inuit from three Arctic countries together with scientists to study sea ice, sea ice use, and sea ice changes in three different Arctic communities. Inuit from Clyde River, Nunavut, Inughuit from Qaanaaq, Greenland, and Iñupiat from Barrow, Alaska, partnered with climatologists, geographers, and a sea ice physicist to conduct a research project that brought together the diverse knowledge and perspectives of all these experts on sea ice.

The major outcome of this research is the creation of a book called *The Meaning of Ice*, to be published by the International Polar Institute Press in 2012. *The Meaning of Ice* was written together by hunters, Elders, whalers, and researchers, and weaves together the story of human relationships with sea ice including sea ice use, impacts of environmental changes, personal stories, and emotional connections.

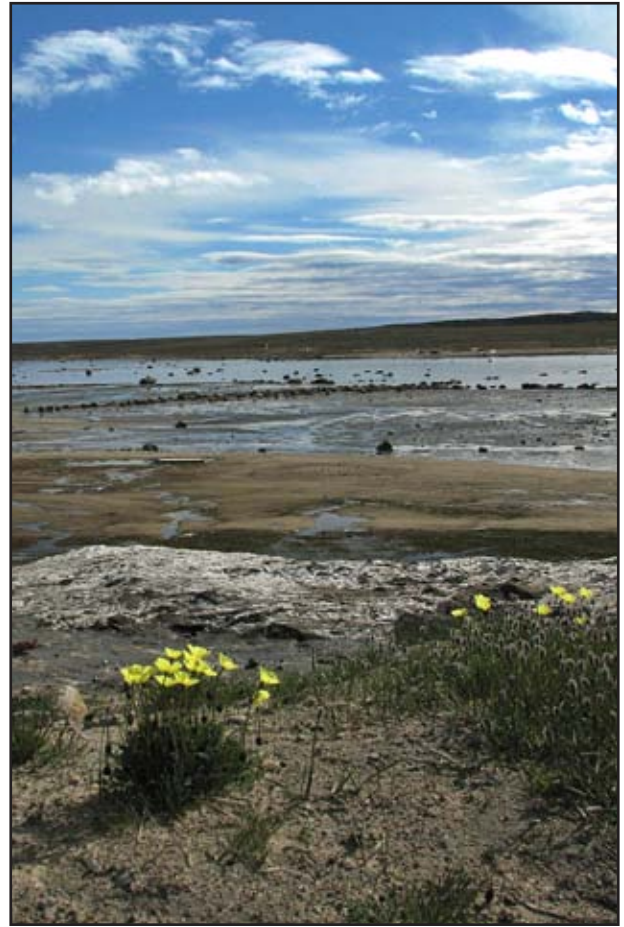


Capacity Building – Connecting the Guidance of the Past with the Needs of Today

Activities

Writing workshops

Writing workshops that complemented the main research were held in each participating community where local sea ice experts groups (sikulirijit) met for several days of mapping and discussing sea ice. Many of the activities led to the documentation of sea ice use and changes related to health, such as changes in sea ice safety, changes in hunting areas and trails, and how to safely use sea ice or build proper sea ice tools. The meetings also included discussions about the emotional connections to sea ice and how it is important to Inuit mental health. Questions around Inuit identity were explored and commented on, as well as how Inuit emotionally and practically respond to sea ice changes.



Skill(s) Building

Each participant had the opportunity to become comfortable with the use of maps and at creating map overlays to communicate information. Local artists gained capacity in illustration work and many expressed surprise and gratitude because they themselves learned knowledge about sea ice they had not known before. Indeed the process of working on the book was just as important as the material in it.

Graphical Material

One of the greatest successes of this project was the development of the graphical material included in *The Meaning of Ice*. Local artists created artwork illustrating sea ice tools, clothing, activities, types of sea ice, and stories. Over the course of the research the project generated:

1. Over 100 illustrations by local artists and illustrators
2. Four illustrations by professional artist Dorothea Rohner
3. Over 20 maps (created by local experts and formalized by professional cartographers).
4. Over 50 pieces of artwork by local children

Next Steps – How We Are Adapting to Climate Change

Reaching Out - The Meaning of Ice

The Meaning of Ice will be published in 2012 and distributed to all major Inuit and Arctic Indigenous organizations, as well as Arctic College, the University of the Arctic, and other Arctic educational institutes and schools. The book will be colour, large format, and available for purchase by the public. The book will gain significant exposure in the North through our existing partnerships with three countries and also in presentations at scientific conferences and northern meetings. The first publication of *The Meaning of Ice* will be in English (with Inuktitut and Greenlandic throughout), with Inuktitut and Greenlandic versions to follow.

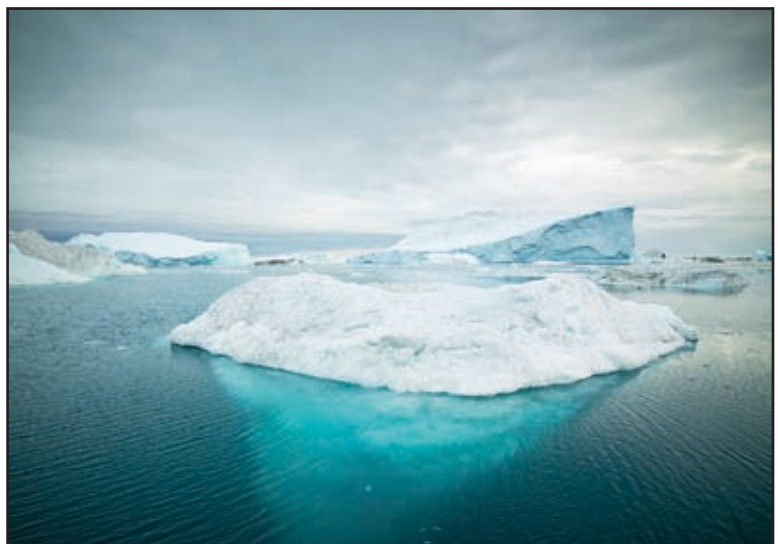


Water Quality

“The rapid change in temperature is expected to impact the biodiversity and hydrology of Arctic streams and rivers.” - Intergovernmental Panel on Climate Change (IPCC)

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 (Jamal Shirley, 2010 NRI Climate Change and Health Adaptation Final Report).

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 two projects focused on water quality. The Inuvialuit Settlement Region and Nunavut projects tell stories on how they've lead 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 towards the development of adaptive public health responses to climate change impacts on water quality.



Nunavut Research Institute – Iqaluit, Nunavut

COMMUNITY PROFILE

2011 Census Population: 6199
2011 Census Land Area (square km): 52.50
Website: <http://www.city.iqaluit.nu.ca/>

CONTACT INFORMATION:

Jamal Shirley
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Box 1720, Iqaluit, Nunavut, X0A-0H0
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PROJECT INFORMATION:

Title: “Building Local Capacity to Monitor Microbiological Water Quality in the Streams and Rivers of Iqaluit Nunavut: towards protecting drinking water resources in a changing climate”
Year Funded: 2009-2010
Area of Research: Water Quality



Title: “Building Local Capacity to Monitor Microbiological Water Quality in the Streams and Rivers of Iqaluit Nunavut: towards protecting drinking water resources in a changing climate”

Background

Many Inuit in Nunavut still prefer to collect their drinking water directly from rivers, lakes, ponds, streams, and even from icebergs and sea ice. Water from these traditional sources is considered by many to be better tasting, cleaner, and superior in quality to treated tap water. A wide variety of microorganisms can exist in surface waters and the microbial diversity of Arctic water bodies could change in the future as new species move northward. Treated water distributed through Nunavut’s community drinking water systems is tested regularly but very little is known about microbial condition of the many lakes, rivers and streams that are used as sources of untreated drinking water.

Most microorganism pathogens in surface water are very difficult, costly, and time consuming to measure. Defined substrate technology (DST) kits allows for rapid detection and enumeration of indicator bacteria in surface water without the requirement to culture bacteria. DST testing is widely utilized by accredited laboratories across North America and has been recommended as a tool for water quality monitoring in Inuit communities.

The Nunavut Research Institute received funding under Health Canada’s *Climate and Health Adaptation in Northern First Nations and Inuit Communities Program* in 2009 to use DST kits to monitor surface water quality of two rivers: the Apex (Niaqungut) and the Sylvia Grinnel. Iqaluit residents collected drinking water from both rivers throughout the ice free period. Our project had 2 goals:



Leia Sowdloapik-Cunningham holding Colisure Tray and UV light used for *E. coli* detection



Arctic College Environmental Technology Program Student David Nakasuk records field data at Apex River

1. To determine whether the Nunavut Research Institute staff and local college students could carry out DST tests reliably and effectively; and
2. To describe the trend in bacteria levels and water temperature over the course of the open water period in both rivers and identify the timing of peak bacteria levels.

Collecting and Testing the Water Samples

Water samples were collected regularly from Apex and Sylvia Grinnel rivers from June 17 to October 13, 2009 at sites where residents typically collect drinking water. Samples were tested at the NRI water quality laboratory in Iqaluit using the DST test kits *Colisure*[™] (for Total Coliforms and *Escherichia coli*), and *Enterolert*[™] (for Enterococci). NRI summer student Leia Sowdloapik-Cunningham (now Nunavut's first Inuk veterinarian) participated in, and eventually led, the sample collection and testing. The DST testing procedure (inoculating, incubating samples) was very straightforward, and the test results were clear and easy to interpret. No Total Coliforms, *E. coli* or Enterococci were detected in any of the field and lab blanks tested.

What We Learned

Total Coliforms were detected in all 38 samples tested from Apex River, and in all 23 samples tested from Sylvia Grinnell. The average Total Coliforms in the smaller Apex River (catchment size = 60km²) was 208 colony forming units (cfu) per 100ml (n=38, Standard error = 26 cfu/100ml) while the average in larger Sylvia Grinnell River (catchment size = 3000km²) was 101.7 cfu/100ml (n=23, Standard error= 13 cfu/100ml). The range of Total Coliform concentrations in Apex River (16 to 547 cfu/100ml) was greater than in Sylvia Grinnell (19.9 to 189.2 cfu/100ml).

Peak concentrations of Total Coliform concentrations in both rivers were observed in late July when water temperatures were highest. The range and variability of Total Coliform concentrations was also greatest in late July in both rivers; greater sample frequency might be required for monitoring during the peak summer period. Total Coliform concentrations were lower in the early summer (mid June to mid July) and in the early fall (late August to early October) compared to mid summer (July). The lowest Total Coliform concentration in both rivers was observed on the last day of sampling (October 13) when water temperature was also lowest in both rivers.

Only two samples (8%) from Sylvia Grinnell tested positive for *E. coli*; both samples had only 1 cfu/100ml of *E. coli*. *E. coli* was detected in 6 (16%) of the samples from Apex river at levels ranging from 1 to 5.2 CFU/100ml; the highest *E. coli* level in Apex was detected on July 28.

No Enterococci were detected in any of the samples from Apex or Sylvia Grinnell.

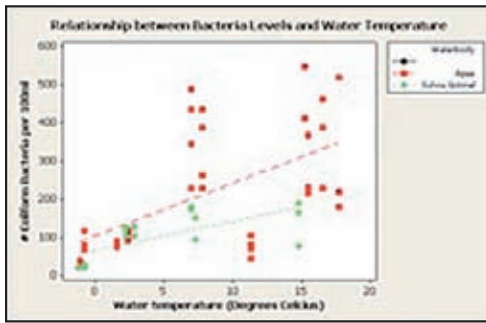


Figure 1.

This graph shows the concentrations of total coliforms in relation to water temperature at the time of sampling (red dots indicate the coliform concentration of individual samples); coliform concentrations were positively correlated with water temperature in both rivers, meaning that coliform concentrations increased as water temperature increased. The relationship between coliform levels and water temperature was slightly stronger in Apex river than in Sylvia Grinnel River.

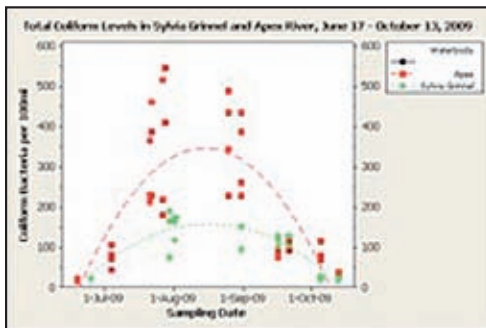


Figure 2.

This graph tracks concentrations of total coliforms in both rivers over the course of the sampling period, June to October (red dots indicate the concentrations in individual samples tested). Note that in both rivers coliform concentrations started low, then steadily increased to a peak in late July (when water temperatures were highest). The concentrations then began to decline; lowest concentrations in both rivers were measured at the end of the sampling period.

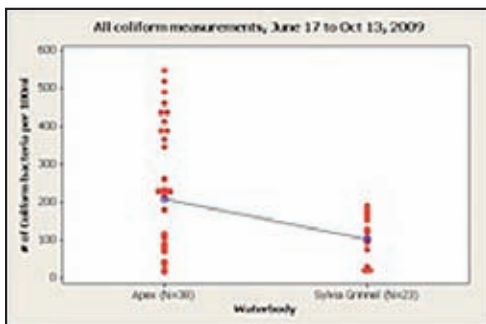


Figure 3.

This graph shows the range of coliform concentrations in samples from Apex and Sylvia Grinnel rivers. A wider range of coliform concentrations was detected in Apex River than in Sylvia Grinnel River.

Communications and Follow Up

An information bulletin in English and Inuktitut with photographs and a description of the project methods was featured on the Nunavut Arctic College website in August 2009. The print edition of Nunavut News North also ran a short story on the project in July 2009. We also periodically reported our test results to the Nunavut Department of Health (Environmental Health Division) and to the City of Iqaluit (Public Works and Planning and Lands Divisions). The City of Iqaluit's Public Works Division used our study results in their application to the Nunavut Water Board for renewal of Iqaluit's municipal water license for 2011. The final project report was circulated to the other agencies that provided support letters for the project. Results will be presented in person to the Iqaluit municipal council in 2012.

We continued to monitor *E. coli* and Total Coliform concentrations in Apex River in 2010 and 2011 to further track seasonal variations and to better understand how bacteria levels relate to water temperature during the ice free period. Our experience to date suggests that with basic training and the necessary equipment, community members are able to conduct reliable, accurate, consistent monitoring of microbial water quality using DST test kits. We hope to continue annual monitoring at Apex River with participation of Arctic College students, and to examine other complex environmental factors (e.g. turbidity, precipitation, pH, conductivity, and substrate) that might influence microbial water quality.

Guidelines for Canadian Drinking Water Quality

(Health Canada, 2012)

Parameter (approval)	Guideline	Common sources	Health considerations	Applying the guideline
<i>Escherichia coli</i> (<i>E. coli</i>) (2006)	MAC: None detectable per 100 mL	Human and animal faeces	The presence of <i>E. coli</i> indicates recent faecal contamination and the potential presence of microorganisms capable of causing gastrointestinal illnesses; pathogens in human and animal faeces pose the most immediate danger to public health.	<i>E. coli</i> is used as an indicator of the microbiological safety of drinking water; if detected, enteric pathogens may also be present.
Total coliforms (2006)	<p><i>At exit of municipal treatment plant or throughout semi-public systems:</i> MAC of none detectable/100 mL</p> <p><i>In municipal distribution systems:</i> No consecutive samples or no more than 10% of samples should contain total coliforms</p>	Human and animal faeces; naturally occurring in water, soil and vegetation	Total coliforms are not used as indicators of potential health effects from pathogenic microorganisms; they are used as an operational tool to determine how well the drinking water treatment system is operating.	In water leaving a treatment plant, the presence of total coliforms indicates that the water has been inadequately treated and may contain pathogenic microorganisms; in semi-public systems, the presence of total coliforms generally indicates that the system is vulnerable to contamination and that additional actions need to be taken; in a distribution and storage system, detection of total coliforms can indicate regrowth of the bacteria in distribution system biofilms or intrusion of untreated water; thus, exceedances of the distribution system goal should be investigated.



Inuvialuit Regional Corporation, Inuvialuit

COMMUNITY PROFILE

Location: Inuvialuit
2006 Census Population: 6184
Land Area (square km): 52.34

CONTACT INFORMATION:

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PROJECT INFORMATION:

Title: "Monitoring and Surveillance of Water Borne Diseases in the Inuvialuit Settlement Region: Adapting to a Changing Climate in the North"
Year Funded: 2009-2010
Area of Research: Water Quality



Title: Monitoring and Surveillance of Water-Borne Diseases in the Inuvialuit Settlement Region: adapting to a changing climate in the North.

Abstract from Pan-Arctic Results Workshop – Ottawa, Feb 7-10, 2011

The Inuvialuit Settlement Region (ISR) sits above the 68th parallel and related climate changes are already present. Specifically, changing water temperatures are causing shifts to aquatic ecosystems. In addition, melting permafrost on the riverbanks could cause additional release of contaminants into water sources. Microbes and contaminants, which may be present in water sources and are relevant to human health, may be impacted by the ongoing changes related to climate. An understanding of the microbes and contaminants relevant to human health, and measurement of the prevalence in water sources, is required so that appropriate public health responses may be planned and implemented.



This project had two goals. The first goal was to collect samples from water sources in three communities in the Inuvialuit Settlement Region Aklavik, Tuktoyaktuk and Ulukhaktok to identify microbes and contaminants that might have been present. Within these communities, short interviews were also conducted with Elders, to identify any concerns around water quality, and to determine their views on how climate change may be affecting the waters of their homelands. The second goal includes an educational component. During the Inuvialuit Regional Corporation (IRC) Youth Town Hall Forum on Education in Inuvik, presentations on water quality and discussion groups were held with youth from ISR communities. A primary focus for the educational component was to introduce youth to the concept of stewardship, and their future responsibilities.



Building Capacity

Beyond Community Funded Projects

Workshops

Climate Change and Health Pan Arctic Results Workshop – February 7-10, 2011

Location: Ottawa, Ontario

This important workshop held February 8 -10, 2011 in Ottawa brought together researchers from across the Canadian Arctic. Community-based researchers, Elders, and youth came together for the first time to share their findings from a climate change research initiatives funded by Health Canada.



Leader on climate change and human rights *Sheila Watt*

They came to share their experiences, their research findings and to strategize for the future with university partners and policy makers. They discussed the many climate change and health research projects that have been taking place in communities and regions across the Canadian north.

Over the past several years, researchers and communities have been documenting changes to plants, animals, land, and water in Canada's Arctic. Both the scientists and the northern people are reporting profound changes such as melting ice and

thawing permafrost, forest fires, warmer temperatures, and changing weather patterns. These changes have both a direct and indirect impact on the health and well-being of the people in the north. The purpose of the Health Canada Initiative was to promote northern participation in monitoring, discussing, advocating, and participation in adaptation to the changing environment. The workshop highlighted research from the 36 projects funded across the north. Further information on the workshop and each of the projects can be found at <http://csch.ca/workshop/>.



Capacity Building and Knowledge Sharing Workshops

Over the past five years, Health Canada's Climate Change and Health Adaptation Program has conducted a series of capacity building and knowledge sharing workshops in the Yukon, Northwest Territories, Nunavut and Ottawa for Inuit and northern First Nation community members, governments and organizations. The purpose of the workshops was to share experiences and knowledge on climate change and health issues that communities are facing and to discuss how they can address these issues. It was also a time for participants to learn about Health Canada's funding program, ask questions, and work on actual 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.



Conclusions

Lessons Learned and Challenges

The Climate Change and Health Adaptation Program, like any new program, has had its share of valuable lessons learned. The most valuable lesson of the last four years has been the importance of developing and maintaining partnerships. This is a program for Northerners, and the program wishes to ensure that the final decisions on who receives funding should be decided by Northerners. Our First Nations and Inuit Selection Committee members have been essential in the success of the program. Not only do they provide essential expertise and advice while reviewing proposals, many of our members promote the program in their communities, in their region and abroad. Program staff have been able to visit and spend valuable time in many Northern communities through invitations by committee members. The intention of the program is to support the many First Nations and Inuit voices in conducting climate change and health research.

The lessons learned have enabled many to gain knowledge and grow in a way to better meet the needs of Northerners in research. The program will continue to grow and will do so only with strong partnership, respect, and support.





Moving Forward

Each year the request for funding from First Nations and Inuit communities has increased. The program has been successful in securing funds of \$10 million over five years until March 2016 as part of the Adaptation Theme of the Government of Canada's Clean Air Agenda. The program is planning to fund at least 50 additional projects over this timeframe.



Future plans are being discussed to expand our dissemination of this report and other climate change and health adaptation related information via social media platforms.

Saying Thanks



Communities, Aboriginal organizations, and non-Aboriginal organizations:

Assembly of First Nations, Inuit Tapiriit Kanatami, Council of Yukon First Nations, Dene Nation, Gwich'in Council International, Arctic Institute of Community-Based Research – Yukon, Institute for Circumpolar Health Research, Qaujigiartiit Health Research Centre – Nunavut, Nunavut Research Institute, Yukon College, Aurora College, Ecology North, Makivik Corporation, Nunastivut Government, Northern Climate Exchange, ELOKA Arctic Athabaskan Council, Inuvialuit Regional Corporation, Nasivvik, Ecology North, Inuit Research Advisors.



Universities: Memorial University, Mount Allison University, Université Laval, McGill University, Carleton University, University of Ottawa, Queen's University, Trent University, University of Toronto, University of Manitoba, University of Alberta, University of Northern British Columbia, University of Victoria;



Federal departments: Aboriginal Affairs and Northern Development Canada, Health Canada (Healthy Environments and Consumer Safety Branch), Natural Resources Canada, Environment Canada, the Public Health Agency of Canada, Fisheries and Oceans Canada and Foreign Affairs and International Trade.

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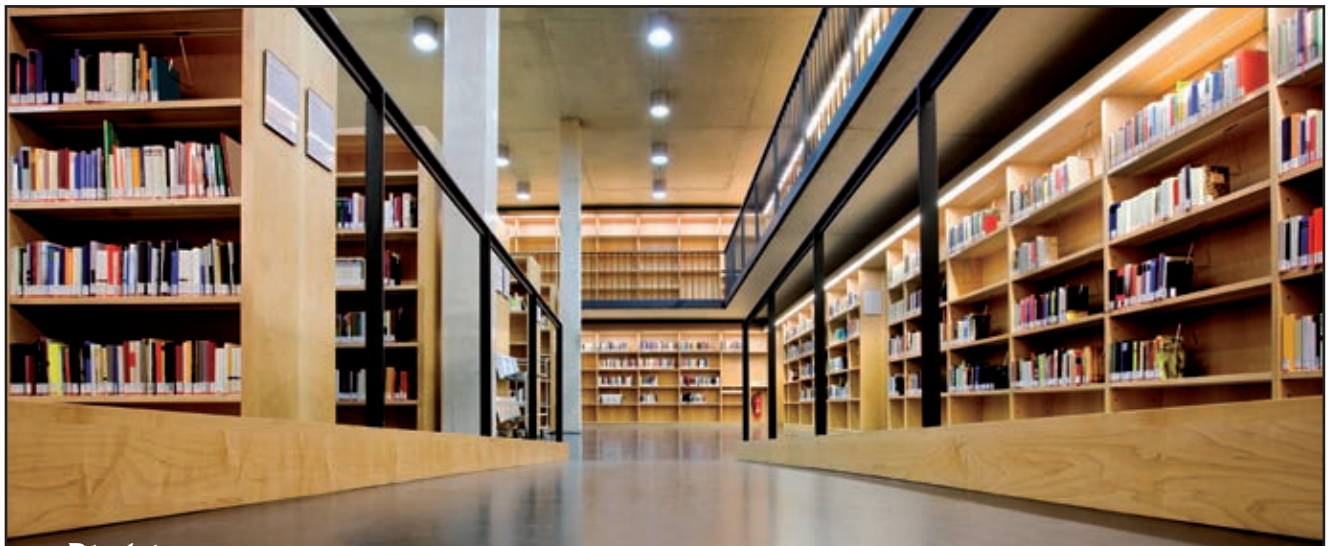
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Disclaimer

This document presents results of the climate change program from the voices of communities who received funding under the program. The results do not necessarily reflect the positions on Health Canada.



Health Canada is the federal department responsible for helping the people of Canada maintain and improve their health. We assess the safety of drugs and many consumer products, help improve the safety of food, and provide information to Canadians to help them make healthy decisions. We provide health services to First Nations people and to Inuit communities. We work with the provinces and territories to ensure our health care system serves the needs of Canadians.

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