

Staying Strong

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

Volume I: Final Report



Prepared by

Tee Lim

with

ʔehdzo Got'ıne Gots'ė Nákedı
(Sahtú Renewable Resources Board)
and The Pembina Institute

December 2014 edition



Staying Strong:

Sahtú Youth and elders Building Healthy Communities in the Face of Climate Change

Prepared by

Tee Lim

with

ᑭehdzo Got'ine Gots'ë Nákedı
(Sahtú Renewable Resources Board)

and

The Pembina Institute

December 2014 edition

Funding provided by

Health Canada

Climate Change and Health Adaptation Program for
Northern First Nations and Inuit Communities 2013-2014



Health
Canada

Staying Strong: Sahtú Youth and elders Building Healthy Communities in the Face of Climate Change ©?ehdzo Got'ine Gots'é Nákedı (Sahtú Renewable Resources Board)
December 2014 edition

Prepared by Tee Lim, with the ?ehdzo Got'ine Gots'é Nákedı and The Pembina Institute

Cover photo by Jean Polfus

Partners:

The five ?ehdzo Got'ine of the Sahtú Region:

Colville Lake ?ehdzo Got'ine

Déline ?ehdzo Got'ine

Fort Good Hope ?ehdzo Got'ine

Norman Wells ?ehdzo Got'ine

Tulít'a ?ehdzo Got'ine

Funder:

Health Canada

Climate Change and Health Adaptation Program for Northern First Nations and Inuit Communities 2013-14

?ehdzo Got'ine Gots'é Nákedı

Sahtú Renewable Resources Board

P.O. Box 134

Tulít'a, NT Canada X0E 0K0

867-588-4040

info@srrb.nt.ca

www.srrb.nt.ca

This document does not constitute the opinions of the ?ehdzo Got'ine Gots'é Nákedı (Sahtú Renewable Resources Board), partnering ?ehdzo Got'ine (Renewable Resources Councils), sponsors or other partners.

Executive Summary

The Tulít'a Dene and Métis are resilient people who have always had to adapt to a challenging climate and waves of significant social, cultural, economic and other changes over the past two centuries. In the past fifty years, the northern Northwest Territories (NWT) has been warming a rate much greater than the global average. In the Sahtú Region, mean annual temperatures are expected to rise significantly into the future. Already, the impacts of climate change have been seen to affect travel out on the land, as well as wildlife and associated harvesting practices and food security. Together with the environmental and socio-economic changes that oil and gas activity in the region may bring, the pace and scale of the changes facing Tulít'a may be stretching local adaptive capacities.

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

The project explored the following questions from a community perspective:

- What can we learn from other Sahtú communities that have investigated the health risks associated with climate change?
- What can we learn from the knowledge of elders/harvesters (women and men) as well as the knowledge of western scientists that will help us protect our health amidst a rapidly changing climate?
- What specific adaptation strategies and actions should our community adopt to protect our health from climate change-related impacts?
- How can we creatively communicate our adaptation ideas to the rest of the community and to others outside the community, so people will listen and support our efforts?

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

options in the community of Tulít'a. However, rather than focusing exclusively on climate change, it was found that participants more often situated climatic changes within a broader discussion of ecological, social and cultural changes being experienced in Tulít'a and the Sahtú – including the resource exploration activity taking place in the region.

An emphasis was also placed on traditional knowledge in the discussion of climate change impacts and adaptation measures in Tulít'a and the Sahtú. Stories and observations of climatic and other environmental changes told here included predictions of warming temperatures, and experiences with permafrost degradation, changing wildlife patterns, and new challenges in travelling out on the land. A central theme that was raised repeatedly by participating elders and youth as both a source of community vulnerability and potential resilience was Dene language, identity, traditional knowledge, stories and way of life, including the land upon which many of these things are based.

A significant breakthrough of this project, therefore, was the facilitation of the transmission of Traditional and other forms of knowledge not only from elders to youth, but from youth to elders also. On-the-land and language and cultural revitalization programming have been strongly identified as means of protecting the health of Tulít'a and other Sahtú communities from the impacts of climate and environmental change. As well, further efforts to support the agency and self-determination of Sahtú communities, including greater information and consultation on resource development projects, and improved access to healthcare, is warranted.

An outgrowth of the *Staying Strong* project is a regional youth initiative for 2014-2015 sponsored by Health Canada to develop specific adaptation strategies and actions that Sahtú communities, entitled *Establishing a Sahtú Youth Network for a Regional Action Plan on the Health Impacts of Climate Change*.

Contents

EXECUTIVE SUMMARY III

1. INTRODUCTION 1

2. RESEARCH BACKGROUND 5

3. METHODOLOGY 9

4. ACTIVITIES AND ANALYSIS 11

5. RESULTS 23

6. CONCLUSION 36

7. REFERENCES 38

Appendices

- Appendix A – *Piet’ánejo: the 2013 Tulít’a Fall Community Hunt*
- Appendix B - *Tulít’a Community Spring Hunt at K’áalq Túé (Willow Lake)*
- Appendix C – Climate Change and Community Health Workshop Materials
- Appendix D – Tulít’a Focus Group Questions (March, 2014)
- Appendix E – Climate change in the Sahtú Region

1. Introduction

1.1. Purpose

This project sought to engage young people in Tulít'a and the Sahtú to take the lead on researching several issues relevant to human health impacts of climate change that affect their communities, including: warmer and more unpredictable weather patterns, travel safety, decreased access to country foods, food security, and risks to cultural health and people's relationship with the land.

Youth participated in the research with input and guidance from elders from Tulít'a and across the Sahtú, as well as the Project Team. As the future leaders of their communities and those who will be most affected by climate change in the decades ahead, the project gave youth a solid foundation in both traditional knowledge and climate science, expanded their creative abilities to communicate and solve problems, and connected them with other motivated youth, knowledgeable elders and resource people from across the North.

The project explored the following questions from a community perspective:

- What can we learn from other Sahtú communities that have investigated the health risks associated with climate change?
- What can we learn from the knowledge of elders/harvesters (women and men) as well as the knowledge of western scientists that will help us protect our health amidst a rapidly changing climate?
- What specific adaptation strategies and actions should our community adopt to protect our health from climate change-related impacts?
- How can we creatively communicate our adaptation ideas to the rest of the community and to others outside the community, so people will listen and support our efforts?

1.2. Objectives

The short-term objectives for the project were:

1. Identify key "old time stories" or narratives that will help the youth and the rest of the community understand how to deal with environmental change and uncertainty, and how to promote optimal mental/social/cultural/physical health.
2. Provide a forum for respectful cross-cultural learning between traditional knowledge experts, youth, climate scientists, and health practitioners, to equip people in Tulít'a

with a fuller and more integrated understanding of climate change in the present and what to expect in the future.

3. Learn from the successes and challenges of previous climate change and health adaptation projects in Fort Good Hope and Délı̄ne, both in terms of the content and the methods used.
4. Strengthen the relationships of Tulít'a youth to their land, culture and elders, to provide a foundation for a better understanding of climate change.
5. Develop leadership skills of Tulít'a youth through their participation in the Young Leaders' Summit on Northern Climate Change and their presentations to the community and regional organizations about their ideas for adaptation and health promotion.
6. Develop youth creativity and communication skills through a workshop and presentations in a communication medium of their choice (digital storytelling, photovoice, theatre, hip-hop, radio podcasts, etc).
7. Undertake the first steps in climate change adaptation planning for Tulít'a, by assessing adaptive capacity, identifying key vulnerabilities that affect human health and compiling ideas from the youth for actively addressing those vulnerabilities.

The long-term objectives of this project are:

1. Establish the foundation for health programs that proactively address climate change and reflect the holism of Dene stories.
2. Establish the foundation for more comprehensive climate change adaptation planning by Tulít'a that will be incorporated into local policy and decision-making.
3. Build relationships of mutual support between elders and youth that are rooted in strong relationships with the land.
4. Give youth the tools to make healthy choices in their lives, to develop a healthy relationship with their land and culture, and to develop the knowledge and confidence needed to face a future of unprecedented climate change.
5. Further Tulít'a's efforts to be self-determining – both in environmental / resource management and in creating policies and strategies to promote health in the community.
6. Build the foundation for a support network amongst Sahtú communities and between Tulít'a youth and other Northern youth, to help strengthen all of our communities' resilience in effectively addressing the challenge of health risks associated with climate change.

1.3. Community background

Tulít'a is home to the Shúhtagot'ı̄ne (Mountain Dene people), Dégot'ı̄ne (River People) and K'áalogot'ı̄ne (Willow Lake people), who currently make up about 80% of the local population, along with the Métis who make up about 10%, and the non-Aboriginal population who are the remaining 10%. The population of Tulít'a in 2011 was 552.

Tulít'a (formerly Fort Norman) is named for its location where the Great Bear River flows into Deh Cho/Mackenzie River, "where the waters meet." Great Bear River is the

Dene travel route to Great Bear Lake, where people of the Sahtú Region travel to hunt, mainly for caribou. Since ancient times, people would camp at Tulít'a across from the huge limestone rock face known as Pətenizá (Bear Rock). This rock is one of the symbols of legendary Dene hero Yamózhá's travels across the landscape and how he managed to carve a world ordered by Dene law out of a chaotic landscape. This symbol is so important to Dene people as a whole that it has been adopted as the logo of the Dene Nation. It is also a symbol of the Dene people's ability to adapt to a changing world after European contact (Protected Areas Strategy 2007). The Northwest Company established a fur trading post at this crossroad in 1810 to encourage trade with peoples south of Fort Good Hope and with the Sahtúot'ine of Great Bear Lake. When the Hudson's Bay Company took over the post, it was relocated several times, but by 1851 it returned to the original site.

The Dene people of Tulít'a are known for having revived the traditional skill of making mooseskin boats. In the spring of 1968, Shúhtagot'ine elder Gabriel Etchinelle led the construction of a mooseskin boat to travel from a camp on Begáhde/Keele River back to Tulít'a. This was the first such boat to be built in decades. It is thought that the boats came into use during the fur trade. Their construction combines the ancient design of the smaller Dene birch and spruce bark canoes, and the shallow, broad and long York boats developed by fur traders in the 19th century to carry large loads. Traditionally, people would travel up into the mountains in the winter, to the headwaters of Begáhde/Keele River. There they would hunt caribou migrating towards spring calving grounds in the area they call Shúhtagot'ine Néné, the Central Mackenzie Mountains. After spending several months building mooseskin boats, they would load all their drymeat, furs, supplies, tents, dogs, and families into the boats in July and navigate down the river to Tulít'a. Elders were always consulted on the timing of departure, based on their knowledge of spring flood patterns and dangerous conditions on the river (Andrew et al 2008).

1.4. Project Team

Tee Lim, MA, Analyst, of the Yellowknife Pembina Institute office.

Dr. Deborah Simmons, PhD, Executive Director, Sahtú Renewable Resources Board.

Eugene Boulanger (Tulít'a Shúhtagot'ine), facilitator.

Leon Andrew, interpreter facilitator.

Tom-Pierre Frappé-Sénéclauze, MSc, climate scientist and Technical and Policy Advisor, Pembina Institute.

Joseph Hanlon, Program Coordinator of the Sahtú Renewable Resources Board.

Youth community researchers

A number of youth from Tulít'a played an important role throughout various aspects of this project. Reanna Campbell was employed as the ʔehdzo Got'ıne Gots'ę Nákedı's Health and Climate Change Research Coordinator Intern for the majority of the project. The two other youth who participated in significant research and coordination capacities were Archie Erigaktuk and Angela Bernarde. The invaluable work and input and these three and all of the other youth participants is acknowledged.

ʔehdzo Got'ıne Gots'ę Nákedı (Sahtú Renewable Resources Board)

The ʔehdzo Got'ıne Gots'ę Nákedı is “the main instrument of wildlife management” in the Sahtú Region (Section 13.8.1[a]), with responsibilities related to wildlife, habitat and ne k'ə edeghálats'ereda (harvesting). The Board must act in the public interest; however, a special place is accorded to ʔehdzo Got'ıne co-management partners in research and management related to land claim objectives. Under Section 13.8.32(h), the Board may provide advice to government on plans for training participants in management of wildlife and related economic opportunities.” The Board also provides dene gháonetę (education) and advice related to its mandate that can inform decision-making about exploration and development in Land and Water Board pre-screening processes and environmental assessments.

ʔehdzo Got'ıne (Renewable Resources Councils)

There are ʔehdzo Got'ıne in each of the five Sahtú communities. They are empowered under 13.9.4(b) “to manage, in a manner consistent with legislation and the policies of the Board, the local exercise of participants' rights in ne k'ə edeghálats'ereda (harvesting) including the methods, seasons and location of harvest.” The Board seeks input and participation from ʔehdzo Got'ıne in research and management matters related to its mandate. More information about each of the five ʔehdzo Got'ıne, their mandate and activities can be found at www.srrb.nt.ca.

2. Research Background

2.1. Climate change and health in Tulít'a

The Tulít'a Dene and Métis are resilient people who have always had to adapt to a challenging climate and waves of significant social/cultural/economic change over the past two centuries. Over the past fifty years the northern NWT has warmed by 2 to 2.7 degrees, which is 4 to 5 times greater change than the global average (GNWT, 2011). Scientists at Natural Resources Canada predict that mean annual temperature in the Sahtú Region will rise by between 4 and 8 degrees by the 2050s, with warmer winters in particular (Furgal and Prowse 2008).¹ Combined with other potential environmental and socio-economic changes associated with rapidly expanding oil and gas development in the region, the speed and scale of change facing Tulít'a is placing potential strain on local adaptive capacities.

The people of Tulít'a are potentially vulnerable to climate change because they still rely to a great extent on food from the land. According to the most recent figures from the NWT Bureau of Statistics (2008), 78.5% of the community reported that at least half of the meat they consume is country food; 41.7% hunted or fished; and 12.0% trapped (this number goes up and down from year to year with fur prices). How to sustain this healthy way of life in a context of significant climatic and environmental change is a focus of this study.

Increasing unpredictability in traveling across the land and waterways has also been identified as a potential area of vulnerability. For example, the Bear River ice crossing has gotten a lot more dangerous in recent years, with extended freeze-melt-freeze patterns in the fall and spring. Uncertainties and risks associated with climate change can affect frequency and length of harvesting activities, which has implications for physical, mental and cultural health. Such changes can lead to people being less physically active and eating more store-bought food, which is less nutritious and causes more health problems such as obesity and diabetes. Further, store-bought food is more expensive, with food prices in Tulit'a in 2010 at 178% of the food prices in Yellowknife (NWT Bureau of Stats, 2011), and availability and quality often dependent on weather/transport conditions. Cultural health may also be affected when there is less knowledge-sharing and mutual support between older and younger generations.

¹ An extended discussion on climate change in the Sahtú region is included as Appendix E.

2.2. Rationale

Downing and Cuerrier (2011) have synthesized a large body of research about the impacts of climate change on First Nations and Inuit in Canada, and observe that both researchers and policy-makers first need to understand people's relationship with their land, as well as the link between health, cultural identity and land use. While recognizing the valuable contributions to be made by both traditional knowledge and science (including combinations of the two knowledge systems) in taking effective action on climate change adaptation at the local level, they conclude: "[t]raditional knowledge now more than ever before needs to take the forefront in order for the next generation to understand these changes and adapt to them in a positive way" (Downing and Cuerrier 2011, 59).

Downing and Cuerrier's (2011) suggestions, taken as starting points and retained as a focus of this project, are twofold: 1) from a research and policy perspective, a deeper understanding of Indigenous relationships between land, culture and health is required; and 2) an emphasis on traditional knowledge is warranted in investigating climate change impacts, and in approaches to adaptation, amongst First Nations and Inuit communities in Canada, including Tulít'a.

Many studies to date about the human health implications of climate change in the North have focused on vulnerabilities and resilience or adaptive capacity with respect to natural hazards and food and water security, and have been geographically focused on Arctic regions and Inuit communities (e.g. Chan et al. 2006; Ford, Smit, and Wandel 2006; Ford et al. 2006; Berkes and Jolly 2001; Pedersen 2007; Furgal and Seguin 2006; Furgal et al. 2008; Chapin III et al. 2005; Johansson 2008; Martin et al. 2007).

Cameron (2012, 104) has pointed out that dominant "vulnerability and adaptation" approaches to exploring the human dimensions of climate change in the North, of which the studies mentioned above are frequently characteristic, "risks delimiting the ways in which northern Indigenous perspectives, concerns, and critiques can be heard and can be effective." Further, she observes that conventional vulnerability assessments often frame indigenous peoples in terms of the "local" and "traditional," and exclude discussions of colonialism and broader political/economic processes such as resource development. Moreover, Bravo (2009, 256) asserts that "climate change crisis narratives...like development narratives, are often used to license the intervention of experts in debates about resource management and conservation," suggesting that this can reinforce existing disparities in power and undermine community efforts to be self-determining.

In response, this study has not taken a standard vulnerability assessment approach, though it has included certain aspects such as the identification of potential health impacts of climate change, assessing adaptive capacity, and exploring severity and likelihood/frequency of predicted health impacts (World Health Organization 2003). Seeking to avoid any delimitation, the project has sought to hear northern Indigenous perspectives, concerns and

critiques about the broad issues of health and climate change, on their own terms. Though some bringing together of traditional knowledge and western science took place in the project, care was taken not to decontextualize this knowledge (following Nadasdy 1999) or attempt to fit it into the established categories or frameworks of more conventional vulnerability assessments. Rather than open the door for the intervention of “experts” in determining appropriate adaptive strategies for Tulít'a, this project has taken as its main experts elders, youth and other community members in the Sahtú. In doing so, the two suggestions of Downing and Cuerrier (2011) are taken up. As well, the project has made efforts to ensure that the context in which youth and knowledge holders situate themselves vis-à-vis the causes and effects of climate change were not limited to the "local" or "traditional."

Significantly, answering Cameron's (2012) call, the project also accommodated some discussion of regional resource development as a process reflecting both political-economic and environmental change. As already mentioned, Tulít'a is currently at the centre of a shale oil exploration boom, leaving related issues of environmental change top of mind within the region. It is, evidently, impossible to divorce discussions of health and climate change from discussions about shale oil development and its potential health and environmental implications in such a context.

Health Canada has noted that future climatic projections lack resolution over small geographical areas, and there are major gaps for the Canadian North in particular with regard to both climate change-related data and human health data (Bélanger and Séguin 2008). This project represents one of only a handful that takes a focus on the Dene and Métis communities of Canada's Subarctic regions (notable exceptions include Nesbitt, 2010; Woo et al. 2009; Simmons et al. 2010; Pielak et al. 2013), and therefore makes a contribution to addressing these gaps. While it is the first investigation of climate change in Tulít'a, the project builds upon health and climate change initiatives conducted in recent years in other Sahtú communities. In 2008-09, Fort Good Hope began a project funded by Health Canada called *Our Land, Our Life, Our Future: Community Health, Climate Change and Community Based Adaptation Solutions toward Wellness*, which involved creating and training a Youth Video Research Crew to conduct video interviews with elders, leaders, harvesters and other youth to document experiences of climate change, health impacts and health adaptations. In 2009-10, Délı̄ne also received Health Canada funding for the project *Health Risk and Climate Change in Sahtúot'ine Stories: Envisioning Adaptions with elders and Youth in Déline, NWT*, which explored traditional and contemporary narratives about safe travelling on the land, ways of surviving in changing or unpredictable ecological conditions, and ways that young Dene and elders interact to learn strategies for survival and good health (Simmons et al. 2010).

Chapin III et al. (2005) found that the weakening of cultural ties to traditional and subsistence activities is the most serious cause of decline in health and well-being amongst Aboriginal people in Arctic regions. Similarly, Health Canada has recognized the multi-

faceted nature of health, and that climate change may contribute to the shift away from cultural practices and reliance on country foods, thus exacerbating a decline in mental and physical health (Bélanger and Séguin 2008). While many publications acknowledge the importance of traditional knowledge approaches in climate change monitoring and practical adaptive strategies (Nichols et al. 2004), very few recognize the importance of indigenous narratives in guiding and framing the adaptation approach. There is, however, an extensive literature on the broader role and significance of narratives in indigenous societies (Cruikshank 1998; Hanks, 1996; Legat 2012; Andrews, 1990; Ridington 1988; K. Basso 1984). Furgal et al. identify as a gap in the current research “the status of key elements influencing adaptive capacity and their distribution at the household, community, territorial and regional scales” (2008, 355). Significantly, they do not refer to cultural resources as one of the “key elements.” Subsequently, through the close engagement of community members, this project has emphasized traditional knowledge and narratives conveyed by elders, and the foundational nature of cultural resources and strength in establishing adaptive capacity.

Health Canada has also recognized that the uncertainties associated with future climate change scenarios and effects make it challenging to develop specific adaptation strategies (Bélanger and Séguin 2008). However, Dene and Métis people in the Sahtú have always had to deal with elements of uncertainty when making important decisions to ensure survival, and so traditional ways of knowing and deciding may be important strengths that they bring to climate change adaptation planning. Forty years ago, anthropologist Keith Basso (1972) documented the complex system of decision-making used by the people of Tulít’a to determine whether or not ice was safe to travel on. This project has confirmed that Tulít’a’s adaptive strategies will be strongly rooted in enhancing people’s “knowledge toolkit” (including ways to use traditional knowledge and narratives to address rapid change and risk), so that community members will be prepared to deal with a range of possible scenarios.

3. Methodology

This project was necessarily complex, hybrid and adaptive in design, given the diversity of participants and the cross-disciplinary scope of the questions. A modified collaborative and cross-cultural methodology, including an Action Research aspect, was adopted for the workshops and focus groups. The approach was informed by the Northern tradition in Participatory Action Research that has evolved since the 1950s, notably discussed by anthropologists Joan Ryan and Michael P. Robinson (1990), Robinson (1996). The limits of this approach are discussed in Caine et al. (2007) and McGregor et al. (2010). In the case of this project, time constraints did not allow for full collaboration or participation by community members in all phases of the research. Fortunately, the long term Northern and Sahtú-based research experience of certain Project Team members compensated for this to some extent, ensuring that the process was founded in lessons learned from earlier research.

The cross-cultural aspect of the approach was derived from the experience of Project Team members, as well as a series of discussions with community researchers as described in McGregor et al (2010), and the approach advocated in the newly updated traditional knowledge Research Guidelines published by the Cumulative Environmental Management Association (CEMA) for the oil sands region of northeastern Alberta (Simmons et al. 2012). Efforts were made to adapt to indigenous ways of knowing, and to take indigenous concepts and terminology as the starting point – while recognizing that any discussion of climate change and health would necessitate a bridging of concepts and knowledge from both indigenous and non-indigenous cultures.

Group discussions and interviews alike were semi-structured and qualitative, with the aim of eliciting narratives that could be used to validate and interpret available quantitative data and relevant research results documented in the literature. A “grounded theory” approach to analysis as developed by Glaser (1992) and discussed in Simmons et al. (2012) allowed key categories to arise from the discussions and interviews, as opposed to requiring that participant inputs fit into a preformulated set of categories.

Simmons et al. (2014) observe that the involvement of younger generations in research can support future Dene leadership and self-governance. It is also suggested that "knowledge sharing by elders is usually much enhanced when the principal interlocutors are youth – the narratives are richer, more meaningful, more alive in performance, and often laden with a sense of passion, even urgency" (Simmons et al., 2014, 8).

In terms of learning from other Sahtú communities that have investigated the health risks associated with climate change, a number of methodological considerations were accounted for. Having been closely involved with the *Health Risk and Climate Change in Sahtúot'ine Stories: Envisioning Adaptions with elders and Youth in Déline, NWT* project, Project Team

member Deborah Simmons was able to provide insights and advice in the project design for the work in Tulít'a. The participation of both elders and youth from the previous projects was sought, with only limited success due to availability and other reasons. It was noted that difficulties in reaching former Project Team members from the Fort Good Hope and Délı̄ne work, and difficulties in accessing certain outputs and other materials from previous projects, hindered the ability of this project to fully ground and base itself off the other Sahtú initiatives. There is perhaps a need for a more comprehensive knowledge synthesis in both the Sahtú and across the *Climate Change and Health Adaptation Program for Northern First Nations and Inuit Communities* projects, and improvements to the accessibility of project outputs such as reports and video from previous years.²

One learning from previous projects was reflected in the diversity of methods of the Tulít'a work. Whereas the Fort Good Hope project *Our Land, Our Life, Our Future: Community Health, Climate Change and Community Based Adaptation Solutions toward Wellness* took a video research focus and the Délı̄ne project emphasized narratives and story cycles, the Tulít'a project employed a range of methods, which are described in the following section. In addition, the Tulít'a project was the first of the three to actively involve a climate scientist.

² This could be facilitated through the climatetelling.ca website.

4. Activities and analysis

In order to investigate the research questions and objectives described in Section 1, the Project Team undertook a number of activities, as follows, beginning in September 2013:

4.1. Planning focus group/workshop and school presentation

An initial planning focus group/workshop was held in Tulít'a September 13, 2013. Participants included six knowledge holders (four elders and two harvesters), together with Reanna Campbell, Deborah Simmons and Tee Lim. The discussion focused on the need for careful, advance planning of trips out on the land with groups of youth, which informed the on-the-land learning components of the project (described below).



The planning workshop was immediately followed by a presentation from the group of elders to a group of 24 grade 11/12 science students at the Chief Albert Wright School. The four elders each spoke about their experiences growing up and living out on the land, and spoke also about the changes they had observed in Dene lifestyle and culture.



4.2. On-the-land learning

Community fall hunt at Pietł'ánejo (Caribou Flats)

From September 19-30, 2013, the project supported youth participation of eighteen youth in the Tulít'a community fall hunt at Pietł'ánejo (Caribou Flats), as a means of on-the-land learning, in partnership with the *NWT Time-honoured Aboriginal Actions Sustaining Traditional Eating (TAASTE)* program. This included the involvement of Reanna Campbell and Archie Erigaktuk. While on the fall hunt, the two youth assisted Joe Hanlon in working on this Tulít'a-based program, along with elders, youth and community organizations, on the promotion of traditional foods and lifestyles, towards community wellness. Our Pietł'ánejo team both participated in and supported the high school youth present in learning traditional skills from elders related to the caribou harvest. Sharing circles took place in which youth were taught how to respect animals, and what is expected from them while out on the land. Reanna also worked with elders and youth to talk about ways that the land is changing in response to climate change, and the ways that people can adapt to these changes, with a focus on youth-led responses.

Additional details on the community fall hunt are available in Appendix A: *Pietł'ánejo: the 2013 Tulít'a Fall Community Hunt*. A photo book from the fall hunt at Pietł'ánejo is currently in production, compiling stories and reflections from elders, harvesters and youth who attended, designed by resource person and trip participants Jean Polfus.

PIETŁ'ÁNEJO

A photo book from the fall hunt at Pietł'ánejo is currently in production. Design: Jean Polfus



TULÍ'A FALL HUNT

PIETLĀNEĪO
TRILĪTA TĀLI PĀRINĒ
Copyright © 2014 by the Sārdi Renewable Resources Board
ISBN:
Cover and book design by: Ann Lieppert Peltin
Photographs by: Ann Peltin, Aaga Carlsson

This project was funded by the
Northwest Territories Species at Risk Stewardship Program
<http://www.speciesatrisk.ca> Stewardship Program
Health Canada's Climate Change and Health Adaptation Program
for First Nations and Inuit Communities

State Renewable Resources Board

For more information about Species at Risk (SAR):

Species at Risk Secretariat
Environment and Natural Resources
Government of the Northwest Territories
Yellowknife, NT
www.speciesatrisk.ca
(867) 763-4211
Email: sars@gov.nt.ca

Yellowknife Office: 4th Floor
State Renewable Resources Board
Duke St., NT
www.srb.nt.ca
(867) 551-6540
Email: director@srb.nt.ca

Proceeding photo Aaga Carlsson, following photo spread by Ann Peltin

Printed in CANADA by Phoenix



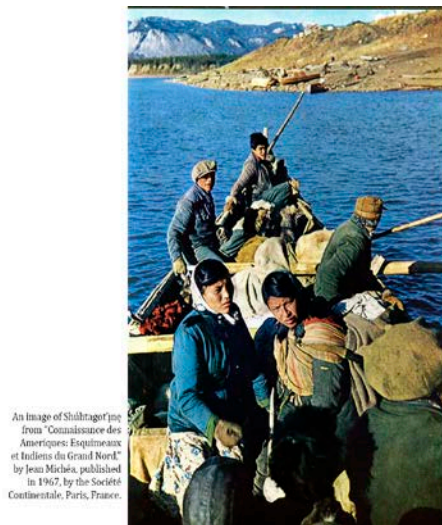
“ NAPOLEON KENNY
Like when I go up there for the beauty of the land, and the animals I see while I'm up there. When I'm up there in the mountains, I see animals up there that I don't see down this way (grizzlies, sheep, and lots of fish in the water).

It's the place to be, that's why I go up lots. I hear a lot of good stories that they tell me. Old stories about how old timer people made moose skin boats and how they use to walk with dogs. They will tell you a story when they see a spot they recall about when they were young.

Uncle Ricky Andrew talks about the old day stories. He always listened to the elders, that's how he learned everything he knows now. He once said:

"Go with me, listen to me. If you listen to me it will bring you long ways. You do something - everything is a choice. The path you go with will bring you where you end up. You can't blame no one but yourself!"

© Ann Peltin



An image of Shūltago'ne from "Commissaire des Amériques: Esquimaux et Indiens du Grand Nord," by Jean Michéa, published in 1967, by the Société Continentale, Paris, France.

BUILDING A MOOSESKIN BOAT

By Maurice Meudo

Sometimes the caribou stay until March and the end of March they're moving back. That's why people move after them. They move the camp after the hunt and then go far way and then they keep going again. Sometimes they have enough drymeat and then they go to Keele River to make a moose skin boat. They move all the meat down there. They make a big cache and they cache the meat there. Then we set up the camp there and go hunt for moose skin. They kill a lot of moose and flesh the hides and then here and then they dry them out. Then when springtime comes they're ready to go and then they push them into the water and soak them. When the hides are wet they take them out and then the women start sewing and making the moose skin boat. I remember a lot of times, I've seen a lot of people working. Only Fred Harrick, John Harrick's uncle made a really good moose skin boat.

Uncle Gabe [Eitchelle] was the best. The rest of us were not too good. Just sloppy. But Uncle Gabe made a good boat. Seven

moose skins. They have to cut a moose skin to fit in. They find the bend tree then they make the keel and they push down and stretch out the moose skin. And then after that they put a rib inside all the way. Then they leave it out and then dry. Really stretch out. But where sew it never breaks. And then they sew this way and then they joined the skins. And then they sew the stow around. I saw them. They were really fine. So when they put in the water it wasn't leaking or nothing.

During that time they make drymeat and then they store all that meat. They don't stink and they put a lot of weight in the boat, but it doesn't sink far. You just put more stuff and it stays level that way in the water. Not like your freighter boat. You overload it and it just goes down. The moose skin boat holds lots. Whole families. Sometimes three families, and all the dogs inside there, too.

41

Community spring hunt at K'áalq Túé (Willow Lake)

In partnership with the Government of the Northwest Territories – Industry, Tourism and Investment *Take a Kid Harvesting* program, the project supported the participation of nine youth from Chief Albert Wright School, as well as team members Tee Lim, Eugene Boulanger and Angela Bernarde, in the Tulít'a community spring hunt, May 3-12, 2014. The trip engaged youth in skills-based traditional knowledge, North Slavey language, and on-the-land trapping, harvesting and survival training. The trip drew heavily on the expertise of harvester guides, qualified local teachers and other K'áalogot'ine (Willow Lake people), including in regards to environmental change and the traditional use of the K'áalq Túé area.

Additional details on the community spring hunt are available in Appendix B: *Report for Growing Forward 2 Take a Kid Harvesting Funding: Tulít'a Community Spring Hunt at K'áalq Túé (Willow Lake)*.

Resource person and trip participant Janna Graham is in the process of producing a short audio documentary (approximately 10 minutes) about K'áalq Túé to air on CKLB radio. There will be an accompanying web release of the story along with photos, most likely in a sound slide format (a story plays while photos pop up). The project was funded by the NWT Arts Council, as a series of radio documentaries about people living and working on the land. Through radio, interviewees have the opportunity to tell their own stories and experiences about K'áalq Túé. It serves as both a record of the camp experience, as well as an exercise in articulating why and how the space is sacred and how traditional skills continue to play a role in the lives of K'áalogot'ine and other Tulít'a community members. Many of the youth participants were interviewed and will feature in the audio documentary.

Learning and developing adaptive strategies out on the land

At both community hunts, youth participants learned a variety of skills and lessons from harvesters, elders and other Knowledge Holders, including how to live on the land, how to respect animals, and how to hunt, prepare and cook a variety of game animals. Both while on the land and in other project activities, the need for youth to attain more traditional skills and knowledge was repeatedly stressed, particularly as a critical source of resilience and means of adapting to environmental and climate change impacts.

Given the potential for climate change to impact the harvesting of traditional foods, discussions led by Reanna Campbell and Joe Hanlon at Piet'ánejo provided the opportunity for youth to hear from elders about changes observed, such as varying water levels, climatic and weather changes, and collapsing river banks. Through this, youth were able to receive advice from their elders on how to ensure safe travel while out on the land, as well as other ways to maintain traditional practices in an environment of change.

Similarly at K'áalq Túé, opportunities for elders and experienced harvesters to provide instruction about safe travel on the land were abundant. Whereas the spring hunt in May

now typically involves the wide use of skidoos, the lack of ice and snow cover this year meant much more travelling and hunting took place on foot. This came after a number of youth got their skidoos stuck in stretches of muskeg and melting ice and snow that could not support travel by snow machine. In one particularly serious incident, a number of adult hunters and advising elders had to coordinate a rescue of two youth who had submerged their skidoo in a deep body of water. Following this incident, all youth hunters were taken aside and warned of the dangers of skidoo travel in the current conditions, and skidoo use was significantly restricted.

- "I didn't realize there would be so many people here... But thank you just the same, the kids especially too from the school, I'm very happy for them to be here. One of the things the elders always talk about is the safety issue in terms of ice. Yesterday I saw some skidoos on the ice, and now there's no ice in some places. My father always told me, you've got to be careful on the ice, never walk on the ice without a good strong pole in your hand that you can use for leverage if you ever go down. That's something we've got to always teach our kids, about safety in terms of ice." - K'áalogot'ine elder Joe Bernarde



Jason Nataway and Wayne McPherson after learning axe safety, preparing walking sticks, and learning how to travel safely over frozen lakes. Photo: Joe Hanlon



elder Gordon Yakelaya leads a group of youth in the safe crossing of lakes in the spring. Photo: Tee Lim/Pembina Institute

Discussions led by Eugene Boulanger and Tee Lim at K'áalq Túé identified a growing generational divide between elders and youth as a source of community vulnerability. Elders spoke to changes in behaviour and attitude amongst youth in the community today, as contrasted to their own experiences growing up. As far as being at a community hunting camp went, this included less take-up of certain responsibilities typically dictated by traditional protocols, including caring for and sharing meals with elders, ensuring elders are well supplied with wood, and general camp activities and maintenance like assisting with the preparation of fresh game for the families of different hunters. This potential deterioration of social cohesion and support networks, in an on-the-land context where externally-provided services are unavailable, is concerning. Elder participants agreed that in order to address these challenges, in educating youth in the traditional protocols that have served their Ancestors for generations, more work was required to create more meaningful opportunities for land-based learning opportunities. It was also widely felt that these lessons cannot be fully imparted in relatively short on-the-land trips and experiences.

In engaging youth in less formal conversations about their perspectives and experiences, many were initially reluctant to share their views, even to fellow youth Eugene Boulanger. However, many did convey a weighty understanding of sociocultural, political and environmental change in Tulít'a and the Sahtú, and how climatic and other changes would likely affect their own lives, as well as the legacies of their Ancestors. Supporting young people in Tulít'a to continue to understand and articulate these complex experiences of social and environmental change, both in town and on the land, is a clear area for further work in developing adaptive capacity. It is also an area welcomed by many participants in this study and other community members. For example, University of Toronto researcher when Rauna Kuokkanen met with a group of community advisors in Tulít'a to discuss the design of a community-based study entitled "Women's Roles in Changing Times," she was given direction to work closely with youth; this was a catalyst for creation of a local youth group that participated in establishment of the Sahtú Youth Network.

4.3. Tulít'a youth participation at PowerShift BC

In the absence of a 2013 Young Leaders' Summit on Northern Climate Change, Tulít'a youths Reanna Campbell and Archie Erigaktuk accompanied Tee Lim to the PowerShift BC climate change gathering in Victoria, BC, October 4-7, 2013. Their participation in the Northern delegation allowed them to:

- Network with other young leaders from the NWT and elsewhere, engaged in climate change issues;
- Participate in the greater Canadian climate movement and strengthen relationships with engaged youth from across the country;
- Enhance knowledge of Canadian climate issues and provide an opportunity to share unique northern perspectives;
- Be exposed to leading voices in the environment and climate justice movements;
- Develop essential skills for change in areas such as communication, campaigns and actions, education, outreach, and research;
- Learn more about Canadian and international policies, impacts, challenges, and solutions pertaining to climate change.

Reanna and Archie also attended and participated in a panel session on climate change and indigenous and youth-led responses in the North, featuring Daniel T'Seleie and Eugene Boulanger from the Sahtú, Kiera-Dawn Kolson, also from the NWT, and Caleb Behn from northeast BC. Reanna and Archie also received mentorship from these well-established northern young leaders.



Northern panel session at PowerShift BC. Photo: Michelle Zakrison



Archie Erigaktuk at PowerShift rally in Victoria, BC. Photo: Reanna Campbell

4.4. Climate Change and Community Health workshop

The *Climate Change and Community Health* workshop was held in Tulít'a, November 5-7, 2013, with 10 elders and 12 youth from all five Sahtú communities, along with facilitators and resource people. The workshop included a combination of presentations and facilitated discussions.

Featured presentations focused on the links between climate change and community health, including connected issues of regional significance such as caribou research and unconventional oil and gas extraction in the Sahtú. Knowledge was exchanged between climate science and health experts, traditional knowledge holders, and youth, from across and outside the Sahtú. Project Team member Archie Erigaktuk reported back to the workshop group on his experiences at Pietł'ánejo and PowerShift BC.

The results of the workshop are discussed at length in Section 5 below. Workshop materials, including the invitation letter, agenda and participant list, is included in Appendix C.



Pembina Institute climate scientist Tom-Pierre Frappé-Sénéclauze presents to the workshop. Photo: Jean Polfus

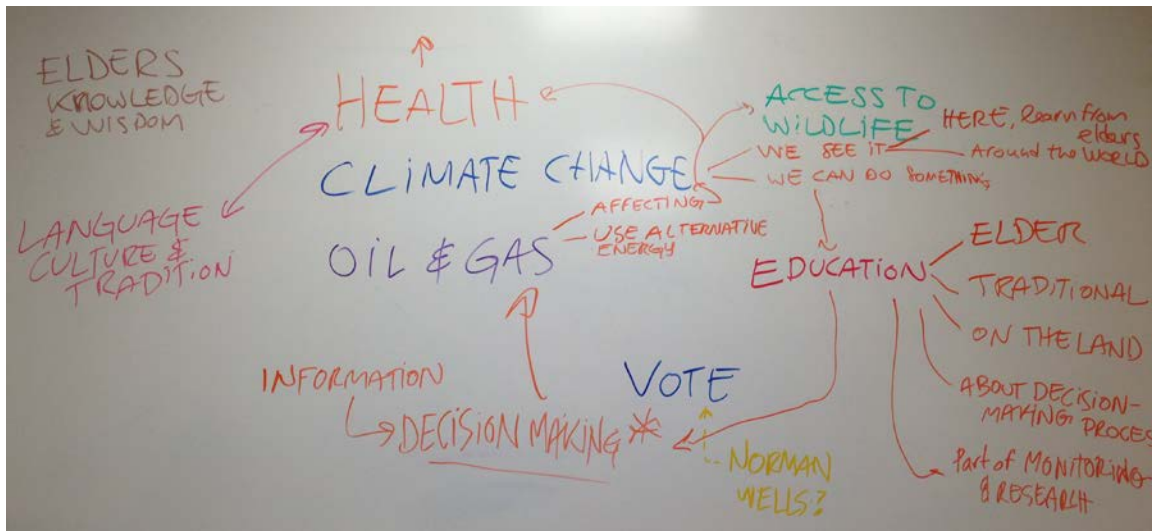


Photo: Tom-Pierre Frappé-Sénéclauze/Pembina Institute

Forum Objectives

To learn from climate science experts and health experts about current risks and future climate change scenarios;

- To learn from traditional knowledge perspectives about changing climate/weather patterns, health and cultural implications;
- To learn from key stories chosen by the elders to teach about environmental change and uncertainty;
- To give young people and elders from across the Sahtú a chance to share their learnings and reflections about previous climate change adaptation projects in their communities.



Youth

breakout group brainstorm. Photo: Tee Lim/Pembina Institute

4.5. Youth-driven community research, engagement and skill-building workshops in Tulít'a

Team member Eugene Boulanger, focusing on youth engagement, facilitation and skill-building, worked with Sahtú youth at the Sahtú Environmental Research Results Workshop in Tulít'a, Nov 27-28, 2013. At this workshop and other project activities, youth frequently outlined a need for greater and more consistent engagement of youth at meetings:

- "We need more young people involved in decision-making processes, going to meetings; people can be sent to meetings in other towns and actively connecting to other youth." – Youth participant at Sahtú Environmental Research Results Workshop

Currently, Sahtú youth are engaged in regional governance processes on a largely ad hoc basis, with no Sahtú-wide youth organization in existence. Generally, at most a single youth representative will be invited from each of the five Sahtú communities to participate in regional meetings by governance bodies such as the Sahtú Dene Council, the Sahtú

Secretariat Incorporated, and constituent district land corporations, as well as co-management boards such as the ʔehdzo Got'ine Gots'é Nákedı. These youth receive little training, preparation, or follow-up support in order to help them meaningfully participate in the meetings. Moreover, youth representatives have few formal opportunities to caucus with their peers from other communities, limiting the exchange of knowledge, information, and potential for collaboration. Consequently, youth are requesting to become more meaningfully involved in decision-making processes in the Sahtú Region.

In March 2014, team members Eugene Boulanger and Tee Lim worked with youth in Tulít'a, expanding on previous discussions around possibilities for a regional youth organization, and exploring ideas around land-based learning opportunities that can draw on both traditional and scientific knowledge bases in understanding and addressing issues relating to such things as climate change, and community health. The youth also participated in a handful of semi-structured interviews with Tulít'a elders and other Knowledge Holders, as a means of validating and developing more in-depth key messages from the previous discussions.

A major output of the work with youth was a commitment to developing a Sahtú Youth Network (which is the basis for the ʔehdzo Got'ine Gots'é Nákedı's *Climate Change and Health Adaptation Program for Northern First Nations and Inuit Communities 2014-15* project), and associated web platform. Significant input from Tulít'a youth was gathered to direct the development of the Sahtú Youth Network website, with youth team members contributing to content development and website design/user experience research.

Overall, participating Tulít'a youth were engaged in training and skill-building opportunities to work in team-based multimedia environments, database creation and maintenance, qualitative research methodologies including interviewing and focus groups, social media management, digital strategy, and public speaking.

4.6. Tulít'a Focus Group

This focus group was held in Tulít'a March 25-27, 2014, in partnership with the *Best of Both Worlds: Sahtú Gonéne T'áadets'enıto – Depending on the Land in the Sahtú Region* project, funded by the Canadian Northern Economic Development Agency and the Government of the Northwest Territories Department of Industry, Tourism and Investment (GNWT-ITI). The focus group was co-facilitated by Tee Lim, Leon Andrew, Eugene Boulanger, Deborah Simmons and Angela Bernarde, and included 12 participants. A key objective was to develop an understanding of the experience of knowledge transfer through on-the-land-based activities.

The results of the focus group are discussed at length in Section 5 below, together with those of the *Climate Change and Community Health Workshop* activity. The questions that provided

structure and focus to the discussions related to the objectives of this project are provided in Appendix D.



Photo: Eugene Boulanger



Photo: Deborah Simmons

5. Results

5.1. Introduction

The following section discusses, in particular, the results of the semi-structured, qualitative group discussion research activities: the *Climate Change and Community Health Workshop*, and the *Tulít'a Focus Group*. It also incorporates some discussion of the interviews conducted. For the reasons discussed in Section 2 “Research Background,” and in order to support the particular mandates of the ʔehdzo Got'ine Gots'é Nákedı and their ʔehdzo Got'ine co-management partners, an emphasis was placed on traditional knowledge in the discussion of climate change impacts and adaptation measures in Tulít'a and the Sahtú.

This results section begins with stories and predictions of climatic and other environmental changes, as told by the Sahtú elders, based on knowledge that had been passed down to them from their own elders and ancestors. This includes predictions of warming temperatures, as well as lessons around the earth as a living entity, and thus the importance of environmental stewardship. What follows then is a range of direct observations and experiences of environmental changes and impacts, including permafrost degradation, river slumping, changing wildlife behaviour, and new difficulties in travelling out on the land. Participants' concerns about the potential impacts of resource development activity, such as oil and gas exploration, is then presented, including the effects of such activity on the land and wildlife. Issues around community agency, self-determination, compensation and benefits are also raised.

The results section concludes with a discussion of areas of vulnerability identified by participants, as well as corresponding areas of resilience and adaptive strategies put forward to address vulnerability and change. A central theme that was raised repeatedly by participating elders and youth as both a source of community vulnerability and potential resilience was Dene language, identity, traditional knowledge, stories and way of life, including the land upon which many of these things are based. It was clear that youth participants were committed to addressing the various challenges facing their communities, recognizing the need to work together with each other and with their elders. A major breakthrough evident in bringing elders and youth together for the project was a heightened awareness amongst youth of the level of support elders were willing to provide them. Amongst elders, a new appreciation of the level of engagement and concern exhibited by the youth participants for their futures and the future of their communities was gained. It was found that

simply bringing elders and youth together, with an interpreter able to translate both ways, was hugely productive in generating cross-generational dialogue.

Finally, youth and elder participants expressed their views on the lack of information and consultation they feel they receive on proposed resource development activities such as hydraulic fracturing, suggesting this is an area of community vulnerability. As such, they called for a slowing in pace of development, and request broader education and consultation around these issues to inform decision-making processes. Briefly, a few suggestions are included about the need for greater access to health resources, in light of potential health implications from climate change and hydraulic fracturing impacts.

5.2. Stories and predictions of change from the ancestors

It was apparent from the group discussions that Sahtú elders possessed significant knowledge of climatic and other environmental changes, based on the stories, predictions and prophecies of their own elders and ancestors. As elder Marie Kochon of Colville Lake stated, "Global warming³ – it's true. It has been predicted by the prophecies of the elders." These stories typically contained some mention of the importance of environmental stewardship to Dene, or else such lessons were derived by the elder workshop participants. As elder Alfred Taniton of Délı̨ne described:

We talk about global warming – it is a phenomenon so strong, how do we handle it? I remember Old Andre in Délı̨ne saying we were heading toward such times... it looks like we're there now. I'm thankful for the global warming presentation [by Tom-Pierre Frappé-Sénéclauze] – through our gifted elders, we already have some knowledge of what's coming in the future. Our knowledge seems compatible.⁴

Elder Thomas Manual of Fort Good Hope shared his grandmother's story of when the traditional camp at Little Chicago was located at Point Separation, suggesting that this was where the ocean tideline was previously. Further, he noted that one elder previously predicted that the ocean would return to Point Separation one day. Alfred Taniton continued that in addition to predictions of rising temperatures, the ancestors and elders used to talk about the earth as a living thing. Referencing oil extraction, Taniton added:

³ While 'climate change' is a more scientifically accurate term, the term generally used by Sahtú elders was 'global warming', so this expression has been retained.

⁴ Quotes have been minimally edited for readability.

The elders talked about oil as the lifeblood of the earth – if you drill the earth, what are you going to do? If we drill it all the earth will dry up. People who drill into the ground, they're drilling into the living earth – they don't know what they're going to do. When the earth doesn't heal anymore, we're in for a hard life.

Elder Maurice Mendo of Tulít'a also conveyed oral history from approximately 200 years ago, when elders had spoken of the future – how things were going to change and develop – which have come about today.

About 200 years ago, elders talked about candles or flickering lights in the bushes, and trees being pushed over. This could be development in or near Norman Wells. This world, and the water, we have to look after it – it's number one. If the water was destroyed or contaminated, how are we going to be happy and survive? Or the wildlife too? The elders talked about our seeing changes in weather patterns, and that if the weather systems swap, it'll be a disaster. The South will get colder and the North warmer, and the South will no longer be able to grow potatoes, corn and other crops. When these elders were predicting, they shouldn't have known these things, but in fact they predicted all of this.

Elder Frank Pierrot of Fort Good Hope reiterated the prediction of the ancestors that global warming would affect future generations, as it being witnessed currently – as well as the theme of concerns for impacts south of 60°: "in the NWT we'll be okay, but there might be some trouble in the South." elder Thomas Manual of Fort Good Hope added that while initially, the North may have some protection from impacts taking place in the South, the ancestors anticipated that adverse effects would follow to the North eventually.

5.2. Direct observations and experiences of change

In addition to the observations and predictions of climatic and other environmental changes transmitted via oral history and stories from the ancestors, elder participants in the project possessed extensive knowledge of such changes and impacts based on their own observations and firsthand experiences on the land. These are summarized below. Though it was beyond the scope of this study to investigate these observations further, a number of them represent knowledge gaps and priorities for future research.

5.2.1. Changes in the atmosphere and sky

- "Prior to the 1970s, late at night the sky used to turn red – it was different. Since then, there have been a lot changes – with the moon, stars, sun. Morning stars... growing up, you'd see them every morning. Nowadays you don't see that. The coloration of the sky in the evening... the Dene weather report is to look at the sky.

But a lot of things are now changing. Clouds have started to hang around more, and I've noticed more rain." – Elder Maurice Mendo

- "Regarding the atmosphere... bad stuff is getting carried through the air, settling on our lands and getting into our animals." – Elder Frank Pierrot

5.2.2. Effects of permafrost degradation

- "Prior to 1976, the spring melt used to sit on the ground for a while. Since then, it sits there only a short time then it's gone, it just disappears quickly." – Elder Maurice Mendo
- "It feels like the permafrost is melting away. Once all the permafrost melts, there will be more water, and more land might be under water. As it melts, the highways will break down. With the Inuvik airport too, you see this is causing some problems." – Elder Frank Pierrot
- "The permafrost has changed... it has melted. Used to be closer to the surface. But now the topsoil is very dry – the high ground forest is very dry now. Permafrost is deep down now, not near the surface like it used to be." – Elder Thomas Manual

5.2.3. Changes out on the land, including ice conditions, and landslides and slumping along rivers in the Sahtú

- "For me, the ice seems like it broke up sooner than in the past. The elders always talk about how this is a smaller river [Willow River], but it goes at the same time as the Mackenzie does. That's how we would know when we lived here [at Willow Lake], that this ice goes, and then the Mackenzie would go, and we would know it's breaking it. The other thing is, this is way earlier than I remember... we are used to the ice breaking up around May 18-19, somewhere in that timeframe. But now it seems a little bit earlier, so I'm wondering. Maybe it's because the ice is thinner?" – Elder Joe Bernarde
- "Global warming – I see this a lot around Good Hope. There's a lot of landslides down the river – from Good Hope down to the Little Chicago area. I also noticed the sand – previously, we would drive our boats and know where to go. Year to year, summer to summer. But now, there is a change. One summer there is a sandbar in front of you, the next summer it's gone. The whole sandbar shifted around there summer to summer. It's very strange." – Elder Thomas Manual
- "About the landslides... I go travelling along with Mackenzie with some of my colleagues, I see a lot of hills that have been sliding into the river. The other part I saw was at Brackett River, Willow River, we go back out there, we travel on Brackett

River. At the place called, "where we camp overnight for rabbit," even beyond there we see a lot of landslides. It's starting to cave in a lot, the riverbank on Willow River. It's not a big river, but you can see it's starting to cave in all the way up towards Kelly Lake. I saw a lot of damage to the land and shoreline. One of the things that we've been wondering about in observing all these landslides is trying to understand why it's happening, I've been thinking about it a lot. In the past – past the Willow Lake camp, there's a lake there, we used to camp on the islands there. But now even that island, our campsite where we sleep, it's underwater. And another lake up higher – there too the islands are gone. So, there water is up there and I'm trying to figure out why that is happening. You see the change." – Elder Joe Bernarde

In an interview with elder Leon Andrew of Tulít'a, he described the changing water levels along Begáhde/Keele River:

- "In the Sahtú, the Dene people know the water high mark and low marks eh. Come summer it goes high and stays high, then in September you level off to normal again. And then fall time, in October, it goes down. And then during the winter, you are at a certain level and it stays like that, and springtime it smooths out again. Those are something that's been embedded in people's minds that you see every year, so nothing changes for you, let's put it that way. Just like clockwork, every year it's like that. But lately it's not like that anymore, you know the patterns are different. Like today, the Keele River, we know it's supposed to do that. But from summer high water, it's not going down that much, it's staying level like that until the end. So I don't know what happened here, but we did definitely notice the water change.

Also in mid-August, towards September, you normally get this heavy rain. We used to get a lot of rain in the mountains. And all that driftwood would come out of the Keele River and wash down this way, and people would enjoy logs for their firewood. That didn't happen for the first time in history that I know of. No logs, nothing, I don't know whatever happened there, that was strange too. I don't know whether it was due to it not raining enough in the hills, it didn't wash anything down the river. That was strange, first time I'd seen that in my life."

In terms of landslides, those present at the Tulít'a focus group in March stressed how important it is for people to know not to camp below a potential landslide area.

5.2.4. Travelling on the land affected and resulting health impacts

In one of the most direct mentions during the project, of the tangible health impacts of climate change that people in Tulít'a are experiencing, elder Theresa Etchinelle

explained the implications of having travel out on the land inhibited, by climate change or other factors:

- "We can't even go out – we've been waiting to go out. We can't go anywhere, even if we go to the camp – we can't go anywhere with skidoos, there's no snow. It's slowing down our way of life too, climate change – it's going to affect our emotional, physical and mental [health]. It's going to affect all areas of our life. More people are starting to get sick because that's what's happening now. It's affecting our health now. More and more people... they can't go out, so they get stressed out mentally. Especially the elders, they can't go out on the land like the used to. And it's affecting them."

5.2.5. Effects on wildlife

In his interview, elder Leon Andrew reflected on the 2013 fall hunt at Pietł'ánejo (Caribou Flats), including the late snows witnessed that year, and its effects on caribou. Elder Andrew and a number of other hunters had mentioned to Project Team member Reanna Campbell that there were fewer caribou at Pietł'ánejo than they had been hoping:

The season – when we're out there in September, you get snow. One inch all over. The wildlife, like moose and caribou, they feed on this, and then they go into their rutting season. If you recall last year, did you see any snow come down? There's two things happening I believe. Without the snow commanding [the caribou] to go into the rut, that didn't happen while we were out there. So, they have no reason to run around. The other part is it's warm in the valley, and they were up high, they had no reason to come down to the bottom because their nature call to go into the rutting season, that didn't happen. They didn't get the snow. The caribou is still up there on the side sunbathing. Who's going to repopulate the caribou nation there? So there's two factors I can see. It is a bit warm in the valley. Even the moose, they didn't get their call to go into rutting. So, that's been troubling me a lot. Only when we got home, we finally got snow in October. I guess it has something to do with climate change, the snow is not coming down when it's supposed to, and it will take our caribou and moose out of whack. Things have changed. The weather pattern, it's really changed. The snow, too.

Elder participants in the project also observed that fewer migratory birds have been evident in the Sahtú region in recent years:

- "It does show – when I was a kid, there were birds everywhere. The whole land was filled with song." – Elder Leon Andrew

- "Has something happened along the migration routes? My concern is with the bird populations – has to be monitored." – Elder Leon Modeste
- "I feel there is a difference from before, I see that the bird flocks, the geese flocks are not as plentiful as they used to be. I can really see the change there. The other thing is the small birds – you don't see any small birds, and that's very different. The other day I think saw five Robins land out here... but now again, there's nothing around. It's really strange, there is a big difference." – Elder Joe Bernarde

5.3. Concerns around resource development

Another topic of discussion centred on non-renewable resource development as a stark context within which environmental and social change can take place, with concerns expressed about the potential impacts of such development to the land and wildlife. As elders Alfred Taniton and Leon and Modeste observed:

- "You've seen how rapidly the infrastructure of the oil industry can accumulate and just happen like that, and it's there. I saw that, and it kind of bothers me a lot. We have for example, Giant Mine, Port Radium. The companies in question with those mines, they never clean up. They left garbage the way it is. We go after them, we ask them to clean up. They just don't want to pay attention to us. As of today, they continue doing that. And that's something where, whether we know how to read or write, we know that's happening. We know about it. The land in question that has potential for getting destroyed perhaps... we have only one land, it's a one-time thing. If we don't look after it, it's gone. So, we should think about that."
- "The wildlife should be preserved for the next 700 years and beyond – they have to be there for people in the future. The oil companies should think about that too – they have to find ways to preserve our wildlife. Will people moving here be willing to protect the wildlife the way we do? If the water is contaminated, how will we be happy; how will wildlife survive?" – Elder Leon Modeste

As well, some connections were made between the extraction and burning of fossil fuels, and the contribution this process can have to climatic changes through the production of greenhouse gas emissions.

- In terms of working together, the south, the government need to understand the importance of the rapid global warming change. The oil and gas exploration could be the cause of this fast rapid global change, warming." – Elder Leon Modeste
- "Mostly what we talked about today was the fracking and oil and gas. I think should tie it back together with climate change – I don't know – maybe some people might

be missing the connection of how this industry is contributing to climate change." – Carrie Campbell

Concerns were also raised to do with the agency and self-determination of communities in the Sahtú, in terms of receiving adequate compensation and benefits from development activities taking place on their traditional lands.

- "A good example is Norman Wells. It's Dene land. Dene found some oil seepage there, same as Port Radium. They found some material that indicated there might be some minerals there. During that time, they never considered the Dene people. "This is your land so be a part of our exploration," nothing like that, they just went ahead and ignored us. They took all – extracted all the materials, mineral, oil, gas, and they took all the money back to the city. They took all our money, and us today, we're still pitiful here. And the money's come right from our backyard." – Elder Alfred Taniton
- "I agree with Alfred about the money, so much money they took out from Norman Wells, but never anything for us. When I fly in a plane, you can see the seismic cutlines. Long, skinny little cutlines. I don't know why they cut it down with CATs and stuff like that, destroy so many trees for no reason. As a Dene, if we cut a tree, we know what we use it for. But, in exploration terms, how many trees they mow down – it doesn't matter to them. Those kind of cutlines should be done by people with a power saw and so forth. They should hire a crew, then cut those lines further. Then it makes sense because it's been done that way in the past, too." – Elder Thomas Manual

5.4. Identified concerns and vulnerabilities

In summary, taking those outlined above together with others mentioned over the course of the project, participants raised the following concerns relating to climate and other environmental changes in Tulít'a and the Sahtú, which act as starting points in the identification of key vulnerabilities that affect human health in the region:

- Changing temperatures and weather patterns in the region, different to what had been experienced historically.
- Atmospheric contaminant distribution and bioaccumulation.
- Permafrost degradation.
- Landslides and river slumping.
- Effects on water, including changing water levels.
- Resource development and extraction processes such as drilling for oil: including potential impacts to the land, water and wildlife, as well as issues of community agency, self-determination, compensation and benefits.

- Increasing difficulty in accessing and travelling out on the land, with subsequent mental health effects.
- Changing behaviour patterns (migration and other) of wildlife, including caribou, moose, wolverines, and migratory birds.

5.5. Addressing vulnerability and dealing with change

As mentioned, a major theme that participants frequently identified as both a source of community vulnerability and potential resilience was Dene language, identity, traditional knowledge, stories and way of life, including the land base from which many of these things stem:

- "Our language and our way of life were taken away from us. We are weaker now."
– Elder Alfred Taniton
- "We are Dene, we should be proud to speak our language – if we don't speak our language, how can we be strong? If it's our way, we can teach our kids to hang on to our language, we can teach them to be strong. If there's no Dene language in 50 years, I don't know if we'll be a strong force or not. Language is one of the strongest things that someone can own. If we don't share our language and stories, we will never be strong as a nation." – Elder Maurice Mendo
- "Having our camp sites, place names... that's important. As long as we're Dene in the Sahtú, you know, forever the government will recognize us. But as soon as we have no identity, then the government will probably not recognize us. What I'm trying to say is you've got to keep your identity and being Dene, you've got to be proud of yourself. Tell people who you are." – Elder Leon Andrew
- "In the past when we were growing up, we took advice from elders all the time. They were like our lifeline. We listened to them and managed to find a way to have a longer life. Elder voices and language is just like the Creator's language – there's a truth to it that prepares you for the future. Whoever listens to the elders will have a good mind and soul and will think their way through." – Elder Marie Kochon
- "On this land, we have plenty of wildlife. We don't spend very much money, but we go hunt. We get something to eat. We have enough for a long time to survive on. And think it of in that sense, too. It doesn't – we're rich – our country's rich in wildlife. We have plenty to eat and lots of fish. We want to protect it. That's an issue to think about." – Elder Alfred Taniton

In a youth breakout session at the November *Climate Change and Community Health Workshop*, participants echoed many of their elders' concerns and sentiments. Youth recognized the wealth of traditional knowledge possessed by their elders, and expressed their concerns about language and culture loss, including the breakdown in intergenerational knowledge transmission:

- "One thing about this [work] is for us to be connected as a community, to our land. We are blessed with our culture and as Dene people, we've been blessed for thousands and thousands of years because we live from Mother Earth. And people don't understand certain things like we do. And before science and before anything came in, these elders knew things before we even knew, right?
And that's what we have to understand is we're going to lose things, right? We're going to lose stuff that we can't show our kids, the magical of being--the magical feeling of being out in the land and learning how to survive and to adapt and to live off our land, right?" – Archie Erigaktuk
- "You guys told us the stories. The elders really made connections to some of the presentations we heard. The elders' stories...they make a lot of sense when it comes to what scientists and researchers are saying, where it takes them years and years of research to come to the conclusions that the elders already know." – Carrie Campbell
- "We can't even talk to our elders... Just in three generations – our grandparents, our parents and now us – we lost our language. None of us can even understand our grandparents." – Carrie Campbell

The youth participants were committed to addressing the various challenges facing their communities. In order to tackle these challenges, the youth recognized the need to work together with each other and with their elders. In bringing elders and youth together for the project, youth gained a heightened awareness of the level of support elders were willing to provide them.

- "We have to find a different of doing things that's healthier for us, healthier for our earth, healthier for our air. That's something we have to do. That's why we're here. We're starting from our region, the Sahtú region... starting from a small thing, our local area, right? And then once we start from somewhere...different places are going to realize, okay, well, these people are going back to maintaining and sustaining the land, sustaining our region, right?" – Archie Erigaktuk
- "I think we have a lot of support, too, from the elders. Like, you can't forget that they are some of the main people that helped stop the creation of the [Mackenzie Valley] pipeline. Those are the people that are talking to us right now. They're the ones who

fought hard for our culture and for our traditions and to keep the land the way it is. And also, they are our most important resources. We've got to continue these meetings and follow up with them because they're kind of like our last chance. They're our main – are a very important source of information for us. And at the same time, too, they have a lot of questions. And it should be us, the youth, that they turn to for answers. We should be the ones taking part in research and monitoring. We should be the ones implementing our own projects. We should be coming up with our own ideas and finding that information ourselves. We should be part of that process." – Carrie Campbell

- "A lot of the youth are feeling overwhelmed. We didn't realize how much support we were getting from the elders. So, we're really grateful to have that as well." – Carrie Campbell

Amongst elders, an appreciation of the level of engagement and concern exhibited by the youth participants for their futures and the future of their communities was gained:

- "I'm very happy about the young people participating here in our discussion. For a long time, I've been hoping and fighting for the youth to be involved. But, we seem to have left them out. Don't know how long we'll be around... [we have to] keep talking to the youth, make their minds strong so they can stand up for themselves." – Elder Marie Kochon
- "We had a very good discussion – the things we talked about and want to achieve... hopefully we can make that possible. In the past we had one trail to guide us how to live a good life. That was something we lived by, and was really good. Now, today is a little bit different. We do things, but sometimes we forget to remember the young ones – sometimes they get left on the side. Now they're here with us, hopefully that would make them stronger being here with us, and [we can] find ways for them to look for help. We can tell them about our way of life, and make them strong." – Elder Alfred Taniton
- "While we have the young people here, we should really give them something. They're going to be the next generation. I'm so proud of them being here. I'd like them to talk to us more." – Elder Thomas Manual
- "I really want to support you young people one hundred percent. I'm not going to live that long again. But, I'm worried about my young people, my kids, my grandkids. Use the elders. Maybe they can sit behind you. It's a way they can help you because we grew up out on the land. I'm still working out on the land. We support you guys. I'm happy you brought this up." – Elder David Etchinelle

Continuing on the theme of language, this was also identified as a key factor inhibiting communication between elders and youth. As elder Taniton observed, "we have our challenges, too, because they speak only English sometimes, and the elders don't speak English." Fora such as the *Climate Change and Community Health Workshop* are important and valuable opportunities to bridge the language divide, as Carrie Campbell acknowledged:

We're really grateful that by having a translator, we're breaking down that barrier because the language is really one of the things that separate us. And it's really nice to be able to communicate with our elders and hear what they have to say.

Tulít'a Dene Band Chief and Sahtú Dene Council Grand Chief Frank Andrew added:

Just listening to the youth that stood up today... I'm glad you guys are speaking up today. You talk about the barrier between the elders and the youth. I'm glad you brought that up so that the elders know exactly why we're not getting through to one another.

On the topic of agency and self-determination for Sahtú communities, particularly in regards to resource development activity, participants felt strongly that the marginalization of youth and elders (in terms of inadequate information and consultation) was a source of community vulnerability. Both elders and youth called for greater education and consultation around resource development projects as a means of addressing this vulnerability:

- "In past years, the oil companies, they would just consult or write a letter to three or four people. And that's where they get their okay. I can see where you're coming from, I agree with your wishes that other people should get consulted, like you're saying." – Elder Leon Modeste
- "What I think is, us in this room, young people and the elders, we were kind of left out. We were left out of the decision-making process. We weren't consulted. what I would like to see is for our leaders to put a stop to this and come back and consult the people, consult all the people they missed, they left out, like elders and young people, because us young people here, in not too long, we're going to be the leaders. We're going to be the ones making the decisions. It's not going to be them anymore. And if choices they're making are going to end up leaving a big mess, it's going to be us who are cleaning it up. And our children are going to as well." – Carrie Campbell
- "Every time oil companies come in, we want to be consulted right away. If an application comes in that they want to do a seismic testing, or if they want to come to drill on our land, do another couple wells with hydraulic fracturing, we've got to be notified right away. Then we notify the elders and vote on it. Then it becomes a

public concern, becomes comes a community concern to everybody. Then that's where everybody's getting consulted." – Gerald Pierrot

- "Something I'd like to see hopefully come out of the Sahtú region would be a legal petition for us to put a moratorium on fracking, until the majority of the Sahtú is educated and so we can make a decision, a proper educated decision. We think development is going way too fast. We were considering starting up a legal petition, not to completely stop all development for the rest of our days, but just to put a moratorium on this fracking so we can learn more about it, educate everyone, and then be able to make an educated decision." – Kathleen T'Seleie
- "I'm glad you are taking the initiative to do something about that, putting a moratorium on the fracking because we don't know enough. And we were never consulted. Our leaders went ahead and made decisions without, like you said, the youth and the elders. Nobody knows. I think what you're doing is really worthwhile, at least to get our people educated so they can make a sound decision." – Elder Theresa Etchinelle
- "I agree – what's the big rush? If our country or the world is to continue for the next 800 years, what's the big rush? They should take the time to help us understand what's fracking all about and what the exploration's all about, where it's leading." – Elder Leon Modeste

Finally, in direct reference to health, a few points were made about the need for improved access to health resources in response to the impacts of climate change:

- "Last week, Chief Frank and I, we went to a health and fracking meeting in Simpson. I'm glad you brought up fracking and health because one of the questions that was put to us was how we can improve the health in the communities. And we stated that we need to see more doctors. Each region should have its own doctor. That's the type of suggestion, I think, we've made to improve health services." – Elder Frank T'Seleie
- "When the doctor [Courtney Howard] presented about health... and also Frank said they went to Fort Simpson to discuss fracking and health – the biggest concern was health. Listening to the doctor, because of climate change, they're saying they're spending millions, maybe billions a year on health impacts. So I'm wondering if they're going to give more resources, more people to work to try to make a difference, because the health impacts are going to be higher, right? So, that was one of the concerns I had with the health department, because it's a lot of educating. It's just like when you hear the elders are giving that information to the youth, but it's up to them to decide what they're going to do with it, right? They're gonna go with

it, or they're not gonna go with it. So, it's just like health, you have to educate them."
– Rena Chapple, Community Health Representative in Tulít'a

6. Conclusion

This project represents the first exploration of climate change impacts and adaptation options in the community of Tulít'a, and one of the few that has taken place in Sahtú and indeed Subarctic Dene and Métis communities generally. What emerged through the discussions was that despite the involvement of a climate scientist in the project, participants did not wish to examine the Western scientific understandings of climate change in great detail. Rather, climate change was frequently situated within a broader discussion of ecological, social and cultural changes being experienced in Tulít'a and the Sahtú – including the resource exploration activity taking place in the region. One possible reason for this could be that whereas it can be difficult to deal with abstractions such as global climate change scenarios, shale oil exploration is an immediate experience for residents of the Sahtú. The concreteness of the implications of shale oil development activities is, perhaps, a mechanism for examining how participants understand and conceptualize environmental changes, more broadly. As noted in Section 2, Cameron (2012) has argued that more conventional "vulnerability and adaptation" approaches to exploring the human dimensions of climate change in the North have been remiss in leaving out discussions of interrelated regional resource development.

In electing not to adopt a more conventional approach to the research, the imposition of unfamiliar concepts and categories was perhaps reduced, and the existing mental frames of participants were instead drawn upon. This has meant that, while explicit references by participants to 'climate change', 'health', and 'adaptation' are less prominent in our results, through the interpretive work undertaken, an arguably richer and more organic understanding of these issues has been established, via the perspectives of the participants.

This report has but partially represented of one of the major achievements and contributions of this project: fertile dialogue between the generations; specifically, a facilitation of the transmission of Traditional and other forms of knowledge not only from elders to youth, but from youth to elders also. On-the-land and language and cultural revitalization programming have been strongly identified as means of protecting the health of Tulít'a and other Sahtú communities from the impacts of

climate and environmental change. As well, further efforts to support the agency and self-determination of Sahtú communities, including greater information and consultation on resource development projects, and improved access to healthcare, is warranted.

Expanding upon further specific adaptation strategies and actions that Sahtú communities can implement is the focus of the related 2014-15 *Climate Change and Health Adaptation Program for Northern First Nations and Inuit Communities* project in the Sahtú, *'Establishing a Sahtú Youth Network for a Regional Action Plan on the Health Impacts of Climate Change.'* Following up on the findings and recommendations of this project, the 2014-15 project will seek to formally establish a Sahtú Youth Network that supports coordinated research into key "environmental determinants of health," and responsive adaptation strategies in the Sahtú, including through on-the-land activities that actively strengthen the ties between youth and elders and harvesters. Through these ongoing efforts to help foster relationships of mutual support between elders, youth and other community members in the Sahtú – rooted in strong relationships with the land – it is hoped that a solid foundation for more comprehensive climate change and health adaptation planning will be established.

7. References

Andrews, Thomas D. 1990. *Yamoria's Arrows: Stories, Place Names and the Land in Dene Oral Tradition*. Manuscript on file at National Historic Parks and Sites, Northern Initiatives, Parks Canada, Yellowknife, NWT.

Basso, Keith H. 1972. "Ice and Travel among the Fort Norman Slave: Folk Taxonomies and Cultural Rules." *Language in Society* 1 (01): 31–49.
doi:10.1017/S0047404500006539.

Basso, Keith. 1984. "Stalking With Stories: Names, Places, and Moral Narratives Among the Western Apache." In *Text, Play, and Story: The Construction and Reconstruction of Self and Society*, edited by Edward M. Bruner, 19–55. Prospect Heights, Ill: Waveland Press.

Bélanger, Diane, and Jacinthe Séguin, eds. 2008. *Human Health in a Changing Climate: A Canadian Assessment of Vulnerabilities and Adaptive Capacity*. Ottawa: Health Canada.

http://GW2JH3XR2C.search.serialssolutions.com/?sid=sersol&SS_jc=TC0000381528&title=Human%20health%20in%20a%20changing%20climate%20%3A%20a%20Canadian%20assessment%20of%20vulnerabilities%20and%20adaptive%20capacity.

Berkes, Fikret, and Dyanna Jolly. 2001. "Adapting to Climate Change: Social-Ecological Resilience in a Canadian Western Arctic Community." *Conservation Ecology* 5 (2): 18.

Bravo, Michael T. 2009. "Voices from the Sea Ice: The Reception of Climate Impact Narratives." *Journal of Historical Geography, Feature: Narratives of Climate Change*, 35 (2): 256–78. doi:10.1016/j.jhg.2008.09.007.\

Caine, Ken J., M. J. Salomons, and Deborah Simmons. 2007. "Partnerships for Social Change in the Canadian North: Revisiting the Insider–Outsider Dialectic." *Development and Change* 38 (3): 447–71. Christensen, Julia. 2013. "'Our Home, Our Way of Life': Spiritual Homelessness and the Sociocultural Dimensions of Indigenous Homelessness in the Northwest Territories (NWT), Canada." *Social & Cultural Geography* 14 (7): 804–28.

Cameron, Emilie S. 2012. "Securing Indigenous Politics: A Critique of the Vulnerability and Adaptation Approach to the Human Dimensions of Climate Change in the Canadian Arctic." *Global Environmental Change* 22 (1): 103–14.
doi:10.1016/j.gloenvcha.2011.11.004.

Chan, Hing Man, Karen Fediuk, Sue Hamilton, Laura Rostas, Amy Caughey, Harriet Kuhnlein, Grace Egeland, and Eric Loring. 2006. "Food Security in Nunavut, Canada: Barriers and Recommendations." *International Journal of Circumpolar Health* 65 (5). doi:10.3402/ijch.v65i5.18132.

Chapin III, F. Stuart, Matthew Berman, Terry V. Callaghan, Peter Convey, Anne-Sophie Crépin, Kjell Danell, Hugh Ducklow, et al. 2005. "Polar Systems." In *Ecosystems and Human Well-Being: Current State and Trends: Findings of the Condition and Trends Working Group*, edited by Rashid Hassan, Robert Scholes, and Neville Ash, 717–43. The Millenium Ecosystem Assessment Series, v.1. Washington, DC: Island Press.

Cruikshank, Julie. 1998. *The Social Life of Stories: Narrative and Knowledge in the Yukon Territory*. Lincoln: University of Nebraska Press.

Downing, Ashleigh, and Alain Cuerrier. 2011. "A Synthesis of the Impacts of Climate Change on the First Nations and Inuit of Canada." *Indian Journal of traditional knowledge* 10 (1): 57–70.

Ford, James D., Barry Smit, and Johanna Wandel. 2006. "Vulnerability to Climate Change in the Arctic: A Case Study from Arctic Bay, Canada." *Global Environmental Change* 16 (2): 145–60. doi:10.1016/j.gloenvcha.2005.11.007.

Ford, James D., Barry Smit, Johanna Wandel, and John MacDonald. 2006. "Vulnerability to Climate Change in Igloodik, Nunavut: What We Can Learn from the Past and Present." *Polar Record* 42 (02): 127–38. doi:10.1017/S0032247406005122.

Furgal, Christopher, and Jacinthe Seguin. 2006. "Climate Change, Health, and Vulnerability in Canadian Northern Aboriginal Communities." *Environmental Health Perspectives* 114 (12): 1964–70. doi:10.1289/ehp.8433.

Furgal, Christopher, and Terry D. Prowse. 2008. "Northern Canada." In *From Impacts to Adaptation: Canada in a Changing Climate 2007*, edited by Donald S. Lemmen, Fiona J. Warren, Jacinthe Lacroix, and Elizabeth Bush, 57–118. Ottawa: Natural Resources Canada.

Furgal, Christopher, Mark Buell, Laurie Chan, Victoria Edge, Daniel Martin, and Nicholas Ogden. 2008. "Health Impacts of Climate Change in Canada's North." In *Human Health in a Changing Climate: A Canadian Assessment of Vulnerabilities and Adaptive Capacity*, edited by Jacinthe Séguin, 306–66. Ottawa: Health Canada.

Glaser Barney G. 1992. *Basics of Grounded Theory Analysis. Emergence vs Forcing*. Mill Valley, California: Sociology Press.

Government of the Northwest Territories - Department of Environment and Natural Resources. 2011. Our Changing Climate: Renewing the Northwest Territories Greenhouse Gas Strategy 2011-2015.

http://www.enr.gov.nt.ca/_live/documents/content/Our_Changing_Climate.pdf. Accessed January 19, 2013.

Hanks, Christopher C. 1996. Narrative and Landscape: Grizzly Bear Mountain and Scented Grass Hills as Repositories of Sahtu Dene Culture. Ottawa: Parks Canada, Historic Sites and Monuments Board of Canada Agenda Paper.

Johansson, Karin. 2008. "Inuit Safety Culture in and around Auyuittuq National Park, Nunavut." Master's Thesis, Winnipeg: University of Manitoba.

Legat, Aalice. 2012. Walking the Land, Feeding the Fire: Knowledge and Stewardship among the Tł̨ch̨ Dene. First Peoples : New Directions in Indigenous Studies. Tucson: University of Arizona Press.

Martin, Daniel, Diane Bélanger, Pierre Gosselin, Josée Brazeau, Chris Furgal, and Serge Déry. 2007. "Drinking Water and Potential Threats to Human Health in Nunavik: Adaptation Strategies under Climate Change Conditions." ARCTIC 60 (2). doi:10.14430/arctic244.

McGregor, Deborah, Walter Bayha, and Deborah Simmons. 2010. "'Our Responsibility to Keep the Land Alive': Voices Of Northern Indigenous Researchers." Pimatisiwin: A Journal of Aboriginal & Indigenous Community Health 8, no. 1).

Nadasdy, Paul. 1999. "The Politics of TEK : Power and the Integration of Knowledge." Arctic Anthropology 36 (1-2): 1-18.

Nichols, Theresa, Fikret Berkes, Dyanna Jolly, Norman B. Snow, and The Community of Sachs Harbour (N.W.T.). 2004. "Climate Change and Sea Ice: Local Observations from the Canadian Western Arctic." ARCTIC 57 (1). doi:10.14430/arctic484.

Northwest Territories Bureau of Statistics. 2013. Summary of NWT Community Statistics – 2013. <http://www.statsnwt.ca/community-data/Summary%20of%20NWT%20Statistics%202013.pdf>. Accessed January 14, 2014.

Pedersen, Henning Sloth. 2007. "Health in the Arctic and Climate Change." Polar Research 26 (2): 104-6. doi:10.1111/j.1751-8369.2007.00026.x.

Pielak, Clayton, Jackii Edwards, Kyra Sangris, and Taylor Pagotto (with Cindy Gilday and Susan Chatwood, Executive Producers). 2013. The Land of Our Future (video).

Toronto and Yellowknife: Walter and Duncan Gordon Foundation and Institute for Circumpolar Health Research. <http://vimeo.com/58653078>.

Ridington, Robin. 1988. *Trail to Heaven: Knowledge and Narrative in a Northern Native Community*. 1st ed. Iowa City: University of Iowa Press.

Robinson, Michael P. 1996. "Shampoo archaeology: Towards a participatory action research approach in civil society." *The Canadian Journal of Native Studies* 16, no. 1: 125-138.

Ryan, Joan, and Michael Robinson. 1990. "Implementing participatory action research in the Canadian North: A case study of the Gwich'in language and cultural project." *Culture* 10, no. 2: 57-71.

Simmons, Deborah, and Délı̄ne Knowledge Project (Walter Bayha, Morris Neyelle, Edith Mackeinzoo, Doris Taneton). 2010 (June). *Gúlú Agot'i T'á Kə Gotsúhza Gha - Learning about Changes: Health Risk and Climate Change in Sahtúot'ı̄ne Stories: Envisioning Adaptations with elders and Youth in Délı̄ne, NWT*. Délı̄ne, NT: Délı̄ne First Nation.

Simmons, Deborah., Bayha, Walter., Fink, Ingeborg., Gordon, Sarah., Rice, Keren., and Taneton, Doris.. 2014 (forthcoming). "Gúlú Agot'i T'á Kə Gotsúhza Gha – Learning About Changes: Rethinking Indigenous Social Economy in Délı̄ne, NWT." In Chris Southcott, Editor, *Northern Communities Working Together: The Social Economy of Canada's North*. Toronto: University of Toronto Press.

Simmons, Deborah., Donald, Gillian., and McNeilly, Glenda. (compiled by SENES Consultants Ltd). 2012. *Traditional Knowledge Research Guidelines*. Fort McMurray: Cumulative Environmental Management Association.

Woo, Ming-Ko, Paul Modeste, Lawrence Martz, Joe Blondin, Bob Kotchtubajda, Dolphus Tutcho, John Gyakum, et al. 2009. "Science Meets traditional knowledge: Water and Climate in the Sahtu (Great Bear Lake) Region, Northwest Territories, Canada." *ARCTIC* 60 (1). doi:10.14430/arctic263.

World Health Organization. 2003. *Methods of Assessing Human Health Vulnerability and Public Health Adaptation to Climate Change*. Geneva: World Health Organization.