



Tracking Change...

Local and Traditional Knowledge in
Watershed Governance

Report of the 2017-2018
Community-Based Research Projects in
the Mackenzie River Basin

trackingchange

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Brenda Parlee,
Elaine Maloney,
Tracy Howlett, and
Amabel D'Souza (Editors)

Cover:
Peel River camp participant
(Photo credit: Tracey Proverbs, University of Victoria)

Inside:
Travelling in the Upper Kát'odeh, northern Alberta
(Photo credit: Peter Redvers, Kát'odeeche First Nation)

Back:
Wilmore Wilderness Area in the Athabasca Watershed
(Photo credit: Tracy Howlett, University of Alberta)

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Canada

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Kiyo Campbell , Fisheries Joint Management Committee fjmc-fisheries@jointsec.nt.ca	P.O. Box 2120, 107 Mackenzie Road, Inuvik, NT, X0E 0T0 Tel: (867) 777-2828, Fax: (867) 777-2828 www.fjmc.ca
Amy Amos , Gwich'in Renewable Resources Board aamos@grrb.nt.ca	P.O. Box 2240, 105 Veterans' Way, Inuvik, NT, X0E 0T0 Tel: (867) 777-6600, Fax: (867) 777-6601 www.grrb.nt.ca
Deb Simmons , Sahtú Renewable Resources Board director@srrb.nt.ca	ᑭᑭᑦᑲᑦ ᑭᑦᑲᑦ ᑭᑦᑲᑦ ᑭᑦᑲᑦ ᑭᑦᑲᑦ, P.O. Box 134, Tulit'a, NT, Tel: (867) 588-4040, Fax: (867) 588-3324 www.srrb.nt.ca
Jody Pellisey , Wek'èezhìi Renewable Resources Board jpellissey@wrrb.ca	102A 4504-49 Ave. Yellowknife, NT, X1A 1A7, Tel: (867) 873-5740, Fax: (867) 873-5743 www.wrrb.ca
Diane Giroux , Akaitcho Territory Government aarom.coordinator@akaitcho.ca	Box 1768, N'dilo, NT. X0E 2P3 Tel: (867) 873-9282, Fax: (867) 873-8738 www.akaitcho.info
Shonto Catholique , Łutsel K'e Dene First Nation, Wildlife Lands and Environment Department lkdfnlands@gmail.com	Box 28, Łutsel K'e , NT, X0E 1A0 Tel: (867) 370-7000, Fax: (867) 370-3010 www.łutselke.com www.landoftheancestors.ca
Michael Freer , Treaty 8 Tribal Association of British Columbia mfreer@treaty8.bc.ca	10233-100 th Avenue, Fort St John, BC, V1J 1Y8 Tel: (250) 785-0612 ext. 233 Fax: (250) 785-2021 www.treaty8.bc.ca
Melody Lepine , Mikisew Cree First Nation Government & Industry Relations melody.Lepine@mcfngir.ca	Suite A - 8219 Fraser Avenue Fort McMurray, AB, T9H 0A2 Tel: (780) 714-6500, Fax: (780) 715-4098 www.mikisewgir.com
Peter Redvers , Katl'odeeche First Nation, Lands, Resources and Negotiations landdirector@katlodeeche.com	Box 3060, Hay River Dene Reserve, NWT, X0E 1G4 Tel: (867) 874-6701 Fax: (867) 874-3229 () - www.katlodeeche.com/
Joe Tsannie , Prince Albert Grand Council – Vice Chief jtsanniejr@pagc.net	2nd Floor, 2300 10th Avenue West, P.O. Box 2350, Prince Albert, SK S6V 6Z1 Tel: (306) 953-7200- Fax: (306) 764-6272 www.pagc.sk.ca/
Kevin Ahkimmachie , Treaty 8 First Nations of Alberta kahkimmachie@treaty8.org	18178 102 Ave NW, Edmonton, AB T5S 1S7 Tel: (780) 444-9366, Fax: (780) 484-1465 www.treaty8.ca
Garrett Schmidt , Ya'thi Néné Land and Resources Office garrett.schmidt@yathinene.com	Box 310, Fond du Lac, SK S0J 0W0 Tel: (306) 477-1251 www.yathinene.ca
Corinne Porter , Dena Kayeh Institute denakayah@gmail.com	P.O. Box 9, Lower Post, BC VoC 1W0 www.kaskadenacouncil.com

*See Appendix 3 for a list of students affiliated with community-based projects.

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Overview

Tracking Change: Local and Traditional Knowledge in Watershed Governance is a six-year research program funded by the Social Sciences and Humanities Research Council, led by the University of Alberta, the Mackenzie River Basin Board, and the Government of the Northwest Territories in collaboration with many other valued Aboriginal organization partners and universities. The broad goal of the project is to create opportunities to collaboratively document and share local and traditional knowledge (LTK) about social-ecological change in the Mackenzie River Basin, Lower Mekong, and Lower Amazon basins and determine its' role in watershed governance. The project aims to address the following themes and priorities: ¹

Themes and Priorities for *Tracking Change*...

- ✓ historical and contemporary observations and perceptions of conditions and change in the health of the **aquatic environment** (e.g., water quality, quantity, flow, groundwater, permafrost conditions);
- ✓ historical and contemporary observations and perceptions of conditions and change in **fish species** (population, movements, diversity, invasive species) and other **aquatic species** (e.g., geese, beaver);
- ✓ sustainability of **fishing livelihoods** (e.g., harvesting levels and practices, diet, health, access issues, perceptions of change in the health of valued fish species);
- ✓ implications of change for **governance** (e.g., maintaining healthy relationships to the aquatic ecosystem, maintaining respectful and spiritual relationships, respecting treaty rights);

The second year of community-led research saw some new initiatives come online, and the continuation or expansion of several projects started in 2016. Once again, funding was determined through a request for proposals process and, in general, the 2017 projects were a continuation of those reported previously (see Appendix 1); however, this second year of funding focused more specifically on environmental monitoring, community health and youth engagement. The following report summarizes the community-led research projects and activities funded through Tracking Change for the 2017-2018 fiscal year (April 1, 2017, to March 31, 2018).

Through the 2017-2019 fiscal year, Tracking Change was able to fund thirteen community-led research projects. As was done in 2016-2017, the community leads were provided with a 'toolbox' of methods including interview guides, a final report template, information about consent and other supports to help link projects throughout the basin together. This summary report is based

¹ These priorities were recommended in a workshop with the NWT Water Stewardship Strategy Aboriginal Steering Committee and the Mackenzie River Basin Board Traditional Knowledge Steering Committee (Feb. 10, 2016). Additional input was solicited for the research priorities from Aboriginal organization partners and other members of the Project Team by email in October 2015.

on the final project reports prepared and shared by ten of thirteen approved project teams. These reports were produced by the following organizations:

- Inuvialuit Fisheries Joint Management Committee
- Gwich'in Renewable Resources Board / Gwich'in Tribal Council
- Sahtú Renewable Resources Board
- Katlodeche First Nation
- Wek'èezhìi Renewable Resources Board
- Łutsël K'e Dene First Nation
- Akaitcho Territory Government
- Prince Albert Grand Council
- Mikisew Cree First Nation
- Treaty 8 Tribal Association of British Columbia

Each of the community project reports is based on a set of guidelines produced by the Tracking Change Traditional Knowledge Steering Committee. They include a project overview, research about fishing practices, water and well-being and a summary of stewardship priorities and youth involvement. The project reports include quotes from Elders and project participants as well as additional questions or issues identified during each project.

In the following pages, each submitted report has been summarized with an outline of the project, a discussion of 'What was learned...' and information about how youth were involved. As of the writing of this document, the full reports have not been made available publicly and the complete research datasets reside with each lead community. Contact information for project leads is provided on page 5 if readers are interested in reaching out to the community research leads for more information.

Terminology used extensively in the Tracking Change project includes concepts such as *Community Based Monitoring*, *Local and Traditional Knowledge* and *Capacity*. These terms defined and discussed in the 2016 report, and others that may be relevant, are included in a glossary in Appendix 2 of this document.

New Insights

As in the previous year, many oral histories, narratives and observations were documented about local issues of concern and of priority to local communities. The key themes and issues highlighted in 2017 build upon the many findings outlined in our 2016 report. New insights and observations that were noted this year include:

General

The 2016 reports found that "In some communities where there is limited access to healthy water and fishing resources, there are concerns about the continuity of knowledge and skills beyond the current generation. For example, elders in northern British Columbia and northern Alberta have limited opportunities to teach their grandchildren about traditional fishing practices." This finding was supported through 2017; however, some Elders shared their general concerns about

the impact of ‘consumerism’ and increased technology on the decline in knowledge transfer. They noted that the loss of skills in youth is difficult to pinpoint and that people just “don’t want to go into the bush no more” (Willie Martel).

With a focus on youth engagement this year, various challenges were widely discussed. Elders noted the language barrier and limited land skills of youth but were very hopeful about how the young people would be able to carry on their traditions into the future. Project coordinators noted that finding the right structure for Elder/youth engagement was key and that it can be very challenging to find the right leadership and support for youth.

All projects seemed to agree that more monitoring, more engagement, and more on-the-land programming is needed across the basin to help identify issues, determine causes, and most importantly, develop adaptive solutions.

Unusual Observations and Patterns in Aquatic Ecosystems

The majority of observations related to aquatic ecosystems remained in line with those put forward in 2016; however, one group of Elders discussed these changes not in terms of being out of the ordinary, but of being predicted. Many Indigenous communities have knowledge of ancestors foreseeing or predicting some of the changes we are seeing today and this has been further evidenced through conversations with Tracking Change participants.

Concerns about Resource Development

In 2016, communities identified that “biodiversity, including fish valued for food security by First Nations communities in the southern part of the Basin, has been impacted over the last century by agriculture, forestry, and petroleum exploration and development. For example, Lake Trout were extirpated from Lesser Slave Lake in the 1930s.” In the 2017 reports, many communities spoke about changes in biodiversity but did not necessarily attribute these changes to development alone. For example, Łutsel ‘Ke Dene First Nation talked about changes in the movement of muskox over time and the Fisheries Joint Management Committee interviewees talked about declines in fish populations as a result of increases in beaver populations. What these observations add to the overall knowledge contributed by Tracking Change projects is confirmation that change is happening for a variety of reasons. These changes are not just in aquatic ecosystems and are not solely attributed to resource development.

In the Akaitcho Territory Government (ATG) workshops, Elders discussed how Indigenous peoples have been adapting to change for a very long time, even before the clear impacts of climate change and development. What became clear through this year’s group of projects is that change is always happening and while the pace of change, and the required adaptive response, is hastening, the need to make adjustments remains and Indigenous People across Canada’s north have been making these adjustments for many generations.

The full list of findings from the 2016 report is included as Appendix 1.

Inuvialuit Knowledge and Use of Fisheries in the Mackenzie Delta



Krystin Hynes², Fisheries Joint Management Committee, the Inuvik Hunters and Trappers Committee, and the Aklavik Hunters and Trappers Committee

The Mackenzie River Delta is an important source of subsistence fisheries for the Inuvialuit that contributes to the overall sustainability of fishing livelihoods for the communities of Aklavik, Inuvik and Tuktoyaktuk. The 2017 program built on the results of interviews completed in 2016, through more focused discussions on changes to fish, fish habitat and fishing livelihoods. Discussions occurred on the land during fish camps coordinated by each community's Hunters and Trappers Committee (HTC).

Some areas of focus that were considered and ranked by priority with each HTC in advance of fish camps were:

- increased activity of beavers and their negative effects on certain fisheries in the Delta;
- changes to landscape and fish habitat associated with climate change;
- reduced condition of fish species in Delta, as observed by Inuvialuit fishers; and,
- food security as related to changes in fishing livelihoods.

FJMC staff discussed the potential for collaborative opportunities to address food security with staff at the Inuvialuit Regional Corporation (IRC); Inuvialuit representatives working on the IRC food security strategy were invited to participate in fish camps and facilitate discussions related to food security.

The fish camps for each community also provided learning opportunities for youth (local knowledge), opportunities to discuss the broad outcomes and feedback obtained through the TK interviews, and a forum for discussion on future directions and Inuvialuit priorities for research and monitoring (traditional and local knowledge, scientific) in the Mackenzie River Delta. Additional feedback focused on the condition of loche (burbot) harvested by Inuvialuit from Aklavik and Inuvik through a pilot harvest monitoring program led by FJMC in November 2017. Harvesters from Aklavik and Inuvik noted their concerns regarding the increased prevalence



² ² New contact for FJMC is Kiyoo Campbell

of spotted livers and discoloured eggs from loche harvested in the Delta; this was also documented in some of the 2016 interviews.

All of the TK collected is documented and maintained at Inuvialuit organizations, and outcomes are contributing to the local co-management of fisheries in the Inuvialuit Settlement Region. The knowledge collected will also contribute to the broader Tracking Change project.

What we learned...

A number of environmental changes in the Mackenzie River Delta are largely attributed to climate change, including an increase in the number of beaver dams, increased turbidity in Mackenzie River waters, erosion, the drying up of creeks and lower water levels, warmer water temperatures, and reduced ice thickness in certain areas.

Fish is a reliable food source that the community depends on daily. The main fish harvested are lake whitefish (crookedback), broad whitefish, coney (inconnu), herring, Dolly Varden char, and burbot (loche).

Research Questions for 2017 included:

- 1) How have fishing practices changed over time?
- 2) How would you feel if something prevented you from participating in fishing activities? What would this mean for you, your family, and your community?
- 3) What are you most concerned about when thinking about fisheries and the changing ecological landscape?
- 4) What do you see as the biggest obstacles to ensuring the continuation of traditional fishing practices?
- 5) How can these obstacles be prevented from occurring or overcome if they are already present? Who can help?
- 6) Do you see any positive aspects associated with the changing landscape, and if so, what are they?; Do you fish in the ISR? If so, how many times per week/month?
- 7) Can you show us on a map where you fish?
- 8) Did you grow up fishing?
- 9) How old were you when you learned how?

In addition to these, a series of questions followed concerning parasites and the quality of the catch.

Fishing and being on the land are most commonly related to well-being in the communities of the ISR. Fishing is a vital aspect of Inuvialuit culture, identity, and sustenance. The river systems provide a rich source of nutrition and supply what many people need to live off the land. Fish is a dependable food source for which there is no accessible alternative. When asked in the written questionnaire how participants would feel if something prevented them from participating in fishing activities, some answered that they... “[would be] devastated.. we need fish in our diet,” “sad, we rely on our fish as a food source,” “angered, [...] not being able to get these foods would

be a sad outcome if it could have been prevented,” or “[I’d] feel deprived from our traditional foods.” When asked what this would mean for their community, some answered that “it would be a shock, we rely on fish as a food source,” “less traditional foods for everyone,” and “[we would have to] spend more money on store food, lose our cultural lifestyle.”

Many participants commented on changes in water, including overall lower water levels, off-season high waters due to unexpected precipitation, and more sandbars. Sandbars are typically related to lower water levels and increased erosion, due to permafrost thaw. The low water levels appear to affect access to certain areas, but more often they produce safety concerns as boating in these locations becomes hazardous. Water levels that become high unexpectedly affect fishing practices, as high water is correlated with high amounts of dirt and silt. The increased turbidity makes net-fishing challenging as debris is often caught in nets, making it difficult to catch fish and necessary to dedicate more time to net maintenance and cleaning.

Concerns were expressed regarding the quality and number of fish caught in the ISR due to changing temperatures, water levels, and unpredictable weather patterns.

As the waterways are inextricably linked to the well-being of the Inuvialuit peoples, changes in the waterways will undoubtedly affect the people of this region. The project results contribute to our understanding of Inuvialuit priorities related to fish and fish habitat in the Mackenzie River Delta, the northernmost extent of the Mackenzie River Basin. In this area, community members have concerns regarding potential developments occurring upstream in the Mackenzie River, as well as observed changes to fish (e.g., reduced condition—softer flesh, increased sores, discoloured loche livers) and fish habitat (e.g., erosion, landslides, beaver activity). A fish camp was organized with the HTC from Aklavik and Inuvik that provided the opportunity to discuss Inuvialuit priorities related to the Mackenzie River Basin, as well as knowledge transfer from elders and active harvesters to youth, and the documentation of traditional knowledge shared at fish camps. All feedback is being provided to the HTCs, the FJMC, and relevant Fisheries and Oceans staff to support ongoing co-management efforts in the region.

Youth Involvement...

Youth were hired as fish camp coordinators and participated in the interviews and group discussions, and actively contributed to the collection of information. The goals of engaging youth in the fish camps were to provide them with opportunities to spend time on the land and learn about traditional fishing practices and from elders and active fishers from their home communities and encourage knowledge transmission between generations. Youth were hired as fish camp coordinators so that they are in positions of leadership for the project. Youth were also involved in conducting interviews and group discussions. All activities provided them with skills and valuable leadership experience. The major accomplishments of the youth activities were knowledge transmission and relationship-building between generations, which helps to strengthen understanding of culture and history as well as increase their skills in traditional subsistence harvesting, which will be invaluable to them as future stewards of the land and teachers in their communities. The main challenges were providing sufficient leadership/support for the youth that were in the fish camp coordinator positions, as well as providing a balanced structure to fish camp activities.

Changes Affecting Fishing Livelihoods in the Gwich'in Settlement Area



Amy Amos and Sarah Lord,
Gwich'in Renewable Resources Board
Tas-Tsi Catholique³, Gwich'in Tribal Council
Tracey Proverbs, MA Student, University of Victoria, and
Trevor Lantz, University of Victoria

Ongoing environmental and socioeconomic changes in northern Canada are raising concerns about the health of local fish populations, water quality, and the future of fishing livelihoods in the Gwich'in Settlement Area (GSA). In 2016, the Gwich'in First Nation participated in a pilot year with the Tracking Change project, focused on changes to Gwich'in fishing livelihoods. In 2017-2018, four projects were undertaken:

- 1) Examining interactions between environmental change, access to fish/fishing, and well-being in Gwich'in communities;
- 2) Spatial analysis of potential overlap between cultural features and environmental disturbances;
- 3) Community-based broad whitefish monitoring; and,
- 4) Monitoring lake trout in Airport Lake.



In project one, 29 individuals were interviewed on the land or in the communities of Aklavik, Fort McPherson, Inuvik, Tsiigehtchic. Interviews were conducted both with people who do and do not fish and focused on interviewees' personal fishing history, access to fish, and environmental change. Interviews were transcribed, coded and analyzed in the context of a well-being framework from the Assembly of First Nations. As part of project two, four cultural heritage experts were interviewed about mapping cultural features in the GSA. These interviews helped inform the project's mapping initiative.

Project three entered its first year in 2017 with the majority of financial support provided by the Northwest Territories Cumulative Impacts Monitoring Program. Three fishers catching whitefish along the Peel River near Fort McPherson were trained in methods to measure and take samples from whitefish caught in their nets. The fishers were then employed to take measurements on 5-10 fish per day for two days per week, over 10 weeks. A total of 377 fish from the three fish camps

³ No longer with Gwich'in Tribal Council

were measured. Samples were processed to age the fish and determine their otolith microchemistry (in order to learn about whitefish migratory patterns).

The fourth project was supervised by GRRB staff but carried out by a Gwich'in student who took the Environment & Natural Resources Training Program (ENRTP) at Aurora College, Inuvik. The student completed the fieldwork in March 2018 and analyzed the data for his Technician Report in pursuit of his diploma.

What we learned...

Data from the studies indicate that fish provide a critical food source in all four communities. The main species harvested are lake whitefish (crookedback), broad whitefish, (whitefish), Coney Lake whitefish (crookedback), broad whitefish, whitefish, coney (inconnu), and loche (burbot). In addition to those four species, ten other fish were discussed in conversations and interviews: char (a very important harvest species in Aklavik but not in all communities), herring, jackfish, salmon, sucker, walleye/pickerel, Arctic grayling, lake trout, rainbow trout, and smelt. Some of these fish would be harvested if caught in nets, while others would have traditionally been used as dog feed, or today returned to the river or left for other animals (seagulls, ravens, eagles) to eat.

In project one, examining how access to fish affects well-being, interviews focused on personal fishing histories, access to fish, and environmental change, with the idea that well-being indicators from the Assembly of First Nations' Wholistic Policy and Planning Model would be elicited through these conversations. This analysis ultimately showed that, despite socioeconomic and environmental barriers that have made it harder to access fish, fish continues to make strong, diverse contributions to well-being in Gwich'in communities. Socioeconomic factors like sharing networks and adaptive practices that are often encompassed in ecological monitoring and land-based education facilitate access to fish that positively impacts well-being.

Observations of change varied and depended on the specific issue. Some changes were noticed as early as the 1960s, some have been noticed only since 2017, and others have developed over several years.

Changes in access to fish and fishing was one of the main themes. Many participants noted decreased or decreasing access and mentioned several barriers and facilitators to access. The top four barriers were concerns about fish health, changes to rivers, high cost, and cultural change. The top four facilitators included the knowledge or experience to fish, a place to fish, access through other people, and the equipment to fish.

Changes in fish health and concerns about future fish health were discussed by every participant. The top four observations were fewer numbers of fish, soft fish tissue, and both internal (e.g. spots on fish livers), and external (e.g. spots on fish skin) physical issues. Participants were generally happy with the current health and quality of fish, but there are concerns for the future (contaminants, travel).

Changes in fish numbers, species, spatial and temporal distribution were inconsistent. A few participants shared concerns about fish migrations or observed changes in migrations. Some discussed concerns about spawning, and some expressed concerns about predictability (which species will be running at what times).

Some discussions focused on intergenerational knowledge transfer. Many spoke of younger generations not having knowledge about the land. Some attributed this to parents and greater communities not teaching youth about fishing; others cited the role of residential schools. At the same time, some participants spoke about young people learning these skills and seeking them out.

Interview questions geared toward changes related to water included: did they notice any changes in areas of the river system where people can travel? What kinds of changes and when? Were there some areas of rivers that have changed a lot? Have these changes affected fish migration/food/spawning? Did they notice any changes in water levels? What changes? When did they occur (years/seasons)? Did they notice any changes in eddies that people fish in? If so, what and when?

Water levels were discussed in almost every interview. Most participants noted lower levels, though some reported levels as higher at the time due to lots of rain, and others noticed levels rising and falling more than in the past. The majority of participants also reported seeing more sandbars. Lower water levels are impacting access, requiring changes to travel routes, and increased potential for boating accidents. The changes have been observed over several years, starting from the 1980s to 2010. Three participants (from three different communities) also noticed more stumps in the rivers.

Concerns about water quality were also prevalent, especially about water quality in the future. Participants spoke about a red/orange dust-like substance that was running down the Peel River in 2017, the sewage facility by Navy Road in Inuvik, contaminants from industry and developments upstream (oil sands, dams, mining), beaver dams, goose/swan guano, muddier water, seismic lines affecting lake drainage, lead or zinc in rivers, and unknown water and airborne substances.

Increased erosion and other related events (cut banks falling in, trees and shrubs falling into rivers, increased landslides, muddier water, erosion of specific islands in rivers, and thaw slumps—referred to as sinkholes by two participants), are threatening different places on the land, such as cabins/camps, and fishing areas. Some participants attributed these types of observations to climate change, thawing permafrost, increased silt and sediment in rivers, and an increased number of sand bars. The timing of these changes ranged from the 1990s to very recently (2017).

Changes in water temperature were noted, with the majority of interviewees citing increased temperatures. Participants spoke of warmer water temperatures causing fish to go soft in the nets, how fish spoil quickly when water is warm, and how people are checking their nets more frequently because of this. Softer fish is much harder to work with to create dry fish.

One of the main issues for the communities is climate change and its effects in the future. Several participants attributed changes they are observing on the land (such as changes in air temperature, river ice, seasons, and permafrost) to global warming. Many spoke about the coldest air temperatures they have ever experienced, and how today's winter temperatures do not compare to those of the past. Several participants provided stark examples of changes in freeze-up and break-up dates. One participant spoke about how people used to ice fish in September, whereas now people have to wait until November. Another participant spoke about how there used to be ice on the lakes on June 20th, but now they can't even go out on lakes on May 20th.

The other main issues relate to anthropogenic disturbances or development projects on the landscape. Within the GSA, concerns were raised about roads, the ferries that are part of the Dempster Highway and their impacts on sedimentation, and historic seismic lines. Concerns outside the GSA (that could occur in the GSA in the future) include oil and gas development, mining, pipelines, and fish farms.

Interestingly, some participants shared how their elders had 'predicted' some of the changes that are occurring now, such as higher air temperatures, melting ice (permafrost), and changes to fish and caribou.

"I see it today. And I don't know how they know. Because my Dad was telling me, it's not only me, we're [a] pretty big family... he would talk to everybody, and he was talking about the ground. He said 'this ground right here has got ice underneath it.' And he said, 'in the end, the sun is going to be very hot. And the ice will start melting.'"

Mary Effie Snowshoe, in her home in Fort McPherson, NT, August 30, 2017

Youth Involvement...

Six youth were employed to attend fish camps and were involved in other learning activities, e.g. trained to use multimedia equipment (digital SLR cameras for videos and photos, and audio recorders). These skills were used to document camp activities and assist with interviews. Three youth who attended the Peel fish camps trip undertook multimedia training as well as participated in whitefish sampling; two were subsequently employed to continue sampling in the fall. One of the youths was engaged through fall 2017 and winter 2018 to assist with data input and post-processing of samples. Through these activities, youth were provided with the opportunity to be at fish camp with elders, sharing stories, knowledge, and experience between generations. They were also provided educational opportunities through the fieldwork experience.

The goals and objectives of research involving youth were to provide summer employment, to learn about fish and traditional fishing practices from Gwich'in land users, and to build skills (fish sampling, interviews, photography, and videography). The intent was also to pique youth interest in the fishing tradition, in environmental sciences, and Gwich'in land-based knowledge to support pursuing careers in resource management. The experience also provided opportunities for elders to familiarize youth with Gwich'in stewardship principles. At fish camps, graduate students, post-doctoral researchers, faculty members, and research assistants from universities shared their

expertise and experience related to fisheries science, resource management, and community-based work with youth participants.

Tuġit'a Got'Inę Traditional Knowledge: The Impact of Climate Change on Fishing Livelihoods



**Deborah Simmons, Leon Andrew
Sahtú Renewable Resources Board, and
Chelsea Martin, MA Student, University of Alberta**

Fishing is an important livelihood activity for many northern Indigenous communities, especially within the Sahtú. However, ongoing climate-related changes are raising newfound concerns about the future of fishing and fishing livelihoods. In 2016, DéġInę Got'Inę community members participated in a pilot year with the Tracking Change project which focused on possible environmental changes in and around the Great Bear Lake region. In 2017, research was organized around documenting change on the Mackenzie River from the perspective of Tuġit'a Got'Inę. Through hands-on activities, participants shared and interpreted traditional knowledge about the changing ecology of water and fishing livelihoods on the Mackenzie River. Semi-structured interviews were conducted in order to explore the climate change-related impacts on water, fish, fish health, and wellbeing.

The primary goal of this project was to get youth, elders and fishing experts out on the land together to discuss some of the issues/changes that Tulita is enduring and gather information about changes to the land and resources upon which the community depends. The group comprised four fishing experts, two elders and six youth in the camp, located specifically at Tu Gow Cho because of its cultural importance and spiritual significance to the community. The camp experience provided learning outcomes for the youth. The group was able to set two nets along the Mackenzie River, providing youth with the opportunity to learn how to set a net safely and properly in a river system, and how to clean the fish once it has been caught. In addition to setting net, youth were able to tag along on water trips where they were able to increase their knowledge on where to obtain fresh drinking water when out on the land. Since there were only a few days available to complete the trip, the camp undertook a group interview to discuss changes observed along the Mackenzie. Topics discussed included changes and themes relating to fish composition and distribution, water levels and turbidity, changes in snow and ice, and intensity of winds.

What we learned...

Fishing has always been a necessary livelihood activity for the community of Tulita. Given its ideal location on the Great Bear River and along the Mackenzie, fishing has been a source of both food and pride within the community. The main fish species harvested are herring, g (bluefish), and walleye.

Some of the discussions around fish focused on how fish populations and distribution are changing. Some fish are not as abundant as they once were, and fish are smaller, representing a significant change to elders and community members. New fish are also starting to come up the

river, such as Arctic char and salmon. Participants noted that water levels have been dropping over the last few years.

Climate change has resulted in changes to travel (winter roads take longer to form and break up earlier), and as a consequence, access to resources. Hunting and fishing patterns are changing because of this; land changes are affecting harvesting opportunities, including wildlife and plant resources such as berries.

Changes in fish and fishing practices reflect a lack of availability of some favoured species. Cisco, greyling, walleye, loche, and jackfish were not found; the question is whether they were late, or no longer available. Fish that were caught were showing signs of changes (smaller livers, softer fish, etc.), which the elders attributed to warmer temperatures.



Participants indicated they have been experiencing warmer summers and milder winters. While in the past they would experience many days of -40°C , they didn't in the last year; only perhaps with the wind chill. Participant Robert noted that "February is usually a cold month, but this year people were walking around in sweaters; the weather is warming up. In summer, really high temperatures were 25, but at this camp, the temperature has been about 27 and it is forecast to get warmer yet".

Changes were also reflected in the change of seasonal patterns, for example, later freeze-up (indicating that the water is warmer), and different freezing patterns (e.g., the ice used to form rapidly, and the ice was hard, solid; now it takes some time to freeze and it separates and comes apart easily). It also thaws and breaks up really quickly. They also reported less snow in the last ten years (which hampered the building of the winter road), and it came later (in the past, it would usually snow by October—they would travel from house to house at Halloween on skidoos, but in 2016 it didn't snow until November—the children were still in runners at Halloween).

Participants also noted more erosion over the last ten years, especially in the Mackenzie River. Where there is sand, there is more erosion; at the base of the Mackenzie Mountain Range, the banks have started to cave. Elders believe it is caused by permafrost melt on the north face of the mountain; one can see the fresh breaks here and there on the hills along the river. They say this has never happened before, so they know for sure that it is melting.

Wind patterns have also changed in the last ten or so years, with more frequent and fiercer winds. The wind seemingly 'comes out of nowhere'—north or south, and present dangerous situations. The winds have been increasing over the last ten years or so, and in 2016 were especially pronounced. This year (2017) has been calmer and it was a lot safer to travel on the river this summer.

The changing climate is reflected in changes in vegetation, wildlife, and other species. They talked about willows growing faster than usual, and do not have the soft mild buds that moose like to feed on. The willows tend to dry up with the warmer weather, and if they are too dry, the moose will go elsewhere. The faster-growing willows also make the bush too thick for people and animals to navigate on the land. Community members can only see this getting worse as temperatures warm. Moose and caribou like the cold weather.

Muskox have been seen in the area in the last few years, where they haven't been seen before.

Erosion is changing the habitat for the beaver. It used to be that in June they travelled the river, but now they go back to the lakes and ponds because of erosion and the caving-in of the river banks.

There are fewer rabbits as well. One participant was not certain if it was because there are more foxes, or if it was the result of changing habitat, but there are not as many rabbits to snare.

Participants also noted other changes such as fewer mosquitoes, and fewer birds, such as y and bluebirds, and robins. The robins that have been seen seem to have darker bellies. There are fewer frogs as well.

These changes have also been noted by communities further down the river (in Fort Simpson).

Youth Involvement...

In addition to participating in the activities of the camp and recording group discussions, youth were involved in learning activities such as setting and checking nets and finding good sources of drinking water.

The goals and objectives of the research activities involving youth were to talk about the changes that elders have seen in their lifetime and compare it to the changes the youth may have been seeing more recently.

Through these activities, the youth were able to gain some hands-on training with cleaning fish as well as how to set a net in a large rapid river.

The main challenge of achieving the goals and objectives of the camp was that the weather was quite extreme. One morning was very windy, to the point where the group almost abandoned camp to move into the trees to avoid the wind. The other extreme was the heat. One day it was 32°C when the group was out on the land and this made people very unmotivated. It did not deter research activities; however, it slowed things down somewhat.

Tracking Change in Upper Kátł'odeh: Traditional Knowledge Assessment



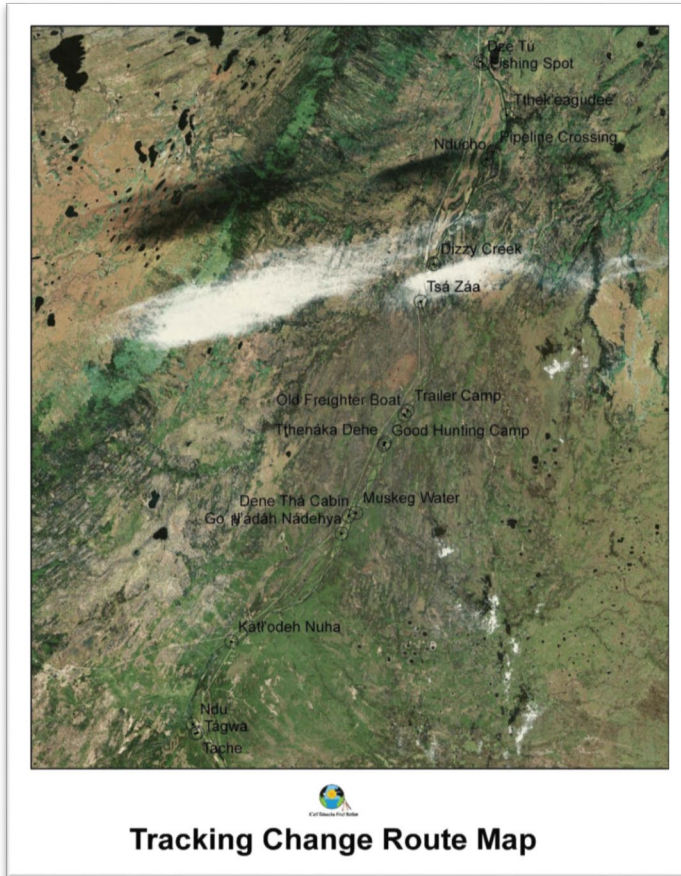
K'atl'odeeche First Nation

Peter Redvers, Kátł'odeeche First Nation, in collaboration with the Dene Tha' First Nation

This project involved facilitating a canoe trip along Kátł'odeh from northern Alberta (Dene Tha' First Nation primary territory) into the southern NWT (Kátł'odeeche First Nation primary territory) in order to document, using traditional perspectives, the differing changes and impacts in cultural landscapes from a highly impacted area (northern Alberta) to a relatively pristine area (southern NWT). The main type of information gathered included traditional place names; cultural sites and stories attached to the river; changes to the landscape and to cultural activities arising from logging, oil/gas development and other factors (such as forest fires and climate change); wildlife harvesting sites and areas; fish populations, migrations, and spawning; changes to water flow and quality; and visions for future land use and management. This project proposal was supported by the Dehcho First Nation as a regional Dehcho project. This information is being compiled for use by Kátł'odeeche First Nation (KFN) and Dene Tha' First Nation (DTFN) for land and resource management decisions. The information is being prepared into a report (to be jointly copyrighted by the DTFN and the KFN), that will be made available to the Tracking Change project under a user licence agreement.



The canoe trip took place from Sunday, August 20th through to the late evening of Friday, August 25th, 2017. Due to extremely low water levels for that time of year, resulting in a very slow river current and harder paddling, it took five days to get from Tache to Džę Tú ('Muskrat Lake', also known as Indian Cabins) so the trip ended at that point (see Tracking Change Route map). Furthermore, the ages of the paddlers were from 14 to 81, and the intent was to stop often to gather information, so we had overestimated our ability to reach the southern NWT within the planned timeframe. There was interest expressed among the participants to continue the journey into the NWT at a later date, but no plans have been made to date.



Tracking Change Route Map

Since completion of the trip, work has been carried out organizing the raw data; translating and transcribing all of the audio interviews that took place along the river; organizing and labelling photographs; verifying place names and other cultural information; and creating a map of the journey and sites visited.

What we learned...

Overall, the 'Tracking Change on Kát'odeh' project was a success, although it did not complete all of its objectives. A good cross-section of elders and youth from the KFN and DTFN communities participated in the trip and travelled the stretch of river between Tache and Dze Tú over a five-day period. However, the group did not manage to paddle into the southern Northwest Territories due to low water, slow current, and some inexperienced paddlers.

With the assistance of resource personnel, information and data were gathered relating to traditional use of the river, place names, cultural sites, fishing, water quality, wildlife, land management, and the importance of transferring traditional skills and knowledge to the youth.

The conclusions that emerged from the trip itself and the information gathered are best summarized as follows:

- The upper Kát'odeh was, and continues to be, a very important river for both the DTFN and KFN for a wide range of traditional activities, including ceremony, travel, harvesting, water use, and occupancy;
- Cultural sites along the river remain significant and the Dene Tha' in particular continue to visit and maintain these sites;
- There are ongoing concerns about the quality of the water in Kát'odeh as a result of development pressures, particularly related to upstream oil and gas development;
 - These concerns are amplified by the fact that the Dene people continue to use muskeg and spring water, which currently remain intact, as a reference for clean, taste-free water; therefore, maintaining the integrity of the muskeg and springs that are the source of this clean water is imperative;
- Fish appear to remain reasonably abundant in upper Kát'odeh, but low water has made it harder to harvest these fish using nets and other traditional methods;
- Wildlife remains relatively abundant along the river but there is increasing harvesting pressure, including poaching by Molą and noise pollution, with limited (if any) oversight of illegal or disruptive activities by Alberta Fish and Wildlife;

- The Dene Tha’ elders feel that they have lost considerable control over the management of their traditional lands and waters and that affects their ability to properly protect the land and carry out their traditional activities; this is a source of deep frustration;
 - Young people, given the opportunity to travel on the river and learn about its history and values, are appreciative of that opportunity and enjoy learning more about their own heritage; Travelling slowly (such as by paddling) as a relatively small group with an even mix of elders/harvesters and youth (and genders) provided a very good opportunity for one-on-one and small group mentoring; the youth picked up skills in cultural context and began to make their own connections to the land and water;
- Creating more of these sharing opportunities would be a good investment in youth for the future.

Youth Involvement...

Youth involvement and the interactions between youth and Elders was the central theme of this project. There was a good cross-section of elders and youth from the KFN and Dene Tha’ communities participating in the trip and travelling the stretch of river between Tache and Dzę Tú over the five-day period.

Although a couple of the youth had to end their trip early due to illness, the remaining youth remained fully engaged. The young travellers were briefly interviewed about their perceptions of the trip, as this was their first time on this entire stretch of river. Some of the most notable comments include the following:



Figure 1 Group photo of participants

“Sometimes when we went for a long time I was tired, but I still liked it... The beavers and stuff and then the tea dance place, that was awesome... I like visiting the graves and giving them tobacco...” - Brooklyn

“It’s nice, great stories too, meet new people, nice elders, they are cool, they are funny... I’m just enjoying the day...”- Bradley

“I had fun on this trip and I learned new things... I learned we have some family from everywhere...” - Tia

Guiding Respectful Behaviour While Experiencing the Aquatic Environment of Whatì: Implications of Change for Governance



Jody Pelligsey and Alice Legat
Wek'èezhii Renewable Resources Board

The impact of climate change on water levels has become a constant topic of conversation among elders and harvesters. It is important for the success of the fisheries to ensure that people follow the 'laws' associated with travelling on the lake and respecting the fish. Four elders, one principal investigator, at least one Tłıchq̓ university student, and several high school students who are participants in the Tłıchq̓ Government's Tłıchq̓ ɓmbè program, spent time with elders and community researchers participating in the 'Tq̓dzı and Wildfire' research camp. They documented information transferred through stories and learned how to monitor and manage human behaviour in conjunction with the changing water environment.

Whatì elders and harvesters spent time with youth and community researchers to share stories and other information about fish and fishing practices, how people use fish (food, medicine, etc.), what changes they have seen in fish and water, what it means to respect fish and water, what monitoring means to local people.

Youth were involved with interviewing elders and listening to elders' stories during activities on the land and in town. They worked directly with the community researcher and knowledge holders. The project supported connections between youth and elders. It increased awareness among youth of Tłıchq̓ ways of knowing—understanding what it means to show respect for fish, water, and other beings; why that is important.

Whatì elders and harvesters discussed some recent negative changes to the success of local fish populations: smaller sizes, unusual distribution, fewer numbers, different species, etc. As harvesters, they constantly monitor conditions and quickly become aware of change.



What we learned...

Today, as in the past, people in Whatì rely on fish as a daily important source of healthy food. Male and female fishers set nets at all times of the year and fish is a significant part of the daily diet. lake whitefish and lake trout are the main species harvested. Different species are more important resources at different times of the year. Fish species people harvest in Whatì include sucker, pickerel, northern pike or jackfish, lake whitefish, ciscoe, lake trout, loche, Arctic grayling, and inconnu or coney.

Tłchq have always relied on fish as an important food resource. Relying solely on caribou or moose was/is not possible, as these animals don't always come to be harvested. In the past fish was an essential food resource for dogs too. People needed dogs to get other food, such as todzi or moose, and to trap for furs. Without dogs, there was no money from trapping. Fish was also an important source of medicines. Women and men both set nets and check them. Women have a special role in how to respect fish, checking nets and preparing dry fish.

Knowledge holders stressed the importance of respecting fish; that respecting fish was necessary to ensure they would continue to be available. Elders discussed various Tłchq 'laws' that people follow to show respect for fish. Different people have slightly different ways of respecting fish. Respecting fish is part of respecting all beings.

Knowledge holders have observed many different changes, such as fewer numbers of fish, smaller sized fish, and fish moving to different locations. They speculate about possible causes of change. Local monitoring is an integral part of using and respecting fish.

Changes in fish and fishing practices

Participants reported fewer fish, smaller fish, and fish moving to different locations. A potential cause of the change was a major fire in 2014 that produced a lot of ash and smoke. Another potential cause, according to elders, is a lack of respect for the fish. They talked about how fish are not being respected the way that they should be. A common phrase they used when talking about respecting fish is "today everything is different."

Fishers also spoke of seeing fish they have never seen in the lake before.

Changes in water quality, flow, or water levels

Interviews were undertaken to learn about the health of the water in the region. Information about water is interconnected with information about fish; changes in fish are interconnected with changes in water; respect for fish is interconnected with respect for water (and all beings).

Ash from intense forest fires in 2014 affected water quality. These intense forest fires also affected the wind and the flow of water. As we can expect more intense forest fire events due to climate change, this will be an ongoing issue.

Lower water levels in lakes and rivers make it difficult for tqdzı to move between the mainland and islands. These changes also make it difficult for hunters to reach the shores where they traditionally hunt. Water holes that ungulates use are drying up.

During a recent review of possible impacts of building an all-season road to Whatì, the GNWT stated that forest fires “... may cause temporary stress to fish populations, ... the recent fires [2014] are unlikely to have a lasting effect on fish populations.” Evidence from the elders suggests otherwise (2016 Tracking Change project). As they discussed possible causes for negative changes to fish populations, they most frequently mention the impacts on water quality from the smoke and ash of the unusually intense forest fires of 2014. They also noted that the 2014 forest fires changed the wind direction and the surface water flow during the fire.

And with the impacts of climate change, we can only expect unusually intense fire events to happen more often. At the same time, there is some uncertainty about how these negative changes will evolve in the near and distant future, especially given the multiple factors that contribute to change—some known and some as yet unknown.

During the hearings, the WRRB made these recommendations: 1) monitor fish and water with a system that coincides with Tł̓ch̓q knowledge; 2) continue to build on the elders’ and harvesters’ knowledge; 3) Allow fish populations to recover—based on elders’ and harvesters’ knowledge—before introducing any new human activity that could add to the negative cumulative impacts on fish and fish habitat.

The community also recorded and shared many place names.

Research about Well-being

Today as in the past, people in Whatì rely on fish as an important source of healthy food. Store-bought options are very expensive and often less nutritious. It is well known that for a healthy diet it is essential to include country foods, such as fish. And with caribou less available, fish becomes an even more important food resource. Reduced access to fish contributes to food insecurity.

Fishing is an activity that keeps people connected with their land and culture—learning about respect for fish, water, and other beings from the Tł̓ch̓q perspective. The Tł̓ch̓q, like other Indigenous people, consider human behaviour as an indicator of the health of the land—including water, fish, and animals. It is essential to manage human behaviour/to respect fish and water (and all beings), to ensure that they thrive.

Priorities for care and stewardship

There is some uncertainty about how changes to fish and water will evolve in the near and distant future, especially given the multiple factors that contribute to change—some known and some yet unknown. Ongoing monitoring is essential.

Local monitoring (harvesters) is an integral part of using and respecting fish. Local monitoring provides essential information for co-management policies and practices that is not available in any other way. Local monitoring builds on elders’ and harvesters’ knowledge with a system that coincides with Tł̓ch̓q knowledge.

The benefits of local monitoring and the capacity to respond to its input are clearly demonstrated with the experience of the former commercial fish plant. In 1969-70, a man named Casey Jones built and opened a commercial fish plant in Whatì. Men set nets and fished with boats and motors, and women worked at the plant cleaning fish. At this time fish was very plentiful; people showed respect for fish.

Using their respect for fish and local monitoring, the elders decided to close the plant, to help ensure the fish thrived. This is an excellent example of adaptive management—a flexible action to manage human behaviour that responds to uncertainties defined through local monitoring.

Youth Involvement...

Youth were involved in research activities such as interviewing or mapping information. Knowledge holders and other community members want youth to understand the relationship between boreal caribou, water, and fish and how to respect each to ensure they thrive. For elders and harvesters, the success of the fisheries depends on people following the Tłıchq 'laws' associated with travelling on the land and respecting the fish and water.

The major accomplishments of youth activities were that connections were made between youth and elders. Youth were involved with interviewing elders and listening to elders' stories during activities on the land and in town. There was also an increase in awareness among youth of Tłıchq ways of knowing—understanding what it means to show respect for fish, water, and other beings, and why that is important. Youth worked directly with the community researcher and knowledge holders.

Tracking Change on the Great Slave Basin



Lauren King⁴, Joseph Catholique, and Edward Drybones
Łutsel K'e Dene First Nation; Wildlife, Lands and
Environment Committee

The Łutsel K'e Dene First Nation (LKDFN) along with Akaitcho partner Deninu Kue First Nation (DKFN) embarked on two canoe trips, providing traditional knowledge holders and youth opportunities to be out on the water, practice and transfer traditional skills and knowledge, implement fish and water indicators, collect TK and document methods, and develop thresholds to trigger stewardship responses. In particular, the study aimed to work with LKDFN representatives to document and understand how traditional land-based knowledge and narratives can contribute to Dene self-determination, land administration, and governance. The five guiding research questions include:

- 1) What TK and narratives are transmitted during the river travel and land camp experience?
- 2) What environmental, social, and cultural changes are observed and communicated?
- 3) How are stories used to transmit knowledge?
- 4) How does the travel experience contribute to the governance of ancestral waters and lands?
- 5) What impact does the land camp/travel experience have on LKDFN youth connections to land, traditional knowledge, and culture?



The LKDFN participates in the Akaitcho Aquatic Monitoring Program (AAMP), involving the Yellowknives Dene First Nation, Deninu Kue First Nation, and the Łutsel K'e Dene First Nation. Each community lives on a different part of Great Slave Lake and undertakes a summer water and fish monitoring program. The Łutsel K'e program, monitoring the east arm of Great Slave Lake, is called *Ni Hat'ni*. AAMP is mainly funded by the Department of Fisheries and Oceans Canada which requires the collection of scientific data, not Traditional Knowledge. This project provided the opportunity to study Traditional Knowledge to be documented and stored in the community's database.

Building on the capacities gained in earlier studies of a similar nature, the purpose of this work is to record and interpret Denesoline traditional knowledge (TK) and stories—the knowledge and narratives of land users, elders, and youth—transmitted during a multi-day travel experience, to

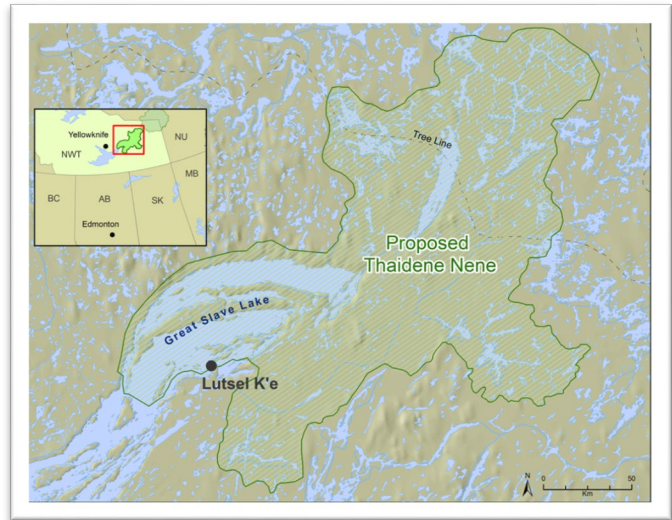
⁴ New contact for Łutsel K'e Dene First Nation is Shonto Catholique

understand how these can contribute to Dene self-determination, land and water governance, and cultural livelihoods.

What we learned...

Families in Łutsel K'e depend daily on locally harvested fish as a major source of food. The main species of fish harvested are lake trout, lake whitefish, grayling (bluefish), jackfish (northern pike). Stories shared by participants during interviews brought up stories of fishing frequently.

Prompts during interviews provided a platform for participants to expand on their ideas, topics, themes, or to elaborate and provide detail wherever possible and appropriate as it pertains to the TK and narratives transmitted during the travel experience, the cultural, environmental, and social changes observed; and, how the narratives could be used to transmit knowledge to the LKDFN community.



Consumerism is pulling Denesoline away from their culture. It has affected the way in which goods and gear are prepared in the community and changed the way people travel, which contributes to the loss of traditional skills. As youth begin to focus on education and making money, purchasing goods and technology have taken precedence over learning traditional skills. This loss of skills has occurred over time and is the result of youth having multiple incentives to practice other activities (i.e., school, technical, luxuries, etc.).

Climate change has been discussed in the recent literature related to the Northwest Territories and has been linked to pollution, fluctuations in water levels, and forest fires. The community is concerned about pollution caused by mining operations, especially the presence of mercury and arsenic in waterways where people fish. Concerns have also been expressed about land pollution, from industry but also about use by outsiders and the increase of trash in the bush. Seeing litter on trails and at areas associated with LKDFN made participants quite upset.

Many participants noted changes in water levels. The summer of 2017 was considered a 'high' water season, but the ongoing narrative indicates that water levels have been dropping. There are also changes to the landscape. There were shared stories of dried up canoe routes and water canals, the disappearance of small waterways and ponds. Canals used for travel were of particular importance.

Community members say it is warmer than it was just a year ago in places they frequent. Elders identify the change in climate, highlighting fluctuations in temperature and other dramatic changes year-in and year-out on the land. Changes are rapid, and other events, such as forest fires are occurring more frequently.

Fires have caused changes to the ancestral areas of the Denesoline—huge scars remain from the major fires in 2014, and on the way to Desnethche, evidence of recent fires could be seen in several areas. The land around Desnethche is very sacred. The Denesoline travel there for a plethora of reasons, one of the most common is to heal and pay respect to the Lady of the Falls. To see such drastic changes to the landscape is disheartening to the community.



Figure 2 Remains from the massive forest fire behind Desnethche. Burned landscape from here to the horizon.

Changes in wildlife behaviour was a consistent theme. Many related stories of chasing caribou off the runway so that planes could land. Many remember shooting caribou a mere few steps from their front porch. Caribou moving north has now become a common discussion. The movement of wildlife from ancestral locations to new areas is not limited to caribou. Muskox have been seen in dense brush, which is abnormal. Moose are moving to the barren lands.

Travelling the Land as Cross-Generational

Travelling the land is not only a cultural experience but a “spiritual journey.” For many youths, to travel the land was a way they could pay their respects to past Elders. Getting to see the land the Elders cherished is of major importance and instills pride to maintain LKDFN governance towards ancestral lands. For many, travelling the land is a way to reconnect with family and experience life from their perspective. Many youths discussed places their families had been, to note that it is a very important experience, seeing the places in the physical and not just through stories. Travelling the land and having the opportunity to partake in experiences like this allow youth to experience the lives of their ancestors. It helps them develop relationships with other members of the community and begin constructing relationships with the land. Youth in these communities are the future from which younger generations will learn. Having the opportunity to travel the land, generate stories, share knowledge, and re-visit ancestors through landscapes is something

these youths can carry forward into the future, to understand why this type of programming is important and, hopefully, begin to build capacities.

Many youths face a language barrier when talking to Elders, as they cannot speak their traditional language. Many express their frustration when they feel their discussions with Elders are circular and repetitive. These barriers, however, do not deter the youth and all participants stated that a major reason for participating in this travel experience was to re-connect with their culture.

Each participant had their own stories of their experiences with the land and highlighted the way in which the land influences them. The land represents an extension of themselves; the idea of 'feeling like myself' and 'me time' on the land was prevalent.

A narrative that increasingly emerged when sharing travel experiences and the ways in which stories are used to transmit knowledge, was 'the land as a learning space.' The land in these narratives is an avenue of knowledge and spirituality, and connection to culture rather than physical space that bestows knowledge. These discussions shed light on the ways in which youth not only learn traditional skills, but also life skills and, with that, self-reliance. Many youths participating on this trip had little to no experience in the bush, while others were incredibly adept at land skills. Experiences on the land represent a community resource to be shared and celebrated and a space for knowledge transference through nature-based avenues and the sharing of stories.

Having the honour to travel the land with an Elder really begins to illuminate the way in which travel is viewed. Travelling the land is a family ordeal, regardless of who is on the trip; when you travel you are family. This idea of 'family' is where the motivations to continue to partake in these trips arise. When discussing the opportunity and the importance to partake on this trip, many of the youths related this trip to a time they spent with their grandparents prior to their passing.

The LKDFN community expressed a direct need to continue to focus on TK and youth involvement. This study was built from existing capacities in land monitoring and the Dene way of life. As part of the study, there is an incentive to continue to build these capacities by getting youth on the land and involved.

Youth Involvement...

Youth were involved in other learning activities such as travelling the land with a local Elder and land user; learning about TK skills and Traditional stories associated with the travel experience and managing self-confidence and using their skills.

Some of the major accomplishments of the youth activity were: Youth feeling 'empowered,' having the experience to 'experience their culture,' learning TK skills from a respected Elder and land user, generating their own stories to share with future youth and the current community, and building a desire to get out on the land more often. Some of the challenges of achieving the goals and objectives of the study were: tight Timelines; youth lack of land skills (start a fire, paddle effectively, etc.), being an outsider.

Past Knowledge for Future Protection



Annie Boucher, Diane Giroux, and Mike Tollis
Akaiicho Territory Government

The Akaiicho Territory Government (ATG) guides the regional body of the Akaiicho Aquatic Monitoring Program (AAMP). AAMP was originally responsible for capacity development within the First Nations of Akaiicho. Its role has since evolved to move the priorities of the collective Chiefs forward in achieving lasting benefits for the communities. One major priority that has been at the forefront of discussions at all levels within the First Nations is the preservation of knowledge from the older generations, and the passing of this knowledge on to the youth.



The Akaiicho First Nations hosted an on-the-land workshop to build on the experiences and knowledge shared in the previous two workshops held on water issues. Building on the workshop in 2016, the aim was to better define the threats facing the aquatic ecosystem. The focus was on better defining threats as natural or unnatural, and determine whether they are manageable or mitigable, or if threat mitigation would require adaptation strategies. Through the sharing of traditional knowledge, the project's goal was to determine how to deal with the problems communities faced now and into the future.

On the subject of the future, the 2016 workshop in Akaiicho identified a serious component that must be included if we are to give the future the respect it requires, and that is the involvement of youth at all levels. In the planning of this workshop, a major focus was placed on the involvement of youth (who would make up approximately 50% of workshop participants), engaging them through boat experiences with Elders, sitting down with Chiefs, and having their input in the conversations be heard and discussed. The youth will not only be the ones to inherit water issues but having them see respect shown at all levels of interaction is key to the success of the First Nations.

What we learned...

In 2016, ATG held a workshop with Elders, youth, Chiefs, and technical staff of the First Nations focusing on water and fish in the Akaiicho region. Interviews were held after and a report was developed that shares some of the information observed in Akaiicho from close to 80 years back.

Again, at the end of that workshop, the Elders spoke loudly and clearly about the need to include more youth in the discussions moving forward.

In 2017, a workshop and land camp were held with Elders, youth, Chiefs, and technical staff of the Akaitcho communities in Łutsel K'e. The efforts in the workshop were focused on capacity-building with the youth, but capacity-building from a TK perspective. In this light, the workshop was started with a fire ceremony, led by JC Catholique, drummers, and the Elders.

Though we started the workshop in the hall, trying to focus on the indicators of change identified in 2016, the focus shifted as it was acknowledged that the youth were not being engaged enough within the workshop. Discussions were held and it was decided that there would be a drum dance and hand games over the course of the weekend. Also, we began talking about the gap between the Elders and the youth, and the best way to bridge that gap. It was acknowledged that the community hall is no place for the youth to learn, and all were looking forward to the land portion of the camp the following day.

Various Elders spoke with valuable advice, such as an Elder from Łutsel K'e who said that the Dene have always been people that have adapted to change, and there are changes being observed now, and we have to adapt just the same. This is where the perspectives of the past are brought forward to today, not the day-to-day tasks necessarily, but the overarching ideas like adaptability and work ethic. Another Elder recommended extended camps with youth on the land and the idea of changing the Elders who teach them week to week. There was talk of including TK in the school curriculum and comment that it is slowly getting incorporated, and that was positive.

There were a few more comments on indicators of change and interesting perspectives. One comment from a Smith's Landing land user was that the pressure ridges are coming up more and more and he believes these are attributed to the warmer water and changing currents. He also commented that the fish on the south side of the lake are getting worse, softer, slimy, unhealthy looking and that the polluters of the water should be held accountable.

There was concern expressed about the Site C dam, that the mining companies around the lake, old and new, are still impacting the water, and one interesting perspective that the water levels, viewed generally as dropping, are not actually dropping, but the earth is expanding and it may seem like there is less but there is not.

Changing weather was considered the culprit for the changing water temperature, and partially the water level, but man-made causes were generally to blame for low water (Bennett Dam, agricultural use of water...) and diminishing water quality (mining, Alberta industry...).

On the second day of the workshop, the youth were engaged and played a big role in sharing circles that happened at the Łutsel K'e Cultural Camp on the Snowdrift River. On the land, there were three wall tents, a teepee, and a kitchen area that were used for smaller break-out groups of Elders and youth for discussions. Each had a fire in them, tea was made for everyone, and dry meat was shared. The conversation varied from group to group, as Elders were asked to speak about what they wanted to speak about, and youth were asked to ask what they would like to

hear about. Conversations ranged from caribou, respect for animals, to life history, residential school and the role of youth in the future of Akaitcho. This technique of small groups made it easier for youth to be involved in discussions and more personal than a bigger gathering of people in the hall or office.

One group had Elders talk about their childhoods and then requested the same contributions from the youth. The Elders grew up differently in different communities but they learned the same skills, and these common grounds are where the teaching of youth in these regional contexts should focus.

One group spoke about the importance of language and the need for its revitalization with youth. They were taught that listening is one of the most important aspects youth need in dealing with Elders, and though it seems simple, it a skill that needs development. There was discussion about residential school and the effects that had, as well as how residential school impacted the transference of knowledge of the land.

There was some encouraging conversation in one group that the youth could relate to. An Elder spoke of their experience with residential school and though that kind of learning took him away from the bush, he was able to return to the bush with his father and learn the ways of living there. He was demonstrating the possibility of the youth these days to learn as much as they can in the western scientific way and still maintain the knowledge of the ancestors in the bush. He said that the youth could live entirely in the western way if they chose, but to know the land and the bush is to be able to feed your family.

The recommendations that came at the end of day two were mostly from Elders but a couple from the youth. Recommendations were put forward as follows:

- A youth council be developed for Akaitcho to facilitate youth recommendations to the Executive
- That land camps like this continue, but go a step further:
 - Go out for a longer period of time (recommendations were week- to month-long camps)
 - Let the youth do everything—make fire, make food, get water...
 - That language be a bigger part, not just with translation, but teaching the youth
 - Rotate the Elders at the camps so that youth learn different ways
 - Travelling to the location is part of the camp
 - Seasonal camps, spring, summer, fall, winter and what needs to be done in each season
- Make more books for youth to learn culture from ancestors
- Youth get more opportunities to travel to the Akaitcho communities for something of a cultural exchange within Akaitcho
- Focus on treaty rights, constitution rights, and indigenous rights
- The end of day two had a very well-attended hand games tournament with youth and adults from all communities.

On the final day of the workshop, the facilitators told the Elders and Chiefs who were around the table to take a seat on the benches at the back and allow the youth to come forward to the table and speak. The Elders and Chiefs wanted to hear from the youth as to what they learned, what they liked and what they wanted from future work. The youth sat around the table and though they were generally shy to speak in the microphone, each spoke. They spoke to some of the recommendations listed above. They liked hearing from the Elders and would be happy if there were more opportunities to go out on the land.

Finally, the Chiefs and some Elders spoke to close the workshop and some good words were spoken to the participants.

Recommendations, Direction, and Conclusions from the workshop are being drafted from the transcribed notes and will be shared when available.

Youth Involvement...

Youth were involved in this project through participation in the workshop, breakout groups with Elders and Chiefs, and discussion tables. They were also given a photo project and were invited to participate in hand games and a drum dance.

The primary goals were to provide the opportunity for youth to have conversations with Elders, ask questions, listen to stories, and share their own perspectives to educate the Elders as well. This enabled the youth to speak about their concerns and have Elders and Chiefs hear what the youth of today are concerned about.

One of the best parts of the meeting was on the final day when the Chiefs and Elders left the meeting tables and sat at the back of the room on the benches, while the youth came forward to talk about their experiences in the workshop and concerns going forward. Some were shy to speak, but others brought up recommendations, spoke to what they learned, and requested that they have more opportunities like these to go out on the land and talk with Elders from other communities to learn.

The youth were also given disposable cameras to take pictures of whatever they wanted throughout the workshop, and when the pictures were developed, it was interesting to note that some took very similar pictures of what they liked and what they wanted to remember.

Some youth were not interested in doing the photo project, and some were not always interested in the meeting. It was difficult at times to keep the youth involved and focused when many were out of their own communities for the weekend and wanted to do other things than sit in the hall. It wasn't difficult however to get youth to speak in the smaller group settings in the teepees and wall tents. This format worked much better than large discussion groups.

Denesuline Knowledge about Social-Ecological Change in the Mackenzie River and Athabasca Regions



Vice Chief Joe Tsannie, Allan Adam,
Rudy Adam, and Coreen Sayazie
Prince Albert Grand Council
(Prince Albert, Fond du Lac, and Black Lake, SK)

Denesuline Elders and Youth from Black Lake and Fond du Lac in northern Saskatchewan were engaged in a sub-research project in partnership with the University of Alberta and other community partners for the purposes of sharing local and traditional knowledge about social-ecological change in the MacKenzie River and Athabasca regions, and to determine roles in watershed governance.

The first venue for knowledge sharing occurred at a land-based spiritual gathering hosted by the Łutsel K'e Dene First Nations at Great Slave Lake from August 5th to 11th, 2017. The second venue was the Black Lake (Athabasca region) Elder gathering September 29th to October 2nd, 2017.

The purpose of the research project is to collaboratively share and document historical and contemporary observations and perceptions of conditions and changes in the health of the aquatic environment in northern lakes and river systems as per the research guidelines identified by the University of Alberta.

The participation of youth in the project is to ensure traditional Dene knowledge is passed on from the Denesuline Elders and community members.



What we learned...

Dene Elders have observed smaller fish in lakes and rivers as well as deformed fish and new species. It is felt by the Elders that the disruption of fish and animal habitats is a result of mining exploration. Drilling in the bottom of lakes is a practice that has been observed by Elders for several years.

In terms of water quality, Elders have noted that in some areas lakes are getting larger and in others, they are drying up. There is increased sediment in the water and some contamination toward the west side of Lake Athabasca. There is mining and uranium tailings seepage and water

fluctuations due to upstream hydro development projects in BC. These impacts are limiting access to traditional hunting and fishing areas and leading to perceptions of unhealthy drinking water.

The Elders were glad to get together to discuss these issues and believe that more research needs to be done.

“I believe this information is going to be good for the future, we need a strong position about water, we have all kinds of uranium here, big potential, other metals, soon they will come to mine. We don’t want our water to be destroyed. We know pollution will eventually come here. The wind and water movement will affect us in the future. We don’t want our water destroyed, we have to watch, we need a strong position. You will need to develop a strong position paper.” - Echodh, September 29, 2017

The Elders highlighted several issues and made some recommendations:

- Economic development must be balanced with rigorous environmental reviews and conservation ethics from Indigenous perspectives so there is no further damage to the remaining freshwater systems in the Athabasca region.
- There is a definite need for on-going research in other communities that are situated on Lake Athabasca. These include Uranium City, Camsell Portage, Fond du Lac, Stony Rapids, and Hatchet Lake as well as other regions that are under the umbrella of the Prince Albert Grand Council. Developing stewardship plans and articulating Watershed Governance require evidence-based research.
- There are serious environmental and health implications related to climate change and industrial activities. Indigenous Peoples are the most vulnerable. To the Denesuline Peoples in the Athabasca region, water is life. Without clean water, there is no life.
- The David Suzuki Foundation, as well as leading environmental organizations, Indigenous groups, and First Nations communities, are calling on Prime Minister Trudeau of the Liberal government to restore protections of lakes and rivers that were stripped by the former Conservative government.

The health of water contributes to the health and well-being of Athabasca communities. According to the Denesuline worldview, the lakes, rivers, land, animals, plants, and people are interdependent. When one aspect of the natural world is disrupted, there are domino effects.

Elder Bert Herman from La Loche says that the teachings of the old people must be passed on from generation to generation;

“Our Elders taught us to respect our lands and what it provides for us, in Dene we say ‘nuhech’alanie’, the life path that all of us walk on. We are taught those ways from a young age and carry on those ways for the rest of our lives. We make sure that when we take anything from the land, we do not take it all, we also do not destroy the land so that nothing can live on it. The land is who we are, we come

from the land and we go back to the land when our journey here is done, this is the dene way.” – Bert Herman, Echodh, September 29, 2017

Allan Adam shared 7 values and 13 principles which were passed on to him by his parents and through different sources and projects that he did in the past. They bear resemblance to the guiding principles of other First Nations or Indigenous groups. They are taught by Elders, parents, and community members.

The guiding principles are teachings that are passed on from generation to generation. Each subsequent generation is taught different aspects throughout their life. They are now beginning to shift toward more English usage by young people, so parents have resorted to teaching these values in that language. Some use both English and Dene in their teachings. It is in this way that Denesuline culture will move ahead in the future, ensuring that Nuhech’alanie or ‘our path’ will not be forgotten.

Youth Involvement...

Youth were involved in the Land-based Spiritual Camp at Great Slave Lake where they learned about the Denesuline worldview, values, and interdependent relationship with the land, lakes, and rivers. They were also involved in knowledge mobilization, sharing circles, ceremonies, feasts, and Elder teachings.

Treaty 8 Mackenzie All Chiefs Water Gathering Initiative

Michael Freer, Treaty 8 Tribal Association of BC



The Treaty 8 Tribal Association (T8TA), in collaboration with Treaty 8 First Nations across BC, hosted an 'All Chiefs Water Gathering/Summit.' The goal was to collaborate on the conservation, healing, and protection of shared waters in the Mackenzie River Basin. The intent was to build Treaty 8 Nations' political strength and leverage, build Nation-to-Nation shared decision-making approaches, and implement the Mackenzie River Bilateral Agreements. This initiative stems from the Assembly of First Nations Resolution (AFN 87/2016) indicating their support for this initiative. In its first phases, the initiative implements the BC Treaty 8 Chiefs Resolution to the AFN Special Assembly (No.87-2016) to call the first-ever meeting of all the Treaty 8 Chiefs (NWT, AB, BC, SASK) to develop a unified approach to

water governance across T8. During Phase 2, the project team will host regional planning workshops in T8 communities across the Mackenzie Basin to build community and political support for the final gathering.

A workshop was held in Fort St. John March 28-29, 2018, with the goal of establishing interest in a gathering on water priorities, building alliances and capacity, and sharing tools for transboundary water management. During the workshop, participants expressed their concerns with water, including the degradation of fish, wildlife, water quality and water quantity. Workshop participants expressed broad support for moving forward with a Gathering of the Treaty 8 Nations as soon as possible and a number of milestones were achieved in planning for the gathering. It was agreed that the goal should be to build relationships and unity among the First Nations signatories of Treaty 8.

The last week of July 2018 was selected as the best time of year for this Gathering. Sturgeon Lake or Horse Lake were selected as potential locations. Five days were required for the Gathering: the first day would focus on ceremony, healing, and relationship-building; the second day would be about celebration; on the third day, communities would begin to address water and governance issues.

Elders and youth from each community were invited to participate and take a central role in the Gathering. It was made clear throughout the workshop that the Gathering needed to be an Indigenous-led initiative, driven by community champions knowledgeable of their nation's



culture and protocols. There was recognition of a need for the Chiefs and Council members present in the room to go back to their communities and speak to their people to get support for the Gathering. There was also recognition of the need to ensure all 39 Treaty 8 communities were involved in these initial discussions.

The second day of the workshop focused on discussing tools for collaboration on water governance and managing water across boundaries. Lands staff had an important role to play in facilitating the process of working together and collaborating on water issues. Guest speakers presented on various water governance tools, including legal tools under the *Water Sustainability Act*; the open-access Mackenzie DataStream; current initiatives on water quality concerns relevant to Treaty 8 First Nations; data analysis and visualization tools; and the guidebook to the *Alberta-Northwest Territories Mackenzie River Bilateral Water Management Agreement*.

What we learned...

The two days of meetings were well attended by First Nations from across BC and Alberta and a commitment was made right away to reach out to Treaty 8 Nations in the NWT and Saskatchewan. Overall, the conversation centred on water and its importance to all of Treaty 8. All in attendance at the workshop seemed to agree that a large Gathering of the 29 Treaty 8 nations should take place. During the meetings, many statements were made by Chiefs, Elders and community members. Some of these statements are included as follows:

“Water is a big concern for us, it borders our lands. Whatever happens up the river happens to us. We are here to see what we can do to support T8TA First Nations to make sure that water becomes part of our responsibility. We need to challenge the government and Europeans about their treatment of our waters and our people. There is no such thing as a right, there is only responsibility. The way the elders taught me was to say what your responsibilities are. I have a problem with the regulatory system because they do not include us. They consult us, but they do not accommodate us. How are we going to make sure that the government is accommodating us in our responsibility towards water?” - Chief Roy Fabian

“Water is the most important thing in our communities. Trying to protect is so important to our land and to our people. Not one person can say they can live without water – we all need it. We have to protect it for our future generations. We have to try our best to protect our water for us and our land.” – Chief Lynette Tsakoza

“We’ve been taught in school about how we ‘survived.’ I contest that in our language there is no word for ‘survival.’ I always talk about aboriginal beliefs, knowledge and skills. They came from the land, we applied what the land taught us to apply. There was no survival on the land. Aboriginal people were thriving on the land. Now we are surviving. We didn’t struggle to survive before, today we struggle to survive. Because our capacity as aboriginal people has been taken away from us, today we struggle to survive. Water is becoming scarce because water is scarce animals are becoming scarce. In the next 50 years, there is going to be a huge loss of species, that’s going to include 50 million people. We as a human

race are in trouble unless we change what we are doing. Yes, today we struggle to survive, but our forefathers didn't struggle.

To me, the Indian Act only applies on the reserve. My rights outside of the reserve are 100% what my forefathers did on the land. We don't want the Indian Act to tell us how to live. We don't want to get rid of it—we want to change it, we want to change our relationship with the Indian Act. It's an important relationship. When we made treaty with Canada, Canada had to come up with policy and a way to implement the Treaty. They did it all wrong, but as Aboriginal people – outside the reserve we don't have to follow the Indian Act. We need to clarify those issues. We need to make sure we don't misrepresent who we are. This is going to be about us, as Treaty 8 People.” – Chief Roy Fabian

“Whatever happens up here, Peace River, directly impacts us at home. There is a deep fear. One, BC Hydro did their own environmental assessment on Site C, how is that legal? Two, they are turning away nations saying there will be no impacts to rights and interests. When they first built the Bennett Dam, there were deep impacts, changes to water levels and quality. The Peace River is such an important river. Water is life, we can't eat money. We don't do anything at Beaver First Nation for money—we do things in a forward-thinking way. Money comes and goes, but the land is there forever. We have a hard time trying to understand land ownership. We don't own the land, we never owned the land. There is no such thing as land ownership, the land owns you. We have to shift our own thinking, we have to think about our children. I know our issues aren't going to be fixed by me or anyone else at this table – it's going to be our kids.

Water is number one. We came here to support anything and everything that T8TA would like to do to support water. We have a real fear of water quality, water shortage. We have to do everything we can. You don't have to be a leader to speak your mind. We need everybody to stand up. If we teach our kids that that drop of water is the most important thing on the planet, they will grow up respecting it.” – Chief Trevor Mercredi

Changes in Water Quality, Flow, or Water Levels

- Forest Fires in the Northwest Territories have increased substantially, largely due to the damming of the Peace River, and a reduction in the water table which prevented fires in the past.
- Water levels across the basin are low – this affects fish spawning grounds in the Peace tributaries
- Water levels appear to fluctuate more and are more unpredictable than in the past. “100-year” floods and droughts become a regular occurrence

Other Issues and Questions

“Whatever way you related to the land prior to the coming of the Europeans is your Treaty Right – so you decide. We decide what our rights are. They can’t tell us these are your Treaty Rights, as they’re written here. We decide. We’re putting everything on the table. Consultation is a very important process. Every time Canada comes to us, we say here are our Rights. We tell them what our Rights are.

In BC, does BC say they ‘own’ the water like Alberta does? We’re making a water plan and received a letter from Alberta saying we needed to apply for a licence. There are water tables going on that we’re not involved in. Some groups receive more rights than others—First Nations are 7th I believe. We’re talking about federal-level discussions, but how are we going to deal with the provinces? We need to be consistent. We have to be careful about these water sub-tables.”—Question from Chief Trevor Mercredi

“Co-management is important. We share the land with Canada, we didn’t give it away. How can we do integrated processes, using scientific and traditional knowledge? For example, include the fishermen in the process – they have a lot of knowledge developed over decades of fishing. This knowledge needs to be considered too. We need to think not only about what we can do, not only the scientific process but other groups that have been managing resources and see how we can work together to manage these systems. We need to look at this process and see what we can do to integrate our knowledge (First Nations, foundations, industry, etc.) and manage better. We need to make sure we’re all at the table, not just industry and the government. We need to be there. As Treaty 8 First Nations, we need to put our rights on the table and tell them they can’t ignore us anymore.” – Chief Roy Fabian

Youth Involvement...

While Treaty 8 acknowledges the importance of youth and youth involvement, and their participation will be integral to the success of a Treaty 8 Gathering, the meetings that took place in March of 2018 were attended by community leaders and lands staff. At this phase of the project, the youth were not involved.

Mikisew Cree First Nation Community-Based Monitoring Plan: Implications on Traditional Harvest and Community-based Mitigation Strategies



**Melody Lepine, Jocelyn Marten,
Mikisew Cree First Nation,
Government and Industry Relations
and Bruce McClean, McClean Consulting**

The Community-Based Monitoring Program is based out of Fort Chipewyan, Alberta and aims to understand the negative changes Elders have observed in the traditional territories. Of greatest importance is the need to better understand the negative changes to water quality and quantity in the Peace-Athabasca Delta. Findings have identified serious concerns with water quality, which constrain access to traditional areas, as a result of hydroelectric development, oil sands extractions, and climate change. Project objectives are to implement a Navigational Hazard App with the Community Based Monitoring (CBM) staff and community members together to continuously update a database of navigational hazards. The data will assist communities to adapt to navigational changes occurring in the Peace-Athabasca Delta. This App will be used in

conjunction with other tools (such as expanded CBM monitoring, revised policies, water diversion structures, dredging, modified Peace River flows) to manage water levels in the PAD.



The database system will better enable the integration of local and traditional knowledge about water quality, fish ecology, and fishing livelihoods in communities and regions. Findings have shown deterioration in water quality as a result of industrial development and have identified serious concerns with water quantity (flow), which constrains access to traditional areas.

The second threshold, an Aboriginal Extreme Flow (AXF), reflects a level at which widespread and extreme disruption of Treaty and Aboriginal rights occurs along the Athabasca River, its tributaries and the PAD due to a loss of access related to low waters.

What we learned...

The Mikisew Cree First Nation (MCFN) has borne witness to drastic changes to their homelands since the late 1960s, as a result of hydroelectric development on the Peace River, Tar Sands exploitation on the Athabasca River, and more recently as a result of these impacts combined with climate change. Elders have articulated the changes they have witnessed, and these Elders helped develop the Mikisew Cree Community Based Monitoring (CBM) program to track these changes.

One of the most pervasive problems facing the Mikisew is the change to water quantity. The combined pressures of hydroelectric development, water withdrawals for Tar Sands development and climate change have reduced the amount of water reaching the Peace-Athabasca Delta (PAD), upon which the Mikisew rely. Furthermore, the cycle of flooding the Delta requires to sustain its ecological balance has been disrupted. This has precipitated the loss of wildlife—notably muskrats and waterfowl—and created impossible or unsafe navigation in widespread locations in the PAD.

The Mikisew Cree are also worried that the changes to water quantity are likely associated with changes to water quality, and subsequently to fish and wildlife health.

This report articulates the noted changes in water quantity and describes how the Mikisew are tracking these changes with a custom App and database. The report also provides updates on the water quality and prey fish sampling in which the Mikisew CBM program is engaged. We hope that this will provide our Tracking Change partners with an overview of the major CBM themes in the Mikisew homelands, as well as results on our findings and actions.

The CBM program has been sampling water quality since 2008. Sites were subsequently refined and selected for monitoring four times per year; or during spring (May/June), summer (July/August), fall (September/October) and winter (February/March) of 2011 - 2016. However, due to staff turnover, budget, timing and unforeseen circumstances, sampling was not consistent across sites, and between years. Sites were selected based on community concerns, and to reflect and understand the influence of the Tar Sands.

Two reference sites (Pine Channel and Flett Creek) were also selected to reflect environmental circumstances outside Tar Sands-affected areas.

Water Health

The water quality sampled through the CBM program was assessed using the Canada Council of Ministers of the Environment (CCME) Water Quality Index (WQI) Calculator, a mathematical modelling tool that summarizes complex water quality data into a simple index that can be used to assess water quality (e.g., for the protection of aquatic life). The WQI Calculator is a reliable, rapid and cost-efficient way to screen multiple water quality parameters obtained from different water bodies that could be causing adverse effects to humans, animals and plants. The WQI can also help identify potential contaminants of concern that could be causing adverse effects on the health of the aquatic ecosystem. Summary results were presented in various formats for the



**Peace Athabasca Delta
Water Quality Monitoring**

- 1 Water Quality Index (WQI)**
used to summarize and display results from community-based monitoring in the PAD.
- 2 Distilling complex data**
that is easy to understand by using robust community-based monitoring data and the WQI.
- 3 Fair Overall Water Quality**
at study sites in the PAD since 2011, compared to 'Good' water quality at reference sites.
- 4 Iron, Manganese, Phosphorous**
are the compounds that most often exceeded water quality guidelines.
- 5 Rise in Aluminum & Turbidity**
detected after 2013. Could this a possible oil sands influence?
- 6 Poor/Marginal Water Quality**
at some sites, but these readings were only over a single year & not consistent through the years.

The Canada Council of Ministers of the Environment **WQI Calculator** is a tool that allows users to reliably, rapidly and cost-efficiently **screen water bodies** that could be causing adverse effects to **humans, animals and plants.**

Athabasca Chipewyan First Nation Mikisew Cree First Nation

community, including reports, presentations, and posters (Figure 1).
Figure 1. – Poster of water quality summaries

Fish Health

With Environment and Climate Change Canada, and with assistance from the Tracking Change program, the CBM program collected prey fish (minnows) from five sites in the PAD, starting in 2016.

Results show that mercury levels are higher in minnows collected in the surface mineable area of the oil sands, and generally decline downstream along the Athabasca River, with the notable exception of minnows collected in Lake Mamawi. These prey fish mercury levels correlate highly with high levels of mercury in gull and tern eggs in the PAD.

Youth Involvement...

Youth are fast adapters to new technology and it is anticipated that more youth will become engaged with the Navigation Hazards App as it becomes more widely used in the community.

For this introductory data collection year, youth were not engaged directly in this initiative.

Additional Projects:

Canoe Trip: Protecting our Environment for Future Generations

Kevin Ahkimmachie and Dustin Twinn
Treaty 8 First Nations of Alberta

While this project was completed in 2017 with additional funding from the Government of Alberta, a final report was not available as of the writing of this summary. The canoe trip led to Treaty 8's 2018 proposal to complete a large scale Placename Mapping project. Continuing into 2018/2019, the project will provide a final summary in the next Tracking Change report.



From the project proposal: The goal is to have 25 canoes (with one Elder and one youth) to represent each of the 24 Treaty 8 First Nations of Alberta and one to represent the Treaty 8 First Nations Organization. The trip will begin with a feast at Beaver First Nation; travel will launch from Fort Vermillion Bridge to Little Red River First Nation (Garden River) on the Peace River. Elders/knowledge keepers will share firsthand knowledge about oral histories, land stewardship, linguistic and world views, customs and traditions, and knowledge of the lakes and rivers of the territory to impart wisdom on preserving the lands for future generations. The community impacts of change will be documented, as well as TEK and possibly knowledge transfer. The data, interviews, and knowledge gathered will be held by Treaty 8 First Nations of Alberta. The information can be shared with partners and sharing of the information will be guided by the application of First Nations OCAP (Ownership, Control, Access, and Possession) standards and principles

Ya'thi Néné Lands and Resources Youth Science/Culture Camp and Canoe Quest

Diane McDonald⁵

Ya'thi Néné Lands & Resources Office

(Representing Fond du Lac, Hatchet Lake, Black Lake, Stony Rapids, Uranium City, Camsell Portage and Wollaston Lake First Nations)

Ya'thi Néné applied for funds from Tracking Change to contribute to these events as part of a much larger initiative. While the science camp went ahead as planned, unfortunately, due to staff turnover, the part of the project supported by Tracking Change (primarily the documentation of Indigenous Knowledge and observations of environmental change) was not completed.

Yathi Nene Lands and
Resource Office



⁵ New contact for Ya'thi Néné First Nation is Garrett Schmidt

From the project proposal: Ya'thi Néné Lands will be hosting the 1st Annual Science/Cultural Camp near the Athabasca Sand Dunes, located on the south side of Lake Athabasca, 20km west of Fond du Lac Denesuline First Nation. We will have five students from each of the First Nation communities of Black Lake, Hatchet Lake, Fond du Lac, and two students from Uranium City, Stony Rapids, Prince Albert and Saskatoon. Our goal is to raise awareness of the type of environmental monitoring that takes place in the Athabasca by CanNorth Company. High school students will be taught different types of activities that would be initiated on an annual basis by CanNorth, including but not limited to: fish dissection, plant identification, field assessment, water and sediment sampling, water temperature and effects. Cultural activities will include, caribou and moose hide making, beading, dry meat and dry fish making, hand games, crafts, fishing and elders circle talk. In addition to the camp, Diversity Talent will deliver Interactive Workshops, a Comedy Hypnosis Show, a Mentalist Act, a DeeJay Dance Party in the community of Fond du Lac and out on the land. During this event, BearPaw Communications will be filming to produce a Community Education Video.

The canoe quest will be a 4-5-day journey of travelling by canoe, supported with boat motors, with passengers (youth, chaperones, and elders) and guides. There will be four resting/hunting points, each significant for hunting for certain living species of fish (great northern pike, lake trout, walleye, whitefish), beaver, moose, geese, and to learn routes to travel by boat/canoe on Lake Athabasca from the guides. Older adults will also guide and teach youth how to set up campsites for tents, haul and identify different types of wood for a fire, and to haul water. They will also teach youth how to hunt for beaver, skin the beaver, prepare the hide for a pelt; and prepare the meat for eating. They will teach about: fish—varieties, locations, fileting, and use of various species; moose—how to hunt, their range, skinning the moose, storing the hide, using the hide; preparing the hide and using the different parts; geese—hunting and preparing geese to eat.

Tracking Change on the Liard River

Corinne Porter, Dena Kayeh Institute
and Vanessa Law, Daylu Dena Council

This project was deferred to 2018 and will be reported in the 2018 Tracking Change report.



From project proposal: This project will assist in documenting ecological change in the Mackenzie River Watershed, specifically the Liard River and its tributaries, as perceived by the Kaska Dena. Fifty to one hundred interviews will be conducted, traditional knowledge will be recorded and water monitoring sites will be identified to record changes in water depth. This project will support the objectives of the Kaska Water Strategy, adopted in 2015, by addressing data gaps within the Kaska Traditional Territory. It will also assist in addressing climate change monitoring. The project will assist in capacity development, by providing further work/training for the Dene nan yådä'. It will assist in further traditional knowledge documentation, provide a start to documenting climate change, help direct our monitoring efforts for the coming season and address data gaps that will be used in land and resource management and possible treaty.

Appendix 1: Research Insights So Far...

The findings of the 2016 community research projects are provided below for reference. The 2016 Report is available online at www.trackingchange.ca

- ✓ The Mackenzie River Basin is a network in which people are interconnected with the aquatic ecosystem in many different ways. A holistic understanding of the social, economic, cultural and ecological changes occurring in the Basin is necessary to ensure that aquatic ecosystems are managed in ways that ensure the continued health and well-being of the Basin's Indigenous communities;
- ✓ The Mackenzie River is a dynamic cultural landscape in which local economies and cultures have been shaped by the seasonality as well as year-to-year variability in the availability and condition of basin resources;
- ✓ Fishing is important to the culture and well-being of communities in the Mackenzie River Basin and is an inherent right protected both by the Canadian constitution as well as in treaties and comprehensive land claim agreements;
- ✓ More than 20 species and thousands of pounds of fish are harvested annually in the main river, the deltas and the numerous tributary rivers and lakes that comprise the Mackenzie River Basin. Fresh fish, dry fish and related dietary uses of fish have very high nutritional value, and are particularly important to food security in areas where other traditional/country food resources are variable or limited and where market foods are not an economically or nutritionally valuable alternative;
- ✓ Traditional practices for respecting (managing) fish and fish habitat are evident throughout the Basin. These practices have evolved based on generations of traditional knowledge. For example, 'take only what you need,' is the common principle for those fishing throughout the Basin;
- ✓ Indigenous communities play different roles in the governance of the Basin, depending on the jurisdiction. Although there are co-management boards and cooperative arrangements with territorial governments and the federal Department of Fisheries and Oceans that create opportunities for ongoing recognition of Traditional Knowledge in the management of fish stocks and key fishing areas in the Yukon and Northwest Territories, no such arrangements exist in British Columbia, Alberta, or Saskatchewan;
- ✓ In some jurisdictions, governments have created a clear role for traditional knowledge in decision-making about water resources. Where there is greater respect for traditional knowledge, resource conflicts are fewer. For example, in the Northwest Territories, respectful inclusion of traditional knowledge is embedded in the *NWT Water Stewardship Strategy*. In British Columbia, where resource conflicts and uncertainties about natural resources are more common, there is little to no recognition of traditional knowledge (see *British Columbia Water Sustainability Act [2016]*);

- ✓ Although practices have changed over the last century, contemporary harvesting and use of fish continues to contribute significantly to the diets and economies of Indigenous communities;
- ✓ The high cost of fuel, boats and equipment is a challenge for some community members highly dependent on fishing for food security;
- ✓ The nature of fishing livelihoods varies from community to community as a result of many environmental and socio-economic factors. For example, wage employment affects how much time is available for fishing with consequent implications for household food security (i.e., families who have less time to fish eat less traditional / country foods);
- ✓ In some communities where there is limited access to healthy water and fishing resources, there are concerns about the continuity of knowledge and skills beyond the current generation. For example, elders in northern British Columbia and northern Alberta have limited opportunities to teach their grandchildren about traditional fishing practices;
- ✓ Indigenous youth are seeking different kinds of opportunities to influence the governance of the Mackenzie River Basin to ensure that their rights and interests in fishing resources are respected for the future.

Unusual Observations and Patterns in Aquatic Ecosystems

- ✓ Across the Basin, there are widespread reports of decreased water levels and water flows, including dried up creeks. Such widespread observations may be the result of warming weather and lower levels of precipitation;
- ✓ Lower water levels are complicating access and use of places valued for fishing and related cultural uses;
- ✓ Water temperatures are reported to be warming with consequent effects on water quality, fish habitat, fish health, and fish abundance and distribution;
- ✓ There is more greening water or algal blooms in some areas, which has been attributed to increased development activity (e.g., agricultural activity in northern Alberta), as well as warming temperatures;
- ✓ Warming temperatures are reportedly affecting the movement of some species, the timing and location of spawning areas and, consequently, the timing and location of harvesting activities. Warming water is also perceived as an influence over the condition of fish including the size, health (e.g., lesions) and palatability of fish valued as food (e.g., softer fish);

- ✓ Warming temperatures are affecting the stability of permafrost in the northern regions of the Basin. Melting of permafrost is increasing riverbank erosion, with consequent effects on fish habitat, fish movements, as well as access and use of the river for fishing and related practices;
- ✓ There is an increase in observations of fish considered new or invasive to the Mackenzie River. Most notably is the increase in the incidence of salmon-catch; Fishers in some communities are observing different kinds of fish that are uncommonly found or never seen before in the Basin, such as salmon in many parts of the Northwest Territories, and other yet-to-be-identified species in Alberta.
- ✓ Warming winter temperatures have led to earlier break-up and later freeze-up in many areas. There are observations of extreme weather events, such as unseasonably warm winter days. As a result, there is more uncertainty in communities about ice safety and an increase in accidents associated with thinning ice;
- ✓ Extreme forest fire events such as those in Saskatchewan, the Northwest Territories and Alberta have created problems of ash in the water in some areas of the Basin;

Impacts of Resource Development

- ✓ Commercial fishing activities (including historic trade of fish resources to trading posts over the last 150 years), impacted fish stocks valued for food security in different regions, and particularly in the Peace-Athabasca and Slave River regions;
- ✓ Numerous contaminated sites throughout the Basin, such as abandoned mines and exploration sites, have altered the relationship of communities to places that were traditionally valued for fishing and other cultural uses. Most notably, oil sands mining activity in northern Alberta, the Giant Mine near Yellowknife, and the Faro mine in Yukon have fundamentally and adversely affected the value of local aquatic ecosystems, the cultural, economic and spiritual value of these places to local communities, and the capacity of First Nations to exercise their rights to harvest and maintain traditional livelihoods;
- ✓ In the Peace-Athabasca-Slave River systems, where hydro-electric projects have been developed and are expanding, lower water levels, decreased water quality and unpredictable water flows are fundamentally and adversely affecting the relationship of First Nations and other communities to these river systems, the integrity of sacred and cultural sites (e.g., burial areas), access to traditional fishing areas, the health of fish valued for food security, and many other related values and uses;
- ✓ Hydro-electric development in the Peace-Athabasca-Slave systems has changed water flows and the dynamics of the Delta. As a result, there is more uncertainty in communities about ice safety and an increase in accidents associated with thinning ice;

- ✓ In the southern part of the Basin (Alberta, British Columbia, Saskatchewan and southern Northwest Territories), there is limited access to key fishing and cultural use areas as a result of forestry, mining, petroleum extraction and hydro-electric development;
- ✓ The loss of biodiversity, including fish valued for food security by First Nations communities in the southern part of the Basin, has been impacted over the last century by both agriculture, forestry and petroleum exploration and development. For example, Lake Trout were extirpated from Lesser Slave Lake in the 1930s;
- ✓ In the provincial jurisdictions (Alberta, British Columbia, Saskatchewan), there is limited access to key fishing and cultural use areas, and compromised rights to fish, as a result of provincial government regulation;
- ✓ There are many concerns throughout the Basin about contaminated water and fish species; these perceptions of fish being contaminated and not healthy to eat are greater in the southern part of the Basin (i.e., Alberta, Saskatchewan, and British Columbia) where resource development activity is significant;
- ✓ There are ongoing and emergent resource-user conflicts between recreational anglers and First Nations and other communities who depend on fishing for food security, particularly where anglers use (disrespectfully) areas valued for food security and cultural use by First Nations communities;
- ✓ Community-based monitoring and collaborative research initiatives are becoming more common throughout the Basin; communities are producing their own data about the impacts of resource development, climate change, as well as other kinds of knowledge considered important for stewardship.

For more information, visit: www.trackingchange.ca

Appendix 2: Glossary

Community-Based Monitoring

Community-based monitoring is an activity that is growing in recognition globally, and a concept well used among communities and organizations in Canada, including Aboriginal communities. It is among a variety of tools and processes that have come to be associated with community-based resource management. Like other kinds of programs, community-based monitoring is based on the recognition that ecosystems and the natural resources valued by Aboriginal peoples, are complex and dynamic. Predictive tools, like environmental assessments, can result in rigid management approaches and have limitations in dynamic ecosystems. Adaptive management, which includes monitoring, is a more appropriate approach because it is more flexible and responsive to ecosystem uncertainties.

Local and Traditional Knowledge (TK)

Traditional Knowledge refers to the cumulative body of knowledge, practices and beliefs that have developed over many generations by local communities about ecosystems and their relationship to it (Berkes 1998)⁶⁶. It is referred to in different ways by different cultural groups. Fishers' knowledge can refer to both local knowledge (knowledge of an observed area) of both Indigenous and non-Indigenous fishers. Traditional Knowledge is unique from local knowledge in that it is longitudinal or based on many years, if not generations, of observing, experiencing and interpreting ecosystems; whereas local knowledge is more short-term in scope. It is because of this longitudinal scope, that Traditional Knowledge is increasingly recognized as useful in monitoring by many wildlife biologists and some other scientists, resource managers and governments who see opportunities to understand long-term ecosystem change. In this context Traditional Knowledge may be able to help answer the following kinds of questions:

- What kinds of patterns of ecological variability are characteristic of different areas of the Mackenzie River Basin?
- What kinds of unusual events or patterns are visible and to what extent are these associated with the impacts of climate change and resource development?
- What is the meaning and significance of observed trends and patterns of ecosystem change?
- What are useful indicators for tracking aquatic ecosystem change in the Mackenzie River Basin?
- How should we respectfully and meaningfully track these changes over time?

⁶⁶ Berkes, F. (1998). *Sacred Ecology: Traditional Ecological Knowledge and Resource Management*. Philadelphia: Taylor and Francis, 209p.

Capacity Building

The *Tracking Change...* program is focused on building capacity for partner communities in the Mackenzie River Basin to document and share local and traditional knowledge they consider relevant to the governance of the Basin. Capacity-building refers to advancing skills and knowledge needed for research and monitoring through training and mentorship. The program also aims to ensure experiential learning opportunities in which elders, youth and other members of the community are engaged in knowledge-building and multi-generational knowledge sharing. The kinds of capacity-building initiatives vary significantly from project to project and region to region, depending on a range of factors. Communities in settled land claim areas tend to have more capacity to carry out their work than communities in unsettled land claim areas. Those close to urban centers in the southern areas may be more or less advantaged than those living further north in the Mackenzie River Basin.

Appendix 3: Graduate Students involved in Tracking Change Community-led Projects in 2017-2018

Laura Gaitan – MA in Geography
Memorial University
Supervisor – Arn Keeling

Fond du Lac First Nation: Traditional Knowledge in the Athabasca Land Use Plan

This project focuses on the role of Traditional Knowledge related to water resources in land use planning processes. The work is being led by Fond du Lac First Nation and the local lands department. Drawing on oral histories and spatial data of Fond du Lac First Nation elders and land users, the project will contribute new insights about changes observed and experienced in the Athabasca (east), and key values and indicators for future monitoring and governance of this important watershed.

Iria Heredia Vasquez - MA in Geography
University of Ottawa
Collaboration with: Inuvialuit Fisheries Joint Management Committee
Supervisor – Dr. Sonia Wesche

Local and Traditional Knowledge Indicators for Tracking Socio-Ecological Changes in Inuvialuit Fishing Livelihoods

Given the vulnerability of northern ecosystems and communities, socio-ecological changes in the Mackenzie Delta region of the Western Arctic have a significant impact on Inuvialuit fishing livelihoods. Local and traditional knowledge from the Inuvialuit Settlement Region offers an opportunity to learn about change in this part of the Basin which is the furthest downstream jurisdiction. Drawing on an analysis of peer-reviewed and grey literature, and qualitative interviews conducted with ten fishers from the communities of Aklavik and Inuvik, this project examines how Inuvialuit fishers track and understand change in the Delta. Themes covered relate to a) determining the importance of Mackenzie Delta fisheries for Inuvialuit subsistence and livelihoods; b) documenting Inuvialuit knowledge about change regarding fish habitat and fishing conditions; and, c) identifying how fishers track and monitor changes in the Delta. We identify a range of temporally-and seasonally-sensitive indicators used by local fishers. Changes are observed in water temperature, water levels, slumps, fish quality, and delta-reliant wildlife populations.

Johanne Johnson - MA in Native Studies (Incomplete)
University of Alberta
Collaboration with Prince Albert Grand Council
Supervisors – Dr. Brenda Parlee, Dr. Shalene Jobin

Local and Traditional Knowledge in the Watershed Social Economy of Saskatchewan's Athabasca Basin Region

This project considers local and traditional knowledge (LTK) related to the Athabasca Basin Watershed and the social economy of the region. Within the Athabasca Basin Region, as in many other Indigenous communities, the social economy encompasses the notion of environmental stewardship. The first objective was to investigate and document the meanings of the social economy from the perspective of LTK holders. The second was to identify 'wise' Indigenous practices related to the successful development of the social economy of the Athabasca Basin Watershed.

**Lana Lowe – Ph.D. in Faculty of Law
University of Victoria**
Supervisor – Dr. Val Napoleon

Indigenous Oral Histories of Water

This project focuses on the importance of Indigenous oral histories about water and water use as law (indigenous legal orders) in the Peace River Sub-Basin. Working collaboratively with Fort Nelson First Nation, the research aims to increase understanding of how changes in the health of the water and access to water have altered the well-being of the community and what kinds of indigenous legal orders are needed to improved governance of the basin and heal the relationship between people and their environment.

**Chelsea Martin - MSc in Risk and Community Resilience
University of Alberta**
Collaboration with: Sahtu Renewable Resources Board
Supervisor – Dr. Brenda Parlee

Sahtu Goti'ine Traditional Knowledge: The Impact of Climate Change on Fishing Livelihoods

This project was developed with the Sahtu Got'ine of Deline who have, over many generations, developed valuable knowledge, practices and institutions that are deeply integrated with their spiritual worldview. Great Bear Lake, for example, is conceptualized as the source or 'heart' of the community and their livelihood. Traditional knowledge about local ecosystems, including ecosystem dynamics, is important to the continued sustainability of fishing livelihoods in this region and in many other northern communities. As the stresses of climate change and resource development grow, this knowledge will become even more important to the community and others concerned with the sustainability of the arctic environment.

**Tracey Proverbs - MA in Environmental Studies
University of Victoria**
Collaboration with: Gwich'in Renewable Resources Board and Gwich'in Tribal Council
Supervisor – Dr. Trevor Lantz

Social-ecological Change in Gwich'in Territory: Cumulative Impacts in the Cultural Landscape, and Determinants of Access to Fish

In the territory of the Gwich'in First Nation, environmental, sociocultural, and economic changes are affecting relationships between communities and the land and water. Two research projects were developed to explore the impacts of social-ecological change in Gwich'in territory by examining cumulative impacts in the cultural landscape, and determinants of access to fish and well-being. In the first part of the MA research, overlay analysis was used to quantify and map: 1) cultural feature intensity, 2) cumulative environmental disturbance, and 3) overlap between disturbances and cultural features. The project also included interviews with four regional cultural heritage experts, who contributed critical insights into representing Gwich'in cultural features. Many of the changes mapped are affecting fishing practices central to Gwich'in livelihoods. To understand these changes better, in the second part of the MA research, the relationship between drivers of access to fish and well-being amidst social-ecological change were explored by interviewing 29 Gwich'in individuals. The interviews showed that socioeconomic and environmental barriers have decreased access to fish. However, access to fish remains critical and related to well-being, driven by various socioeconomic factors. Many of these factors are reflected in sharing networks and adaptive practices that are encompassed in ecological monitoring and land-based education. These factors may strengthen Gwich'in fishing livelihoods, and highlight the importance of monitoring and land-based education programs.

Neal Spicer – MSc in Risk and Community Resilience

University of Alberta

Supervisor – Dr. Brenda Parlee

Collaboration with Dene Tha' First Nations and Kátł'odeeche First Nations

Despite fiduciary and legal requirements of the Canadian Government in ensuring First Nations communities' well-being, access to safe natural water sources and household water sources are frequently a massive problem for many First Nation communities across Canada. This research project undertaken in collaboration with communities of the Dene Tha' First Nation and the Kátł'odeeche First Nations, examines drinking water consumption patterns and water security levels. Although there are many potential outcomes of this research, the objectives are to a) ascertain which water sources are available in their area; and b) develop a tool to help quantify and ascertain levels of water security for First Nation communities to have a better understanding of the factors involved in water security and community members' concerns over their water.

Kristine Wray – Ph.D. Candidate in Environmental Sociology

University of Alberta

Collaboration with: Akaitcho Territorial Government / Deh Cho First Nations

Supervisor – Dr. Brenda Parlee

Linking Fishers Knowledge and Science to Understand Ecological Change in the Mackenzie River Basin

Efforts to link traditional knowledge and science to address issues of environmental change are increasingly common across the circumpolar north. This is particularly true in respect of building and interpreting evidence about historic ecological variability. While much of this kind of knowledge integration and co-production has developed in respect of wildlife species (e.g., barren ground caribou), little work in northern Canada has been done in relation to freshwater ecosystems and valued fish species such as lake trout and loche. Guided by social science research methodologies developed in marine ecosystem (e.g., east coast cod fishing communities) and techniques for otolith analysis, this project has been developed collaboratively with the Akaitcho and Deh Cho communities to develop oral histories about fish population dynamics and health in different areas of Great Slave Lake and link the stories about the health of fish in their region to scientific data.



