Integrating Indigenous Knowledge into a Community Contaminant & Climate Change Monitoring Program

Teslin Tlingit Council Community Report

2013

Prepared by the Yukon River Inter-Tribal Watershed Council

ONE PEOPLE-ONE RIVER

Yukon River Inter-Tribal Watershed Council

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Acknowledgments

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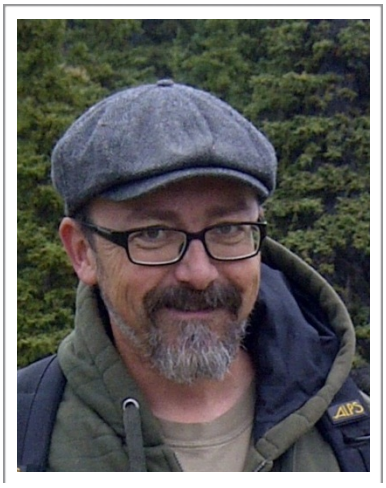

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Introduction

This report details the results of the Yukon River Inter-Tribal Watershed Council's community-based research project, "Integrating Indigenous Knowledge and Public Health Concerns into a Community Contaminant and Climate Change Monitoring Program" conducted with Teslin Tlingit Council (TTC).

Climate change and environmental degradation pose significant threats to Arctic and Sub-Arctic freshwater systems and their Indigenous inhabitants. Scientific studies indicate that these regions are among the first to experience the impacts of climate change
(Serreze et al. 2000; ACIA 2005; Hinzman 2005; IPCC 2007). Indigenous Peoples whose subsistence livelihoods rely on the lands and waters within their traditional territories are closely connected to their local geography and consequently, they are among the first to feel the effects of climate change (Berkes, Folke, and Gadgil 1995; Nyong, Adesina, and Osman Elasha 2007; Turner and Clifton 2009). Furthermore, environmental degradation other than climate change also has significant implications for subsistence livelihoods. Contaminants transported from local and long-range sources are known to impact traditional food systems in the Arctic and Sub-Arctic (Kuhnlein and Chan 2003). The Indigenous inhabitants of the Yukon River Basin have identified the impacts of climate change and environmental degradation to the Yukon River and its tributaries as major threats to their lives and livelihoods.

During open floor discussions at the Yukon River Inter-Tribal Watershed Council's (YRITWC) Summit in August of 2011, First Nations discussed concerns about their health risks, unpredictable events of climate change, and exposure to contaminants. First Nations called on the YRITWC staff to assist them with conducting community-based research to assess and monitor climate change and contaminants within their traditional territories (See Figure 1).

Text Box 1. What is the Yukon River Inter-Tribal Watershed Council?

The Yukon River Inter-Tribal Watershed Council is a treaty-based Indigenous grassroots organization consisting of 70 First Nations and Tribes, dedicated to the protection and preservation of the Yukon River Basin.[1]

Figure 1 Map of the Yukon River Basin

This project integrates Indigenous Knowledge of the environment into a community contaminant-monitoring program (i.e., heavy metals, hydrocarbons, nutrients, and bacteria) for six Yukon First Nations in 2012. The main question that this project aimed to answer was two-fold:

1. What concerns do First Nations have regarding climate change, public health, and contaminants?
2. What are the baseline levels of contaminants within these communities?

During this project, the YRITWC worked with the First Nations of Teslin, Selkirk, Tr'ondëk Hwëch'in, Kluane, White River and Carcross/Tagish in developing their research project and increasing scientific capacity of First Nation members. This report details the interview and focus group results of the research conducted with Teslin Tlingit Council aimed at answering the first question identified above. Water quality sampling aimed at documenting baseline levels of contaminants will be conducted at a future date.

Text Box 2 What Is Indigenous Knowledge?

Indigenous knowledge of the environment, also referred to as Traditional Ecological Knowledge (TEK), is defined as "a cumulative body of knowledge and beliefs handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment. Further, TEK is an attribute of societies with historical continuity in resource use practices; by and large these are non-industrial or less technologically advanced societies, many of them indigenous or tribal" (Berkes 2008: 7).

"Traditional Knowledge, as defined by the Teslin Tlingit Elders, is a way of life, which respects all living things and guides our relationships and responsibilities to everything around us. Teslin Tlingit Traditional Knowledge informs our understanding of the land, water, climate, seasons and animals within the Teslin Tlingit Traditional Territory. Teslin Tlingit Traditional Knowledge provides valuable lessons on Teslin Tlingit subsistence lifestyles, inclusive of hunting, trapping, fishing, harvesting, as well as Teslin Tlingit's history and relationship to historical lands, waterways and trails" (TCC 2012, 1).

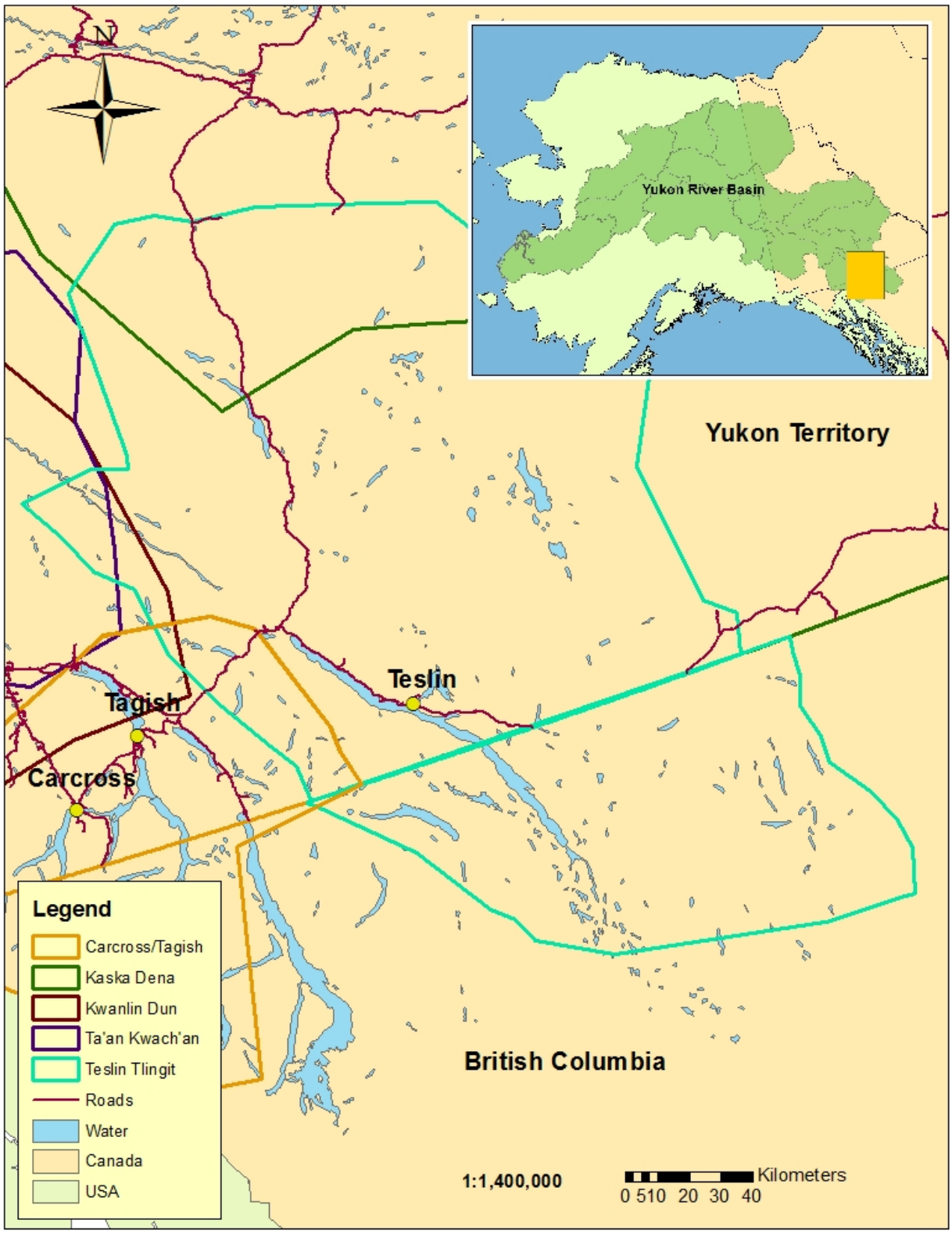
Community Context

The Teslin Tlingit are Inland Tlingit who reside in the village of Teslin, Yukon. The community is located on Teslin Lake, the headwaters of the Yukon River. The community of Teslin was originally settled in the 1940s during the construction of the Alaska Highway. However, this location had been used as a summer camp where people would rest as part of their annual round of hunting, trapping, and fishing. The Teslin Tlingit brought with them many aspects of Tlingit culture including their clan system, potlatch tradition and language. They continue to maintain these traditions today (Government of Canada 2004).

The Teslin Tlingit, originally the Teslin Indian Band under the Indian Act, were active participants in the negotiation of land claims in Yukon. In 1993, they became one of the first four Yukon First Nations to sign their land claims agreements and are today a self-governing First Nation. [1]

[1] http://www.cyfn.ca/ournationsttc

Figure 2 Map of Teslin Tlingit Traditional Territory



Research Design

This project is characterized by a community-based participatory approach. Community-Based Participatory Research (CBPR) is, first and foremost, designed to meet the needs of local communities: "In contrast to more traditional investigator-driven research, CBPR begins with an issue selected by, or of real importance to, the community, and involves community members and other stakeholders throughout the research process, including its culmination in education and action for social change" (Minkler and Wallerstein 2011, 1–2). This project also has a multidisciplinary research design, meaning that it uses methods from both the social and biophysical sciences to examine First Nation concerns related to the impacts of contaminants and climate change on water.

In the summer and fall of 2012, the YRITWC research team conducted interviews and a focus group with members of TTC. Semi-structured interviews were conducted with key stakeholders to gather in-depth information on the importance of water for the community as well as concerns about changes in water resources as a consequence of either contamination or climate change. Three interviews were conducted in total. All of these interviews were conducted with Elders. Interview participants were asked to describe the importance of water to their community and any changes in water resources they observed within their traditional territory. Interview participants' observations of change contributed to the identification of water quality sites of concern. A focus group was held at the TTC Healing Centre on November 1st. Five people attended the focus group. Therefore, a total of eight individuals participated in this research.

During the focus group the YRITWC used a participatory mapping exercise (Donovan et al. 2009) as a primary means for gathering data. Where possible, focus group participants identified, mapped and discussed sources of contamination and

the associated impacts on water resources. Using ArcGIS, a map of the Teslin Tlingit traditional territory was projected on a screen and focus group participants took turns identifying sites of concern on the map. A laser pointer was used to indicate the exact location. Sites of concern were recorded as points in ArcGIS 10, a spatial mapping program. A note taker recorded the site descriptions provided by participants including the suspected source of contamination. A total of 20 sites of concern were identified.

The YRITWC aims to complete water quality sampling at the sites of concern identified. During the focus group, the YRITWC used a voting process to prioritize the top five sites of concern. Each of the focus group participants was provided five stickers and directed to place the stickers on their areas of greatest concern. Participants could put more than one sticker next to a given site name. The names of all sites were written on a piece of paper and participants placed stickers next to the sites they felt should be prioritized for water sampling.

The research was designed in accordance with the Teslin Tlingit Traditional Knowledge Policy allowing us to provide research data to the TTC archive for future use. Research data will not be released without the consent of the individuals involved. Copies of all interview data were returned to the TTC Heritage Department for this purpose. The YRITWC considers this an important step in the research process as it allows First Nations to maintain traditional knowledge for their own use.

Results and Analysis

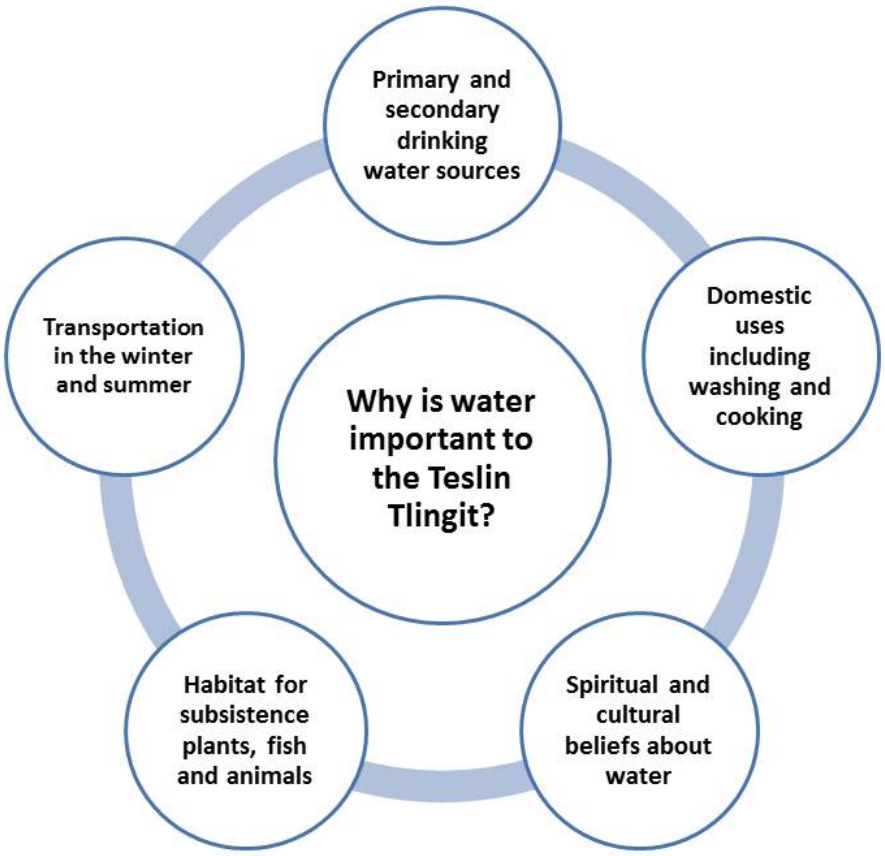
The Importance of Water to the Teslin Tlingit

Water is important to the people of Teslin Tlingit for many reasons. Interview participants were asked to answer the question '*Why is Water Important to Your Community?*' Their responses reveal that water is essential to all aspects of life.

> "It's our life, our lifeline. It keeps the animals and it grows everything. We are very particular about that water too. That's why we are so into it. It's a big thing. It's a lifeline. It has to be pure. And any place here in the Yukon, in the southern Yukon, you pick up a cup to drink and you never think anything. The water is pure all over in the Southern Yukon and that's why we treat it like that" (TTC Elder).

During the research project, many uses of water were identified (See Figure 3). Drinking water was one of the main uses of water discussed by participants. Primary and secondary sources of drinking water are used. Primary sources include groundwater water delivered to households using a pumper truck and private wells. Some individual consider these sources of groundwater undesirable as it is said to leave a black scum when used to make tea. A new drinking water treatment facility is also under construction in the community. Community members heavily use a number of secondary drinking water sources such as springs and creeks.

Figure 3 Why is Water Important to the Teslin Tlingit?



Water also provides important habitat for a diversity of fish and other wildlife. A focus participant illustrated the importance of this habitat for subsistence livelihoods by stating, "The Nisutlin River is the bread basket for the Tlingit People." Lakes and Rivers such as the Nisultlin and Teslin Rivers are also used as transportation corridors both in times of open water and when they are frozen over in the winter. The uses identified above makes it easy to see why water is integral to all aspects of subsistence livelihoods, which are central to First Nation culture.

First Nations also have long-held spiritual and cultural beliefs about water. In particular, Teslin Tlingit Elders discussed the need to respect water. The notion of

respecting water is similar to the First Nation beliefs about respecting fish and animals.

Documenting the importance of water is fundamental to establishing a community climate change and contaminants monitoring program for two reasons: 1) It allows us to understand how changes in water resources are impacting people 2) Cultural connections to water are also the inspiration for protecting water resources. The following section details the concerns that were raised about water quality and contaminants during the research process.

Observations of Changes in Water Resources

The purpose of this project was to understand the impacts of contaminants and climate change on water and public health for Yukon First Nations. The following sections detail community concerns regarding water quality and quantity and community observations of climate impacts.

Community Water Quality and Quantity Concerns

TTC community members described a number of concerns about water quality and quantity during interviews and the focus group. Their concerns included the impacts of sewage, past and current landfills, pesticides and development of new subdivisions on water (See Figure 4). They were also concerned about the elevated levels of arsenic found primary in drinking water sources including water from the pump house and found in private wells. Maintaining existing water quality was identified as a priority for

> "The Highway came through in 1942. And they, instead of cleaning up there chemicals and stuff, when they moved from camp to camp, on the highway, they dug just one great big hole way off in the big and nobody was supposed to go in there at all and they threw everything in that big hole and then they covered it up. There's one big place at Johnsons Crossing, up the Canol Road, up in there. Now, how long does it take to come out to contaminate the water?" (TTC Elder)

subsistence fishing, hunting and other uses of water. The impacts of future mining and exploration on water quality were raised as a concern. Water quality baseline studies are therefore necessary for documenting the impacts of future development impacts on water quality in both the Yukon and British Columbia portions of their traditional territory.

> "We don't use the well water because if you make tea with it, it just turns really black. I don't know if there is something in the water here. They should test all the towns they go to. They should be tested, especially if they got a water well because you don't know what's in it. You don't know what groundwater it is." (TTC Community Member)

> "Today, here, we can go anywhere and just take a cup with you or whatever you want to drink water, dip it and drink it. And there were places, not around here, I don't know exactly where they are at, that they can't do that. The biggest thing that has caused most of that is mining outfits. They don't care. They're there for the almighty dollar and they leave a mess when they leave and it's not cleaned up. All mining outfits, they should, like there's a place up here now that's going to, they're going to open it. I don't know when, but they call it Red Mountain. I've brought this up many times at different meetings, but we didn't have the right people. That water should be tested before they even get in there. Test the water. Test where the water runs from the mine and one of them runs right into the Nusutlan River. Lot's up people go up there. They go up there to pick berries and to get their winter meat and all that. And not only that if that ain't protected, we won't be able to eat our fish, drink our water or anything." (TTC Elder)

The specific sites associated with these concerns are identified on the contaminants map of the Teslin Tlingit traditional territory that was created during the focus group (See Figures 5 and 6). Twenty sites of concern were identified during this research. Sites identified during interviews were subsequently added to the map. Detailed descriptions of these sites were recorded (See Appendix A).[2]

[2] The sites of concern identified during the course of this research should not be considered an exhaustive list.

Figure 4 TTC Community Concerns Regarding Contaminants and Water Quality

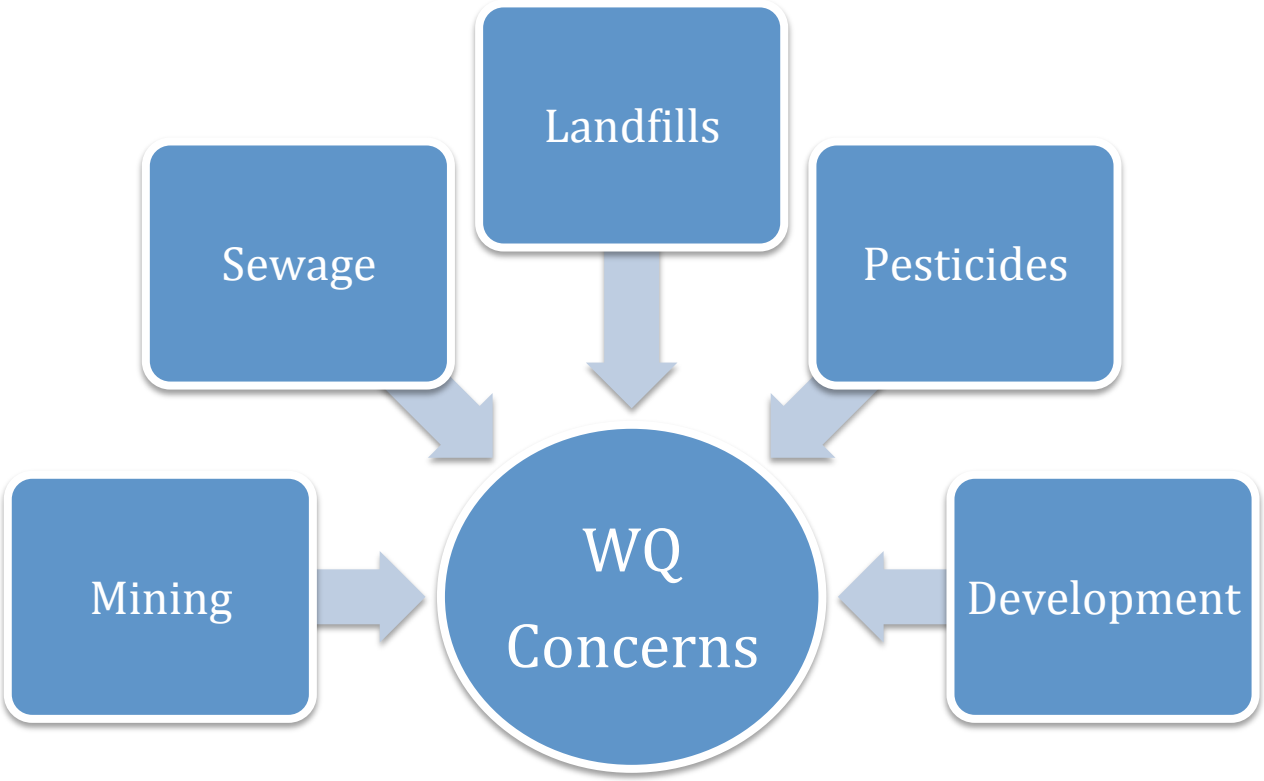


Figure 6 Participatory Contaminants Map in the Teslin Tlingit Traditional Territory

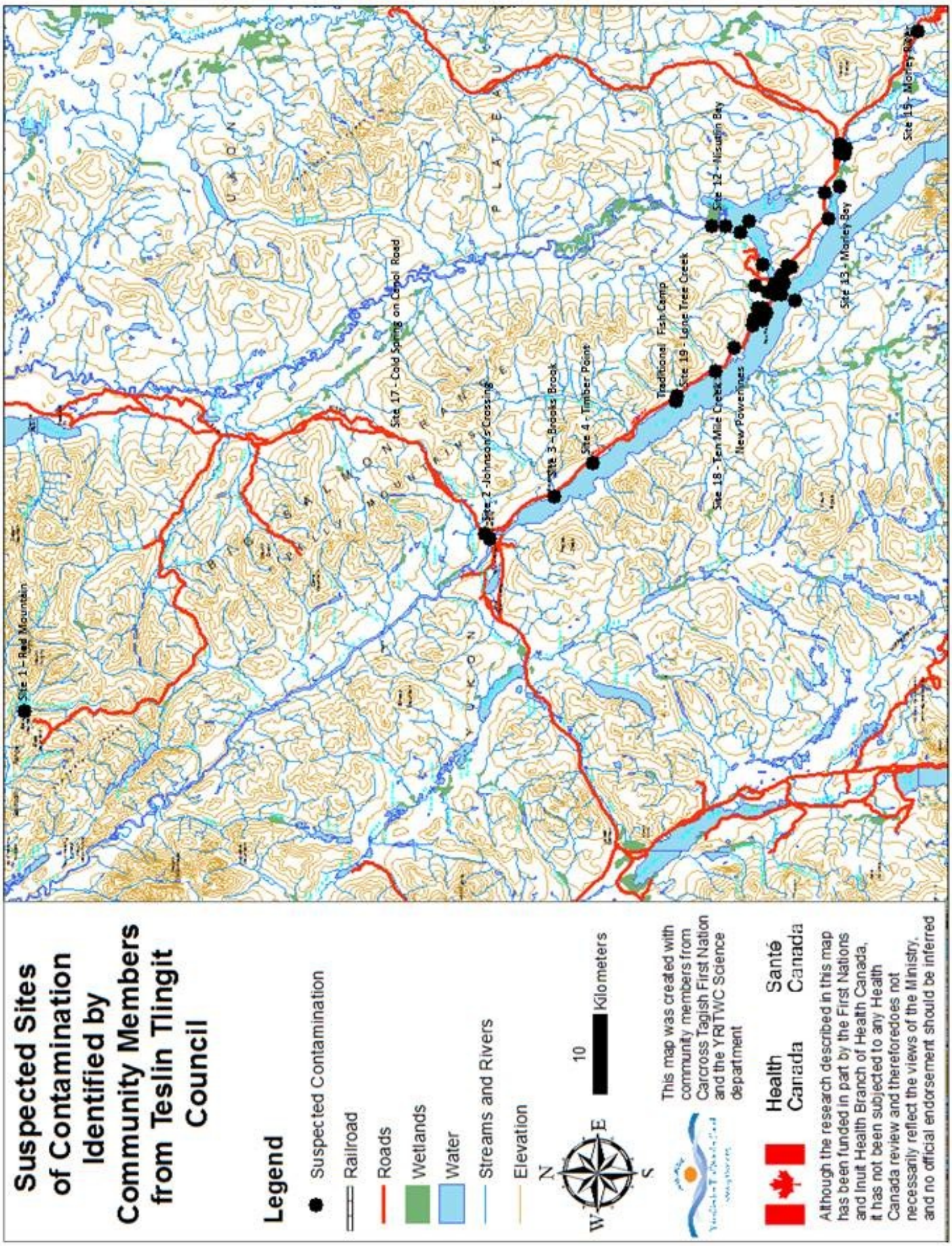
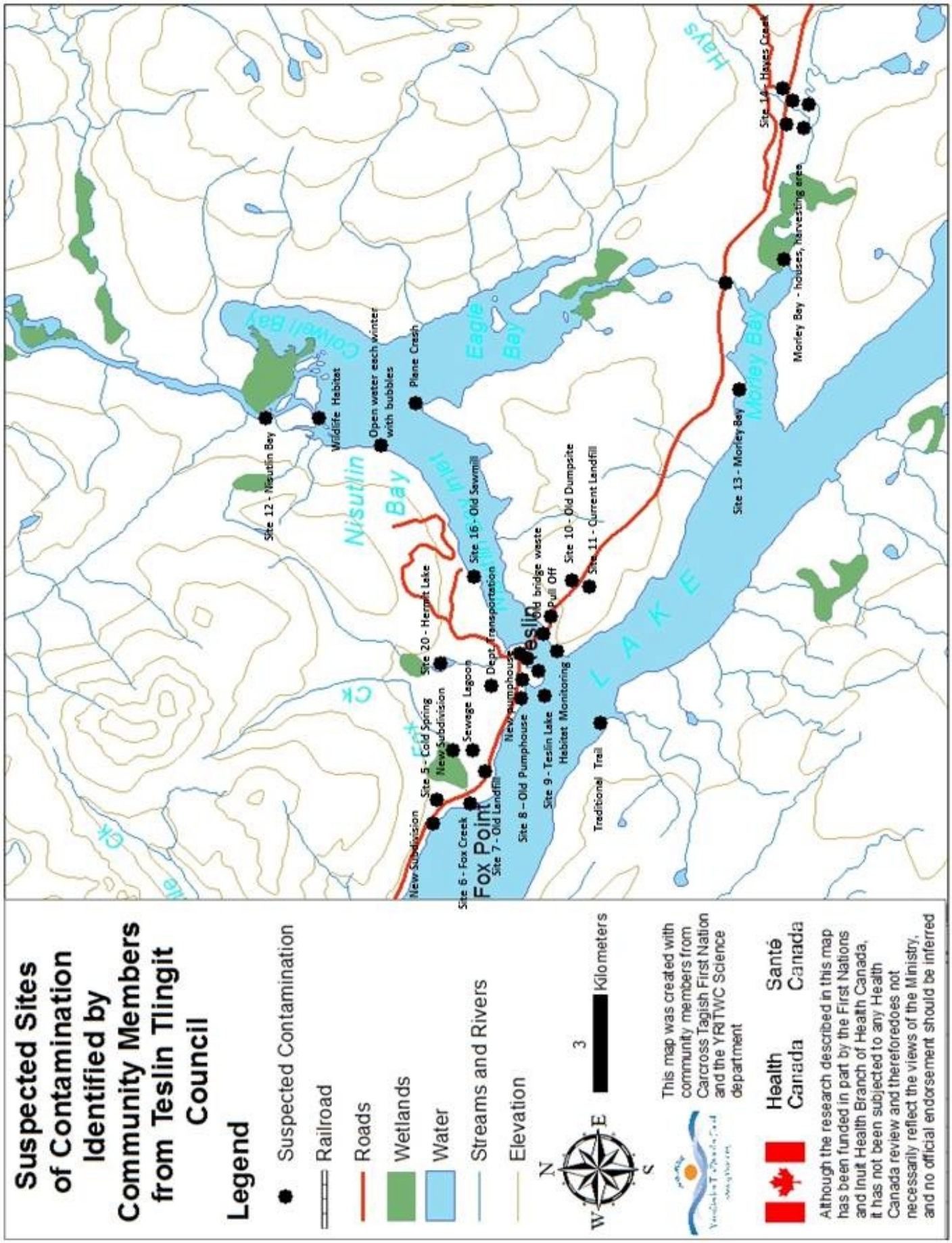


Figure 7 Water Quality Sites Identified in the Teslin Tlingit Traditional Territory, Near Teslin



Although the YRITWC did not have funding to conduct water quality sampling at the time this research was conducted, the project team are working to identify funding in order to conduct water and soil sampling at the priority sites identified. The following section details the concerns raised by research participants regarding the impacts of climate change within their traditional territories.

Observations of Climate Change

During interviews and focus groups, participants were asked if they had observed any changes in the environment that may be attributed to climate change. These observations included changes in the weather, water levels, river and lake ice regimes, plants, fish and animals. These observations are summarized in Table 1 – Observations of Climate Change in the Teslin Tlingit Traditional Territory. Observations are also illustrated by the quotes provided in the textboxes contained within this section. Many of these observations are consistent with observations of climate change elsewhere in the Arctic and Sub-Arctic (ACIA 2005; Environment Yukon 2011). Each of these observations provides important information regarding the

> "It's just an early, early winter coming to us. And we've had a cold summer too. We didn't have any berries, because it was minus something in June and that killed the berries. Other than that, it has changed it affects the berries and it affects the animals and it affects our gardens, when we plant out gardens and everything like that and it's just cold. Like right now, it's the same way here. We had a really nice winter last year. A lot of people whine about it when it goes down, but it's nice. Years ago in the 1930s, it was as low as 65 below." (TTC Elder)

> "There's a big change with the climate, even in, we grow all our own vegetables. We grow our own vegetables. Even in that, I noticed a big difference, A very big difference. Like the potatoes, they took a long time about two and a half weeks before they even start to sprout and then boom. Same with our carrots. Our turnips were the same. They were very, very small. All of a sudden, they just started to grow. The cabbage and everything was the same way. This is a climate change." (TTC Elder)

"On the 14th you used to be able to fish salmon, they are late. The rutting season of the moose has been late. It slowly started a couple years ago, but it changed quite a bit this year. Any time after the tenth you could call them in and after the 15th they will be on the full go. They were later than that this year. Even their travelling, the moose don't stay in one place. They get down in the flats. They get good and fat and then they move up high, up into the mountains where they peel. Where they peel their horns and polish them up. Any time after the tenth of September or so they start moving. You see tracks all over. This year it wasn't like that." (TTC Elder)

impacts that climate change is having on the environment and the people who call this region home. In combination with concerns about the impacts of contaminants on water and results from water quality sampling, observations of climate change are important in understanding overall environmental change and the affects these changes may be having on community members. The documented observations of climate change provide a basis for further research on the interactions between contaminants and climate change in specific aspects of the environment. The observations documented in this report could also be useful to the community as they seek to respond to climate change. This could include the development of community-based adaptation and mitigation programs.

Table 1 Observations of Climate Change in the White River Traditional Territory

Type of Change Observed	Examples of Change
Weather	• Warmer temperatures in the winter • Colder summers • Increased rain in the summer • Reduced snow • Unpredictable weather
Water Levels	• Some lakes at higher elevations are drying up, particularly up the South Canol Road • Cold springs between Rocky Point and Sandy Point where water was once collected is no longer there • Very high water on the river this spring
River and Lake Ice	• Ice takes longer to thicken • Freeze-up occurred early this year
Plants	• Poor berry crops

	• Berry crops have been slow to ripen
Fish & Animals	• Reduced salmon runs • Later salmon runs • Moose are rutting later • Fewer rabbits • Fewer grayling • Fewer geese and ducks

Study Limitations

Research conducted with TTC was limited in two ways. First, time limitations meant the researchers were only able to speak to a small number of community members. While these eight individuals where very knowledgeable, future phases of this research should incorporate more interviews with Teslin Tlingit community members and particularly Elders. Second, this research was limited to a social science exploration of concerns regarding the impacts of contaminants and climate change on water. The next phase of this research should include physical science research, such as water quality sampling, to investigate the concerns raised by research participants.

Conclusion and Next Steps

The purpose of this project was to initiate a community contaminant and climate change monitoring program. The preceding report documents the steps taken during the project to accomplish this task:

- **Documented the importance of water to the Teslin Tlingit, which is a necessary first step for situating a community-based contaminants monitoring program.** Understanding the importance of water is fundamental to establishing a community climate change and contaminants monitoring program for two reasons: 1) It allows us to understand how changes in water resources are impacting people 2) Cultural connections to water are also the inspiration for protecting water resources;

- **Identified and mapped the sites of concern to community members.** The contaminant maps produced during this project document community concerns regarding the impact of contaminants on water resources in their traditional territory. While we were able to take water samples at ten of these sites, the maps can act as a resource for the community as they seek to further develop their water quality monitoring program;

  Next Step: Identify sources of funding to conduct water quality monitoring at the sites identified. Sampling throughout the open water season for at least three years would give a clear picture about any risk of contamination. This sampling would also allow for the establishment of a valuable set of baseline monitoring data which could be used as a reference for many years to come and allow for the assessment of changes over the years to come;

- **Documented observations of climate change.** Observations of climate change provide a basis for further research on the interactions between contaminants and climate change in specific aspects of the environment.

  Next Step: The observations documented in this report could also be useful to the community as they seek to respond to the impacts of climate change in their traditional territory. This could include the development of community-based adaptation and mitigation programs.

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Appendix A - Description of Community Identified Water Quality Sites of Concern

Site #	Name	Suspected Contaminants	Description
1	Red Mountain	Mining	Gold mine.
2	Johnson's Crossing	Hydrocarbons/Metals	US Army waste. Old army vehicles were buried at Brooks Brook near Johnson's Crossing along the Teslin River. It had also been a Yukon Government highway work site.
3	Nisutlin Bay	Hydrocarbons/Habitat Concerns	Site where vehicles have been dumped. This area provides important habitat for fish and wildlife.
4	Timber Point	Drinking water	There is a creek at Timber point that some people use for drinking water.
5	Cold Spring	New Subdivision	Water Quality and Quantity may be affected by the construction of a new-subdivision. Wells could affect ground water table.
6	Fox Creek	Sewage	Sewage Lagoon is located on the creek above the highway. Located in a swampy area. Sewage lagoon may be affecting water quality. It was observed that it is possible to smell the sewage lagoon when you are driving nearby.
7	Old Landfill	Leaching	Located near Fox Creek.
8	Old Pump House	Drinking water	Pump house is used to get drinking water that is delivered to houses in Teslin. Arsenic in the drinking water from the pump house. There is arsenic found in all the wells around the community.
9	Teslin Lake	Drinking Water/ Test all contaminants	Many people from Teslin still drink directly out of the lake. The lake also provides important habitat for fish.
10	Old Dumpsite	Leaching	Located across the highway from the current landfill.
11	Current Landfill	Heavy Metals/Hydrocarbons	Need to find spring nearby. Leaching from solid waste. Old Dump located across the highway.

12	Nisutlin Bay	Hydrocarbons/Habitat Concerns	Site where vehicles have been dumped. This area provides important habitat for fish and wildlife.
13	Morley Bay	Proposed Subdivision	Need a baseline to see how the construction of a new sub-division affects water quality.
14	Hayes Creek	Future Concern/Habitat	New gravel pit proposed near Hayes Creek at Morley River. TTC does not want a gravel pit there because of its location near the river. They have proposed another site. It is unlikely that the gravel pit will be constructed here.
15	Morley River	Road Construction	Concerns about the impact of road and bridge construction on River. Particularly concerned about metal bits from welding falling into the water.
16	Old Sawmill	Hydrocarbons/Habitat Concerns	Located in Nisultlin Bay. Vehicles were dumped in the river to try to change the channel of the Nisutlin river. There has been some testing done below where the cars were put in to see if there are contaminants, but nothing has been found. There is an area along the shoreline in Nisutlin bay which is open in the winter because of gas bubbles rising from the water.
17	Cold Spring on Canol Road	Drinking Water	Cold spring located on Canol Road is used as a source of drinking water. There was historically a lot of U.S. Army activity at this site as a consequence of the construction of an oil pipeline.. General concerns about the water quality.
18	Ten Mile Creek	Drinking Water	Source of drinking water.
19	Lone Tree Creek	Drinking Water	Important Drinking water source. Lone Tree Creek is also the site of a traditional fish camp. Community members continue to hold fish camp there.
20	Hermit Lake	Water quantity/Habitat	It is a good site to fish for grayling and a wellness area. Itshould be protected from development. The quantity of water has changed; there is very low flow. During spring runoff it is high. It is a good moose area. A subdivision is being built in the area so it would be a good time to do a baseline here.

Appendix B – Useful Water Resources

Data

Yukon Water- http://yukonwater.ca/- Here, you'll find information about Yukon's water resources. There is information about how water is used, managed and monitored. The following is a listing of reference material from the yukonwater site:

Climate Change

- Mayo Region Climate Change Action Plan (PDF 2.3 MB)
- Climate Change Adaptation and Water Governance Report. (PDF 1.2 MB)
- Summary of: Compendium of Yukon Climate Change Science: 2003-2011 (PDF 4.1 MB)
- Compendium of Yukon Climate Change Science: 2003-2011 (PDF 2.3 MB)
- Hydrology of the Bennett Lake Watershed: Contemporary Conditions and Potential Impacts of Climate Change (PDF 4.01 MB)
- Yukon Water: An Assessment of Climate Change Vulnerabilities 2011 (PDF 10MB)
- Yukon Water: A Summary of Climate Change Vulnerabilities 2011 (PDF 3.1MB)
- Yukon Government Climate Change Action Plan (PDF 2.2 MB)
- Climate Change and Water Intergovernmental Panel on Climate Change Technical Paper VI (PDF 7.11 MB)
- Arctic Climate Impact Assessment (PDF, 1.62 MB)
- United States Environmental Protection Agency National Water Strategy: Response to Climate Change (PDF, 11.4 MB)

Groundwater

- Yukon Wide Long-Term Groundwater Monitoring Program, Community of Whitehorse Wells, 2001-2010 Monitoring Data Analysis (PDF 276 KB)

Water Monitoring

- Yukon Snow Survey & Water Supply Forecast

1. http://www.env.gov.yk.ca/monitoringenvironment/snow_survey.php- The Yukon Snow Survey Bulletin and Water Supply Forecast is prepared and issued by Environment Yukon's Water Resources Branch three times annually after March 1, April 1, and May 1.
   The bulletin provides a summary of winter meteorological and stream flow conditions for Yukon, as well as current snow depth and snow water equivalent observations for 56 locations.

2. http://waterquality.ec.gc.ca/- The Fresh Water Quality Monitoring & Surveillance Division focuses on regular monitoring, surveillance and reporting on fresh water quality, and aquatic ecosystem status and trends.
3. http://www.ec.gc.ca/rhc-wsc/-The Water Survey of Canada (WSC) is the national authority responsible for the collection, interpretation and dissemination of standardized water resource data and information in Canada. In partnership with the provinces, territories and other agencies, WSC operates over 2500 active hydrometric gauges across the country.
4. http://www.env.gov.yk.ca/branches/environmental_programs.php- Environment impacts analysis; Contaminated sites monitoring; Assess and remediate Yukon Government contaminated sites.
5. http://www.kwanlindun.com/- Kwanlin Dun First Nation, Department of Heritage, Lands & Resources. Conduct continuous monthly seasonal water sampling at Michie Creek, southeast of Whitehorse.
6. http://www.taan.ca/- Ta'an Kwäch'än Council, Department of Lands, Resources and Heritage. Conduct seasonal continuous and continuous water chemistry sampling at sites within traditional TKC territory, on Takhini River, Flat Creek, Laurier Creek and Lake Laberge.
7. http://www.emr.gov.yk.ca/csi/index.html- Water Resources Branch: Water-related strategic planning, policy development and implementation; Regional water quality/quantity monitoring and research; Provision of expert technical advice regionally and nationally; Enforcement and compliance of the *Waters Act* and water licences; Administration of water security deposits; Share responsibility for managing Yukon waters with five other Yukon Government departments including: **Health & Social Services** (drinking water & private sewage disposal), **Highways & Public Works** (water & sewage provision in unincorporated communities), **Energy, Mines & Resources** (regulate placer mining activities), **Executive Council Office, Water Board Secretariat** (water licensing process), **Community Services** (project management services for community infrastructure).
8. http://www.hss.gov.yk.ca/environmental_drinkingwater.php- Health & Social Services monitors drinking water in town sites including Old Crow, Dawson City, Keno City, Mayo, Pelly Crossing (Selkirk First Nation), Carmacks (Little Salmon Carmacks First Nation), Faro, Ross River, Whitehorse, Haines Junction, Burwash (Kluane First Nation), Carcross Tagish, and Watson Lake. Sampling types include microbiological and water chemistry.
9. http://www.yukonwaterboard.ca/- The **Yukon Water Board** is an independent administrative tribunal established under theWaters Act. The Board is responsible for the issuance of water use licences for the use of water and/or the deposit of waste into water.
10. http://www.yesab.ca/index.html- YESAB was established under the *Yukon Environmental and Socio-economic Assessment Act* (YESAA), which came into

full force November 28, 2005. YESAB is committed to delivering an assessment process that works well for all Yukoners as well as all stakeholders. YESAB's goal is to ensure the assessment process under YESAA is the best possible arrangement for all interests.
11. http://www.env.gov.yk.ca/pdf/YukonWaterWellsSummary.pdf- Summary of Yukon water wells. Most current report dating May 11, 2006.
12. Reference Condition Approach Bioassessment of Yukon River Basin Placer Mining Streams Sampled in 2006. http://www.geology.gov.yk.ca/pdf/MPERG_2007_2.pdf
13. Yukon Water Resources Hydrometric Program Historical Summary 1975 – 2004. http://www.env.gov.yk.ca/pdf/hydrometricmanual2005.pdf