# NWT Water Stewardship Strategy

# Implementation Workshop

November 22-23, 2017

Dettah, NT

**Summary Report**

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# 1.0 Introduction

The Government of the Northwest Territories (GNWT) Department of Environmental and Natural Resources (ENR) invited water partners and other interested organizations to attend the 8th Annual Water Stewardship Strategy Implementation Workshop in Dettah on November 22-23, 2017.

The annual workshop brings water partners together to review the implementation progress of *Northern Voices, Northern Waters: NWT Water Stewardship Strategy* (Water Strategy) and the *NWT Water Stewardship Strategy: Action Plan 2016-2020* (Action Plan). The workshop is an opportunity for water partners to share information, knowledge and perspectives on water stewardship in the Northwest Territories (NWT). Previous workshop reports on the development and implementation of the Water Strategy and Action Plan are available on the NWT Water Stewardship Strategy website: nwtwaterstewardship.ca/?q=publications.

## 1.1 Workshop Objectives

The objectives of the workshop were to:

- provide opportunities for increased communication, knowledge sharing and relationship building among water partners;
- share updates on Water Strategy implementation activities, including findings from aquatic ecosystem monitoring and research;
- increase awareness of multiple knowledge systems and different research and monitoring approaches being used to inform water stewardship;
- review and discuss outcomes of the *2016/2017 NWT Water Stewardship Strategy Progress Review Summary*; and
- report and review Water Strategy research priorities.

See Appendix A for the workshop agenda.

## 1.2 Participants

Approximately 80 water partners attended the workshop, including representatives from Indigenous governments and organizations, territorial and federal departments, non-governmental organizations, academic institutions, industry, community representatives, and regulatory and renewable resource boards. The Water Strategy Aboriginal Steering Committee (ASC) also participated in the workshop, representing their respective Indigenous governments.

See Appendix B for the full list of workshop participants.

The workshop was facilitated by Michele Culhane (ENR).

# 2.0 Day 1 Workshop Summary

Day 1 began with an opening prayer and performance by the Yellowknives Dene Drummers. This was followed by opening remarks from Yellowknives Dene First Nation Councillor, Bobby Drygeese, and ENR Director of Water Resources, Robert Jenkins.

## 2.1 Introduction Presentations

### 2.1.1 Aboriginal Steering Committee (ASC) Update Panel

Members of the Aboriginal Steering Committee (ASC) provided an overview of their roles and responsibilities related to the ASC. ASC members emphasized the importance of traditional knowledge informing water-related decisions in the NWT and highlighted examples of common water quality and quantity changes observed in their respective regions. The ASC continues to provide guidance to Water Strategy initiatives, including the 2016-2017 NWT Water Stewardship Strategy Progress Review, Bilateral Water Management Agreement implementation and negotiation activities, and various research and monitoring projects. Members of the ASC panel included:

- Leon Andrew – Sahtu Secretariat Incorporated
- David Krutko – Gwich'in Tribal Council
- Phoebe Rabesca - Tłı̨chǫ Government
- Shin Shiga – North Slave Métis Alliance
- Dahti Tsetso – Dehcho First Nations

### 2.1.2 Water Stewardship Strategy Progress Review 2016-2017, *GNWT ENR*

Blair Carter (ENR) provided background information about the Water Strategy and Action Plans and a brief overview of the *2016-2017 NWT Water Stewardship Strategy Progress Review* (Progress Review).

The Water Strategy was released in 2010 based on input from NWT water partners. The first Action Plan (2011-2015) was released in 2011 and marked the beginning of the first five-year implementation phase of the Strategy. In 2015, an independent evaluation of Water Strategy implementation progress was completed. The evaluation helped inform the 2016-2020 Action Plan, which was released in June 2016.

ENR is in the process of updating the Water Strategy to reflect policy, legislation and program changes that have occurred since the Strategy was first released in 2010. The goals, vision, guiding principles and Keys to Success remain unchanged and continue to guide effective long-term stewardship of our water resources. The updated Water Strategy will have a new design and is anticipated to be available on the NWT Water Stewardship website in early 2018[1].

[1] NOTE: The updated *Northern Voices, Northern Waters: NWT Water Stewardship Strategy* (Water Strategy) was released in January 2018.

Conducting regular reviews of implementation progress is part of the Check Our Progress component of the Water Strategy. The 2016-2017 Progress Review is the first review completed since the release of the 2016-2020 Action Plan. The results of the review are summarized in the *2016-2017 NWT Water Stewardship Strategy Progress Review Summary Report*, which provides an overview of the status of all Action Items for 2017, describes major undertakings and includes examples of representative Performance Indicators from each section of the Action Plan. The raw data collected during the review are presented in the *2016-2017 NWT Water Stewardship Strategy Progress Review Comprehensive Raw Data Spreadsheet,* which provides a short status update for all of the 52 performance indicators and the 84 action items that were assessed.

Action Items were assessed based on the level of completion using a four-point scale – not started; in progress; complete; and complete for reporting period. Performance Indicators were assessed using specific measures developed for each Performance Indicator. Information sources for the review included document reviews, website analytics, meetings with lead water partners and a water partner survey.

The Progress Review is important to demonstrate that water partners are undertaking effective water stewardship initiatives and making progress towards implementing the vision and goals of the Water Strategy. Reviews will be completed for each implementation year of the 2016-2020 Action Plan.

## 2.2 Panel: Perspectives on Capacity Building, Leadership and Training

### 2.2.1 Local and Distance Water Stewardship Learning Opportunities, *Aurora College*

Sarah Rosolen (Aurora College) provided an overview of Aurora College's programming aimed at increasing community capacity in water management and aquatic research and monitoring. Relevant programs include:

- Environment and Natural Resources Technology Program – two-year diploma program based on experiential learning;
- Environmental Monitoring Program – five-week pre-technician program developed based on community needs;
- Northern Leadership Development Program – a module-based program created in partnership with the mining industry to develop management and supervisory skills;
- Environmental Monitoring Certificate – one-year program being developed based on community, government and industry needs.

Aurora College also works with various partners to provide additional water-related capacity building opportunities for students in the NWT. Partners include community governments, researchers, territorial and federal governments, schools, consultants, non-government organizations and other post-secondary institutions such as the Dechinta Centre for Research and Learning and Wilfrid Laurier University.

Many of the challenges with capacity development in the NWT can be linked to financial resource constraints, lack of coordination among research and monitoring programs and community partners, and often diverse capacity building needs across communities.

### 2.2.2 NWT Water Education and Outreach, *Ecology North*

Ecology North is a Yellowknife-based non-governmental organization established in 1971 to support a healthy northern environment. Water stewardship is one of Ecology North's five core program areas. Brenda Van Hauvart (Ecology North) provided an overview of Ecology North's recent water education and outreach implementation activities.

In 2017, Ecology North coordinated Canada Water Week in the NWT, which included hosting water film nights, water treatment plant tours, water stewardship educator training, school and classroom visits, a speakers panel and community events. Ecology North also hosted Rivers to Oceans day in June 2017, which brought together more than 250 Yellowknife students to participate in a series of hands-on water-related education activities.

Ecology North houses a substantial inventory of water education resources aimed at supporting northern educators. The inventory includes a science-focused educator resource portal, a local watershed model, a mobile water quality test kit, drinking water curriculum, and water stewardship activity books. Ecology North staff often use these resources by to deliver classroom water education programming.

The #loveNWTwater campaign was launched in early 2017 to promote the consumption of NWT tap water and discourage single-use plastic water bottles. More than 500 individual pledges have been made to date, in addition to five schools, four GNWT departments, the Town of Fort Smith, and the Gwich'in Land and Water Board.

### 2.2.3 On-the-land Water Education and Leadership Initiatives, *Tides Canada*

Tides Canada is a national charity organization with a mission to help Canadians secure a healthy environment in ways that promote social equity and economic prosperity. Steve Ellis (Tides Canada) provided an overview of the Tides Canada Northern Program. Northern Program priorities are to support northern leadership and capacity to respond to social and environmental change, support sustainable livelihoods in northern communities, promote land and water stewardship, and foster healthy culture and communities.

Tides Canada supports the following water leadership and education initiatives in the NWT:

- Indigenous Guardians Programs – land and water stewardship programs led by NWT Indigenous governments, using Indigenous ways of knowing and western science;
- Watershed Planning – supporting Indigenous governments to develop and implement sustainability plans for critical ecological and cultural areas in NWT watersheds;
- On-The-Land-Funding – supporting the NWT On-The-Land Collaborative, which pools funding for a diversity of on-the-land programs, including youth-focused cultural experiences and water monitoring activities;
- Information Management Solutions – supporting the development and implementation of solutions for communities to better manage monitoring data, including water-related information.

### 2.2.4 Water and Wastewater Management Training Programs, *GNWT Municipal and Community Affairs (MACA)*

Greg Hamann (MACA) provided an overview of training programs available to NWT community government employees working in water treatment, wastewater treatment and solid waste. Training and certification are important to ensure that communities live in a safe, healthy environment and are provided with clean, potable water. Courses for the Water and Waste Management Program have been developed to provide Community Works staff with the knowledge and skills needed for Water, Wastewater and Solid Waste Management positions. Varying levels of certifications are granted based on the completion level of courses and training hours spent in the treatment plant. In addition to providing courses, MACA offers on-site training, including sampling and operation, intake replacement, and maintenance planning.

### 2.2.5 Capacity Building, Leadership and Training Panel Questions

Q: *With respect to water licensing for community landfills and sewage lagoons, how do the monitoring requirements from industry impact the sites where communities want to monitor?*

A: There is interest from communities to do their own monitoring, particularly as training increases and more funding becomes available for communities to undertake monitoring. The training that MACA provides is intended to support communities in helping to apply for and comply with municipal water licenses.

Q: *Is the Indigenous Guardians Program well suited to be a program that produces and brings together traditional knowledge and western science? Has there been any consideration of standardizing the Guardians Program training?*

A: The success of Guardians Programs is rooted in the program being driven by community needs and delivered at the community level. Although there may be opportunities for standardized modules on topics such as climate change, management, knowledge sharing and bridging traditional knowledge and western science, the intent of the program is to serve land users at the community level. To serve this purpose, training should be about better understanding of culture, language revitalization, going out on the land, and experiential learning. It is difficult to standardize these types of training.

*Comment: Recently there has been a lot of discussion about the spectrum of different water monitoring methodologies being undertaken, ranging from people collecting samples, to human sensor type of approaches.*

Discussion: The Guardians Program is rooted in the idea that land users are already active out on the land, noting observations of change. These observations and insights are then shared informally with community members at the dinner table, over coffee and through word-of-mouth. When efforts are made to formalize and control these informal information sharing methods, the important information can often be lost.

In terms of intellectual property rights, it is important that credit for this type of information goes to the community and land users who provided the information. There is work underway with some Guardians Programs to develop a monitoring certificate program based on community needs and delivered by community members. The intent is to move away from teaching western science informed monitoring approaches. For example, Yukon University is developing a made-in-the-north Indigenous degree program where students can spend their first year on the land learning traditional skills, including hide tanning and setting fish nets. Students can then enter directly into the second year of the program.

## 2.3 Panel: Aquatic Ecosystem Monitoring and Research - Part 1

### 2.3.1 Community-based Water Quality Monitoring Program, *GNWT ENR*

Seth Bohnet, Community-Based Water Quality Monitoring Program (CBM) Coordinator (ENR), provided an overview of the CBM program and 2017 monitoring activities. The CBM program was launched in 2012 in response to community questions about water quality. The goal of the program is to build community capacity in water quality monitoring while also addressing community water questions. The program involves community members from 21 different communities in the NWT, ENR staff and other water partners.

Samples were collected from more than 40 sites during the 2017 field season. Most sites were located along the Mackenzie River. A number of activities are undertaken at each site:

- Data sondes are deployed – temperature, pH, turbidity, dissolved oxygen, oxidation-reduction potential (ORP), conductivity and chlorophyll data are recorded every two hours for as long as the sondes are in the water.

- Grab water samples are collected – samples are collected just below the surface of the water and indicate what is in the water at the time the sample is collected.
- PMD (polyethylene membrane devices) are deployed – passive samplers that pick up oil and gas-related chemicals (hydrocarbons) dissolved in the water.

ENR plays coordinating and supporting roles within the CBM program. These roles include providing ongoing training and support to community monitors, providing funding, analyzing water quality data and providing results back to communities.

### 2.3.2 Deninu Kue First Nation Aquatics Monitoring Program 2017, *Deninu Kue First Nation*

Kathleen Fordy (Deninu Kue First Nation) provided an overview of water stewardship implementation activities being undertaken by the Deninu Kue First Nation (DKFN) Resource Management Division. A number of partners are involved in DKFN water stewardship activities, including Akaitcho Territory Government, Akaitcho Aquatics Monitoring Program, Fort Resolution Métis Council, Hamlet of Fort Resolution, GNWT ENR, Fisheries and Oceans Canada (DFO), Environment and Climate Change Canada, and the University of Alberta. DKFN's water stewardship activities are primarily aimed at addressing community concerns related to water quality and fish health. Projects include:

- Little Buffalo River Angler Fish Survey – DKFN staff collect qualitative and quantitative fish catch information through surveys distributed to sport fishermen and fish samples.
- Little Buffalo River Water Quality Monitoring – DFKN staff collect weekly water quality data through grab samples and YSI sondes.
- Resolution Bay and Slave River Water Monitoring – water quality data are collected at three sites in partnership with the GNWT ENR CBM program.
- Water Treatment Plant Studies – DKFN staff collect source water quality samples from Resolution Bay, including samples for chlorophyll.
- Air Monitoring – passive air samples are collected regularly at Mission Island for mercury and other chemical analyses.
- Environment and Climate Change Canada and Northern Contaminants Program – DKFN members are hired to collect fish samples in support of Dr. Marlene Evans' research, which aims to identify spatial and long-term trends in persistent organic contaminants and metals in lake trout and burbot.
- Genetic Assessment of Inconnu in Great Slave Lake – DKFN staff provide relevant traditional knowledge information and assist in the field sample collection of inconnu.
- Tracking Change – DKFN participates in discussions related to identifying key environmental change indicators in the Mackenzie River Basin.

Key achievements that have emerged through these activities include: integrating traditional knowledge for DKFN areas of concerns, providing training and knowledge sharing among researchers and youth, establishing a baseline dataset for the DKFN traditional area and developing a network of partners. Key gaps that have become apparent include the need for improved communication among partners and greater youth and Elder involvement.

### 2.3.3 Dehcho Aboriginal Aquatic Resources and Oceans Management (AAROM) Water Quality Monitoring Program, *Dehcho AAROM*

Mike Low, a Technical Advisor for the Dehcho Aboriginal Aquatic Resource and Ocean Management program (AAROM), provided an overview of the program and highlighted 2017 water quality monitoring activities. AAROM is a federally funded program for regions without settled land claims. The program is aimed at addressing community questions and concerns related to fish health and water quality, and it seeks to involve Dene land users in data collection. Data are regularly communicated back to communities, where there is further opportunity for communities to identify relevant concerns. In 2017, fish and water quality sampling was undertaken in partnership with Kátł'odeeche First Nation, Kakisa, Sambaa K'e First Nation, Fort Providence, Jean Marie River, Fort Simpson and University of Waterloo researchers.

### 2.3.4 Dehcho K'ehodi Stewardship Program, *Dehcho First Nations*

Dahti Tsetso (Dehcho First Nations (DFN)) provided an overview of the Dehcho K'ehodi Stewardship Program and highlighted recent program activities. Following the *NWT Lands and Resources Devolution Agreement* (April 1, 2014), DFN began organizing regionally to develop Dene solutions to conservation. Through several camps and discussions held throughout the Dehcho region, community members emphasized the importance of culture and language for conservation. The Dehcho K'ehodi Stewardship Framework reflects these discussions and highlights the importance of being on the land, in the Dene way, to protect the land. The framework is based on three principles that facilitate *'conservation through culture':*

I. Dene Law, Values and Principles
II. Dene Language
III. Youth and Elder Mentorships

The Dehcho K'ehodi Stewardship Program was launched in 2016 with a series of pilot land-based programs aimed at implementing the framework. In addition to being involved in the Tracking Change research project, DFN participated in a project facilitated through the Indigenous Leadership Initiative, which sought to demonstrate the economic returns for land-based programming. In 2017, the Dehcho K'ehodi Stewardship Program was expanded to include the development of a Dehcho Guardians Program with support from the Dehcho Aboriginal Aquatic Resources and Oceans Management (AAROM) Program.

The roles of Dehcho Guardians are to support environmental enforcement through an '*observe, record, report'* approach, implement existing and new regional monitoring programs, and mentor youth on the ground. Efforts in 2017 were focused on establishing an identity for Guardians through uniforms, providing training opportunities, conducting a capacity inventory, hosting monitoring camps and delivering land-based projects. Discussions are underway to engage Guardians in the Enbridge pipeline monitoring program.

Long-term program objectives are to establish stable, multi-year funding, develop multi-stakeholder partners, expand to a year-round program, improve regional data management and support traditional land uses.

#### 2.3.5 Aquatic Ecosystem Monitoring and Research Panel Questions

Q: *How will the breadth and scope of Guardians Programs across Canada be funded? It seems that a lot of the funding is coming from standalone sources. Are there opportunities to merge funds from different places to fund all of the programs across Canada?*

A: The Indigenous Leadership Initiative lobbied the Federal Government to contribute $500 million to support Guardians Programs across Canada. In March 2017, the Federal Government committed to provide $25 million over five years across Canada as seed funding. We have yet to feel the impacts of this commitment and there has been little information on how to access these funds.

Q: *Where did the term Guardians come from? Stewardship has always been the basis of our Indigenous way of life and our role on the land.*

A: There is recognition that different groups use different terms to refer to the stewardship concept. For example Haida use the term 'watchman', the Innu use 'guardians' and many Australian programs use 'ranger'. However, 'Guardian' is the term that is being used nationally to unite these programs across Canada.

### 2.4 Panel: Aquatic Ecosystem Monitoring and Research - Part 2

#### 2.4.1 Global Water Futures Research Program, *Wilfrid Laurier University*

Anna Coles (Wilfrid Laurier University (WLU)) provided a broad overview of WLU's water-related research activities in the NWT. WLU and GWNT established a 10-year research partnership in 2010. The goals of the partnership are to expand the NWT's research capacity, inform public policy development and train highly qualified professionals in environment and natural resources management. Research themes are highly interconnected and include aquatic ecological health, water quality, forest fires, climate, hydroelectric generation, hydrological processes, plant community change, permafrost thaw and caribou. Most of the research is concentrated in the Scotty Creek and Travel Valley (Inuvik) areas. Major projects under the partnership include:

- The Changing Arctic Network (CANet) – A five-year, $8.2 million project used to purchase and install instrumentation facilities at remote field stations, enhance labs in Fort Simpson, Inuvik and Yellowknife, and GPS and GIS tools to map community responses to changing environments.
- Global Water Futures – A seven-year, $78 million project with national and international partners working towards improving disaster warning, predicting water futures and inform adaptation to change and risk.

- Northern Water Futures – A seven-year, $2 million project led by Jennifer Baltzer and 21 co-investigators. The project targets user-identified needs under four themes: 1) northern water resource management and security; 2) ecosystem and community health; 3) energy security and impact of industrial development; and 4) climate change impacts on infrastructure.

WLU is open to feedback and ideas on how to best share data in the NWT, discussing opportunities for collaboration and identifying ways to make WLU research more aligned with community needs. WLU recently opened a research office in Yellowknife with three water research staff.

### 2.4.2 Long-term Water Quality Monitoring Network, NWT Update, *Environment and Climate Change Canada*

Orla Tobin (Environment and Climate Change Canada (ECCC)) provided an overview of the Water Quality Monitoring and Surveillance Division (WQMSD) and associated water quality monitoring activities ongoing in the NWT and northern Alberta. Three large water quality monitoring projects are underway.

The Long-term Water Quality Monitoring Network was developed to monitor baseline status and trends in northern rivers, assess ecosystem health, and assess the impacts of human activities and climate change on northern river systems. Monitoring sites are located in areas of federal responsibility and are generally co-located with Water Survey of Canada hydrometric stations. There are currently 49 monitoring sites across the North: NWT (22), Yukon (12), Nunavut (14) and Alberta (1). A range of parameters are measured, including physical parameters, major ions, nutrients, total and dissolved metals, polycyclic aromatic hydrocarbons (PAH), and organochloride pesticides. Data from 2000-2015 are accessible through the ECCC website: https://www.canada.ca/en/environment-climate-change/services/freshwater-quality-monitoring/online-data.html.

The Water Quality Index (WQI) project summarizes complex water quality data by focusing on key parameters. The purpose is to simplify communication of river water quality status information. The index scores are calculated by ECCC for seven NWT sites annually, and are accessible through the ECCC website: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/water-quality-canadian-rivers.html.

The Canadian Aquatic Biomonitoring Network (CABIN) is a bio-monitoring program with a set of national, standardized protocols for the collection of freshwater benthic invertebrates (i.e., bugs that live in the riverbed).The standardized protocols allow for data sharing and comparisons between sites to assess river health. Models are also developed using CABIN data to help assess aquatic effects at impacted sites. ECCC provides CABIN protocol training for practitioners, field staff and project managers. Data can be stored and shared through the ECCC CABIN website: www.ec.gc.ca/rcba-cabin.

### 2.4.3 NWT Cumulative Impact Monitoring Program (CIMP), *GNWT ENR*

Julian Kanigan (ENR) provided an overview of the NWT CIMP program and highlighted recent Water Strategy implementation activities. NWT CIMP is an environmental monitoring program aimed at better understanding and monitoring cumulative impacts and environmental trends. The program uses both science and traditional knowledge to support informed decision-making.

Four primary activities guide NWT CIMP: 1) working with partners to understand monitoring and research priorities; 2) coordinating, undertaking and funding cumulative impact monitoring and research; 3) communicating results to decision-makers and public; and 4) conducting the NWT Environmental Audit (every four to five years) to assess the program and regulatory regime. The program is designed to meet the needs of the regulatory sector and generate information that can be used in regulatory decisions.

NWT CIMP provides funding through an annual request for proposals for both scientific and traditional knowledge projects. Proposal guides are available on the NWT CIMP website: http://www.enr.gov.nt.ca/en/services/cumulative-impact-monitoring-program-nwt-cimp.

NWT decision makers have guided NWT CIMP to focus monitoring and research on three priority valued components: caribou, water, and fish. Specific research and monitoring "Blueprints" have been developed for each of these three themes. The Blueprints inform funding applicants of NWT CIMP funding priorities and guide program work planning.

Through collaborative discussions with water partners, three key water monitoring themes were identified: compiling and analyzing existing data, understanding impacts of human and natural disturbances on aquatic systems, and collecting and analyzing baseline regional aquatic data in areas of development interest.

Relevant fish and water projects funded by NWT CIMP in 2017/2018 include:

- Impacts of wildfire on northern stream ecosystems;
- Hydrologic monitoring and modeling for improved stream flow forecasting in the Snare River Basin, NWT;
- Mapping permafrost disturbance and impacts to aquatic systems across the northern NWT;
- Long-term monitoring of Great Bear Lake fisheries and the aquatic ecosystem;
- Community and scientific monitoring of the Great Slave Lake ecosystem.

### 2.4.4 NWT Hydrometric Monitoring Network, *GNWT ENR*

Shawne Kokelj (ENR) provided an overview of the NWT hydrometric monitoring network. The network is made up of 98 sites, 41 of which are funded by the federal government and 19 by the territorial government. An additional 23 sites are co-funded by both the territorial and federal governments, while the remaining 15 are funded by other parties such as Parks Canada.

Common methods, standards and equipment are used to measure water levels across all 98 sites. At river sites both water levels and flow are calculated, whereas only water levels can be calculated

at lake sites. Network results data are available online on the Federal Water Office website: https://wateroffice.ec.gc.ca/. Often the data are deemed 'provisional' until they have been reviewed. In some cases data may be unavailable, which is largely due to data being flagged as being abnormal or odd, and thus requires further review.

Benefits of the network include compliance with a national standard, access to the latest equipment, ability to compare data to ensure consistency and productive of real-time data.

Challenges of the network include the need to consistently check sites to adjust to changes in the river bed, calculating real-time flows under ice, and preventing equipment from ice jam damage.

Data collected through the network helps to track water level changes and the associated impacts on the land, resources and people. The data are also used in infrastructure development, disaster management, and transportation planning in the NWT.

#### 2.4.5 Slave River and Delta and Great Slave Lake Community-Based Water Portal, *C-CORE*

Joseph Chamberland (C-CORE) provided an update on the Slave River and Delta and Great Slave Lake Community-Based Water Portal project. The project was initially funded by the Canadian Space Agency from 2014-2016 to develop a satellite-based water monitoring program for the Slave River and Delta. The program monitors key environmental indicators using both satellite imagery and community-based sampling data. Indicators include: water levels and flooding, course changes, temperature, ice build-up, sediment deposits and vegetation. The communities of Fort Smith and Fort Resolution were key partners and provided important insight on the most relevant types of information and data communication methods. Community members also took *in situ* measurements and samples.

In 2017, GNWT supported a three-year expansion of the project to include Great Slave Lake and parts of the Mackenzie River, effectively covering the three major water systems in the NWT. Water health indicators such as temperature, chlorophyll concentration and suspended sediment concentration (SSC) can be provided for these water bodies using past and future satellite data and real-time data collection. Fort Smith and Fort Resolution will continue to be key partners moving forward with the project. Additional groups have expressed interest in participating in the 2017-2020 project, including the Łutselk'e and Kátł'odeeche First Nations, the Northwest Territory Métis Nation, North Slave Métis Alliance, and the Dehcho Aboriginal Aquatic Resource and Ocean Management Program.

All data will be made available through free and accessible online services such as the Mackenzie Data Stream and C-CORE's web portal – NWT Water Monitoring Service. The web portal is being developed and will include quality, temperature, and sediment data for the Slave River and Delta region.

#### 2.4.6 Wetland Stewardship, Barrett Lenoir, *Ducks Unlimited Canada*

Barrett (Sonny) Lenoir (Ducks Unlimited Canada (DUC)) provided background information on wetland stewardship as it relates to the Water Strategy in the NWT. DUC is guided by three primary principles:

I. A waterfowl habitat conservation organization
II. Boreal programs are science based
III. Partnership-based approaches to address waterfowl habitat goals for the boreal forest

DUC has engaged in a memorandum of understanding with the NWT Treaty 8 Tribal Corporation to undertake a wetland mapping project in the Akaitcho region of the NWT. The goal is to produce ecologically relevant digital wetland inventories using remote sensing data and traditional knowledge. Although satellite maps exist of the area, there are knowledge gaps about the diversity, density and types of wetlands in the region.

The wetland mapping project will inform land-use planning for the Akaitcho Traditional Territory. The project will also contribute to DUC's ongoing work towards a comprehensive national boreal wetland inventory. Key goals moving forward with DUC's national boreal program include:

- increasing partnerships with all First Nations, Métis and Inuit in the NWT;
- increasing knowledge of the boreal landscape and promote conservation of wetland-rich habitats;
- developing a Wetlands Policy for the NWT.

## 2.5 Poster Fair and Photo Contest Display

### 2.5.1 Poster Fair

A one-hour poster fair session was held during the afternoon of Day 1. Water partners presented 12 posters related to recent or ongoing Water Strategy initiatives, including:

- A Collaborative Wetland Inventory Project to Advance Wetland Stewardship in the NWT, *Ducks Unlimited Canada*
- Celebrating NWT Water Resources: Public Outreach and Education, *Ecology North*
- Changing Hydrology in Baker Creek, *NWT CIMP*
- Circuit Rider Training Program, *Municipal and Community Affairs, Community Operations Division*
- Developing a Waste Management Strategy for the NWT, *GNWT ENR*
- Drops in the Bucket: How Aurora Research Institute is Contributing to the Water Stewardship Strategy, *Aurora College*
- Ground Temperatures and Thermokarst in the North Slave Region, *NWT CIMP*
- How will Fish Communities in Gwich'in and Inuvialuit lakes Respond to Climate Change?*, Wilfrid Laurier University*
- Patterns of Fish Habitat Use and Migration in the Slave River System: Using Traditional, Local and Scientific Knowledge, *NWT CIMP*
- Stable Isotope Analysis of Mercury in Fish of the Slave River Delta Region, *NWT CIMP*

- Understanding and Predicting Fish Mercury Levels in the Dehcho Region, *NWT CIMP*
- Zooplankton Communities and Water Quality in the Mackenzie Delta Area Lakes, *Wilfrid Laurier University*

PDF copies of the posters are available on the NWT Water Stewardship website: nwtwaterstewardship.ca.

#### 2.5.2 NWT Youth Photo Contest

The workshop featured a collection of water-themed photo submissions from NWT youth aged 25 and under. Youth were invited to submit photos and captions that captured why they love NWT water. More than 25 water-themed photos were submitted. After a close vote, six final prize winners were identified:

**Under 14 Years Old:**

| | |
|---|---|
| 1st place: | Leland Lennie-Andrew, Sahtu Sunset, Norman Wells |
| 2nd place: | Libby Day-MacLeod, Bootlake Beauty, Inuvik |
| 3rd place: | Wynter van de Velde-Weber, Mackenzie River, Norman Wells |

**14 – 25 Years Old:**

| | |
|---|---|
| 1st place: | Cole Dupuis, Escarpment Creek, Hay River |
| 2nd place: | Arlo Clarkson, Horn Lake, Inuvik |
| 3rd place: | Marisa Carter, Escarpment Creek, Hay River |

The collection of photos is available on the NWT Water Stewardship website: nwtwaterstewardship.ca.

## 3.0 Day 2 Workshop Summary

### 3.1 Transboundary Water Management Agreements Update

*Robert Jenkins, GNWT ENR*

Robert Jenkins (ENR) provided an overview and update on the status of negotiations and implementation of NWT's Bilateral Water Management Agreements (BWMA). BWMA activities are captured in Key to Success 1.5 under the Work Together component of the 2016-2020 Action Plan. Successful transboundary discussions, agreements and obligations with upstream jurisdictions help to ensure the waters of the NWT remain clean, abundant and productive for all time.

In 1997, the Governments of Alberta (AB), Saskatchewan (SK), British Columbia (BC), Yukon Territory (YT), NWT and Canada signed the Mackenzie River Basin Transboundary Waters Master Agreement (the Master Agreement). This agreement commits all six governments to cooperatively managing the water and aquatic ecosystems of the Mackenzie River Basin and makes provisions for the parties to develop BWMAs.

An agreement between the NWT and YT was signed in 2002. YT and NWT are discussing updating this agreement to align it with recently signed agreements. The NWT has had discussions with SK to negotiate a SK-NWT BWMA. SK has a legal review underway of draft SK-AB and SK-NWT BWMAs. NWT also is committed to discussing and developing a BWMA with Nunavut (NU) once their water strategy is complete. An agreement between the NWT and AB was signed on March 18, 2015. A similar agreement between BC and NWT was signed on October 15, 2015.

NWT engagement and Indigenous consultation on the transboundary water agreements helped shape completed agreements with AB and BC and will inform future agreements with SK, YT, and NU. Throughout negotiation and implementation, the Aboriginal Steering Committee (ASC) has provided valuable input. To ensure direct involvement by Indigenous governments, the ASC recommends representatives to sit on each of the respective Bilateral Management Committees (BMC) that are established for each completed agreement.

The BMC for the AB-NWT agreement was established in 2016. Three BMC meetings have been held thus far, mainly focusing on work-plan development and annual reporting. An Implementation Highlights report was released in March 2017 (www.nwtwaterstewardship.ca/transboundary-water-agreement-implementation). The report focuses on implementation activities during the inaugural year, 2015-2016. In November 2017 the GNWT and Government of Alberta released *Working Together to Manage Our Shared Waters* - a comprehensive annual report on the first year of implementation. The report is available on the ENR website: http://www.enr.gov.nt.ca/sites/enr/files/resources/ab-nwt_ar_exec_summary_eng_web_ready_171117.pdf.

Implementation work over the next five years will focus on identifying and implementing ways to synthesize and blend multiple knowledge systems, developing learning plans, refining triggers and objectives, improving estimates of consumptive use and naturalized flow, scoping a study to consider climate change effects on transboundary objectives, reviewing mercury data to determine interim triggers, refining and monitoring biological indicators and reviewing best practices for aquifer characterization and groundwater monitoring.

Discussions are underway to determine implementation priorities for the NWT-BC agreement. The first BMC meeting is expected in winter 2018. A state of the knowledge report was recently completed for the Liard and Petitot Basins.

Q: *In Smith's Landing we are hoping that the BWMAs will protect our waters. It seems from consultation meetings with industry that there is little knowledge of these agreements in place. We find that AB is operating in silos and it is difficult to make sure that all parties are aware of these agreements. Who is responsible for informing them?*

> A: Thank you for bringing attention to this. There is a BMC meeting planned for late 2017 and this issue of communication and awareness can be raised at the meeting. It is important that the BMC is aware of the need to have full awareness of the agreements.

Q: *How do the BWMAs address spills from industry? In the NWT we receive the brunt of the impacts from these types of events. How do the agreements protect us?*

A: The OBED spill in 2013 raised concerns about communication between jurisdictions in the event of a spill emergency. The NWT-AB BWMA commits the Parties to have emergency response protocols in place to address, mitigate and, where possible, prevent adverse effects to the aquatic ecosystem in the event of a water-related emergency (e.g., a spill). In the event of an emergency, the Parties must maintain clear communication and notify the other jurisdiction without delay.

Q: *The Canadian Electricity Association proposed two new dams on the Athabasca River. Local community members in Fort Smith have reported that the water level is very low, and there is suspicion that Bennett Dam is holding back water. There seems to be a gap between BC and NWT by having to go through AB. We are also concerned about new tailings ponds appearing upstream. How do we enact the BWMAs?*

A: With regards to upstream activities in AB, each jurisdiction has the right to manage activities in their jurisdiction. However, there are water objectives that have to be met when the water flows across the border into the NWT. The AB-NWT BWMA also establishes clear information sharing, prior notification and consultation mechanisms that commit the jurisdictions to consult, notify and share information on developments and activities that might affect the aquatic ecosystem in the other jurisdiction.

Comment: *It is important that the funding to undertake transboundary monitoring activities makes it to the community level so that we can work with our youth and Elders to develop and implement monitoring programs.*

A: We need to continue working together to develop partnerships and undertake monitoring to learn more about the aquatic environment. These are important concerns that will be brought up at the upcoming BMC meeting in late 2017.

## 3.2 Water Strategy Research Priorities

### 3.2.1 Overview of Water Strategy Research Priorities Survey Results, *GNWT ENR*

Blair Carter (ENR) provided an overview of recent survey results related to water partners' research priorities for supporting the implementation of the Water Strategy. During the development of the 2016-2020 Action Plan, water partners identified the need to communicate specific research questions to researchers to better align NWT water-related research with water partners' research needs. This resulted in Key to Success 2.1 H - *Identify research priorities to strengthen and inform the goals of the Water Strategy.*

In September 2017, ENR developed a short online research priorities survey that was circulated to water partners via email. The survey asked water partners questions about research topics, gaps and types of knowledge that are priorities for their Water Strategy-related work. The intent was to gain a general understanding of priority research areas that could be discussed at this implementation workshop.

In total, 24 water partners completed the online research priorities survey. Indigenous regional governments and community governments represented the largest proportion of respondents (37%), followed by academic representatives, GNWT staff, non-governmental organizations, and regulatory boards.

The survey asked water partners to rank a series of broad water-related research topics according to the importance of the topic for their Water Strategy work and community. The greatest proportion of respondents indicated that water quality (27%) and climate change (23%) were the most important, followed by social research connections between the health of the water and the people (14%).

When asked to expand on the broad topics, water partners identified a range of specific research questions and questions related to water quality, climate change and social research connections. See Figure 1 for examples.

**Figure 1: Topic-Specific Water Strategy Research Questions and Topics**

| Water Quality | Climate Change and Water | Social Research Connections |
|---|---|---|
| • What does the water quality tell us about threats to fish and other aquatic species?<br>• How are current and legacy industrial activities impacting water quality?<br>• What are the water quality impacts and implications of methyl-mercury contamination?<br>• What are the water quality impacts of municipal waste facilities on receiving water bodies?<br>• Summary of “normal” NWT ranges for specific water quality parameters. | • How will climate change affect certain ecosystems/regions' hydrological cycles?<br>• What are the impacts of increased forest fires on water and, subsequently, fish populations?<br>• How will climate change affect ice quality and permafrost and what are the implications?<br>• Increased traditional knowledge observations of environmental change. | • What are the implications of water quality and quantity research for people and communities?<br>• What are the barriers in the NWT to drinking tap water?<br>• Research that considers social perceptions of drinking water and approaches to Indigenous-led water governance. |

The survey asked water partners to consider the types of knowledge and information required to address the research questions and topics they identified. In most cases water partners indicated that natural science, local knowledge and traditional knowledge were all required.

75% of respondents indicated they would be willing to collaborate with or support a researcher undertaking water-related research in the NWT. This suggests that there is interest among water partners to collaborate with and support researchers undertaking water-related research in the

NWT. Overall, the survey provided valuable information about the broad Water Strategy research topics and types of knowledge that are important to water partners.

### 3.2.2 Strengthening Linkages Between Laurier's Research Plan and Community Information Needs

*Dr. Kelly Munkittrick, Cold Regions and Water Initiatives, Wilfrid Laurier University*

Kelly Munkittrick (Wilfird Laurier University (WLU)) provided a brief overview of the WLU-GNWT research partnership and emphasized the importance of research meeting the needs of northern communities. WLU opened a research office in Yellowknife in September 2017 to help facilitate these conversations. The office is largely supported through funding from the Global Water Futures project.

As WLU water-related research continues to expand throughout the NWT, there is a growing need to improve communication and knowledge sharing and to better align research with Water Strategy goals and water partners' needs. It is important for research to be action oriented, tied to end user needs, communicated and valued. WLU is looking for input on ways in which WLU can undertake research that makes sense to communities and other partners, is more effective, supports what communities are doing, and intersects and supports existing and developing programs. Specific questions include:

- How can we improve communication and mobilize knowledge channels?
- What kind of information do communities want and how do they want to access it?
- What is the best way for communities to access/approach academic partners?
- How do we create opportunities to network?
- How can we create and implement a plan to hand over responsibility and leadership of applicable research projects to communities?

Feedback on how to improve WLU connections with communities and water partners is encouraged.

### 3.2.3 Research Priorities – Breakout Group Discussions

The breakout group discussions provided an opportunity for water partners to review, discuss and refine the research priority survey results (see section 3.2.1) in greater detail. Water partners worked in three breakout groups, each with one facilitator and approximately 12 participants. A key objective of the breakout group activity was to work towards some consensus on refining specific Water Strategy research priorities. Discussion questions included:

- Are there any water-related research topics important to the Water Strategy that were not captured in the survey results?
- Are there any water-related research topics that emerged from the survey that are out of place?
- Are there specific research topics or questions that should be prioritized for the priority topics?

- What types of knowledge or information would need to be gathered to address these questions?
- Can the group prioritize the specific research topics or questions?

Key themes and concerns that emerged during the breakout groups included:

- All of the broad research topics are important and interrelated and thus cannot be treated as separate. One group compared the linkages to a lattice or a dream catcher, where all of the research topics are interrelated and thus require a holistic perspective to see the bigger picture.
- Water quality and climate change may appear to be the most important research topics, but they cannot be separated as they are inherently linked to one another and other research topics.
- Research priorities will vary by location and have to be considered separately, not grouped into a list of NWT-wide priorities.
- All of the broad topics can be researched in varying scales, spatially and temporally.
- While it may be straightforward for individual water partners to identify specific Water Strategy-related research topics (e.g., science-based research to better understand municipal sewage treatment, additional research to better understand the impacts of industrial development on aquatic ecosystems, groundwater research to learn more about variability and threats across the NWT, etc.), it may not be possible to meaningfully apply these to a territory-wide scale.

Overall, there was consensus among water partners that all of the identified broad Water Strategy research topics are important. However, it became clear that many water partners felt the process of ranking the broad research topics based on priority is too simplistic and does not accurately capture how water partners perceive research priorities. Reasons for this include:

- The process of identifying and separating research topics based on priority does not reflect holistic Indigenous worldviews founded on holistic observations and understandings of the world.
- Limiting research priorities to select topics does not account for the impacts of cumulative effects.
- Research priorities vary significantly by community and region and by temporal scale.
- Research priorities might change as new information becomes available and as perceived risks and concerns change.

Rather than setting Water Strategy-specific priorities, some water partners recommended focusing on ensuring that researchers are informed about appropriate collaborative research processes that would enable them to work with water partners, communities and other researchers to identify specific water research priorities at a community or project scale. Recognizing that the latter approach may be a more effective means to identify meaningful Water Strategy research priorities, water partners discussed different principles and approaches that should be built into such a research process.

### 3.3 Indigenous Storytelling Series

Four community members from different regions – Leon Andrew (Sahtu Secretariat Incorporated), Robyn McLeod (Dehcho First Nation), Robert Lamalice (Kátł'odeeche First Nation) and Richard Kochon (Behdzi Ahda First Nation) – participated in a one-hour storytelling series. The presenters shared different stories and perspectives that emphasized the importance of water to them and their communities, in addition to observations of change.

Leon Andrew spoke about growing up in Tulita and shared stories about Mother Earth that were passed on to him from his grandfather. In the early 1980s and 90s the Elders observed that the moon was not normal. Ever since then the weather has not been normal. Water was always important to the Chief, and people started to notice that there was a dust-like layer on the surface of the water that never used to be there. Overtime in the 1990s a lot of areas that used to be wetlands dried up and trees started dying. This is worrisome because people live off the river and land and. The Elders have also noticed changes in fish migration patterns.

Robert Lamalice talked about the significant changes he has observed on the land and in the way of life since the 1950s. In the past our Elders worked very hard and got together to share information. It is important that we are here together today to share information about water. The way our water and Mother Earth is being disrespected by industry today is sad, especially for the younger generations that will be left to deal with it. We are still land users that depend on the river and wildlife for food, transportation, culture and our well-being. It is important that we speak up about this and help each other. He expressed his desire to share stories and support people who want to learn and listen.

Richard Kochon spoke about the importance of being able to speak in his own language and shared stories from his grandfathers about making and setting willow nets to survive. First Nations people worked very hard to survive. Today we all need to work together and share ideas to survive. Richard was Chief of Colville Lake for 25 years and gained a lot of knowledge and experience about how we can work together and respect each other more. This is something that the Elders teach us, too – to help one another and accept help. The Elders don't just talk about these things, they have lived and experienced them. It is important that we don't take our way of life for granted – we need to work hard to protect our way of life.

Robyn McLeod provided a youth perspective to the series and spoke about growing up in Fort Providence and the importance of protecting land and culture. She shared some of her experiences participating in the Boreal Indigenous Guardians Program and leading a group of youth for three months on the land as part of the Tracking Change traditional knowledge research project. She

described her experience as an opportunity to reconnect with the land, Elders, her language and youth, and emphasized the importance of creating opportunities for other youth to do the same.

### 3.4 Dettah Cultural Walking Tour

Approximately 20 water partners participated in a cultural walking tour in Dettah. The tour was led by Bobby Drygeese (B Dene Adventures).

### 3.5 Panel: Water Licensing and Environmental Assessments

The Water Licensing and Environment Assessment panel was an interactive presentation involving the GNWT ENR Water Resources Regulatory Group (Nathen Richea), the Mackenzie Valley Land and Water Board (Heather Scott), and the Mackenzie Valley Environmental Impact Review Board (Brett Wheler). The presenters provided an overview of the NWT water regulatory system and demonstrated the process using a mock development proposal.

Under the *Mackenzie Valley Resource Management Act* there are four preliminary screening and permitting boards (Mackenzie Valley Land and Water Board, Gwich'in Land and Water Board, Sahtu Land and Water Board, Wek'èezhìı Land and Water Board) and one Environmental Assessment and Impact Review Board (the Mackenzie Valley Environmental Impact Review Board).

The mandate of the Land and Water Boards includes:

- providing for the conservation, development and utilization of land and water resources in a manner that will provide optimum benefit;
- considering the importance of conservation to well-being and way of life to Indigenous peoples of Canada; and
- considering both traditional knowledge and scientific information.

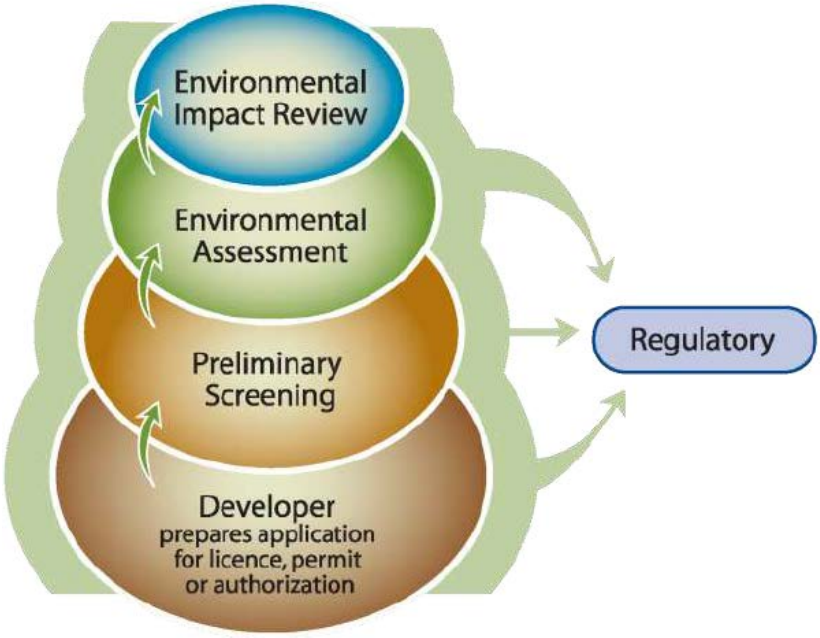
The roles of Land and Water Boards are to ensure decisions are made in accordance with approved Land Use Plans, conduct preliminary screenings and regulate the use of land and water and the deposit of waste.

The Mackenzie Valley Environmental Impact Review Board is a co-management board responsible for environmental assessments of projects with potential significant impacts or public concern. The Board is made up of six board members and one chairperson.

Figure 2 provides an overview of the Environmental Impact Assessment process. After a developer submits a complete development application, the application goes to preliminary screening. The preliminary screening involves a public review to determine if the proposed development might cause significant adverse impacts on the environment or be a public concern. The Boards host scoping and technical analysis sessions, workshops, and public hearings to gather information and concerns about the proposed development. If it is decided there may be cause for significant adverse impact, the application is referred to an environmental assessment. If there is not cause for significant adverse impact, the application proceeds to the regulatory phase for permitting and licensing. ENR is a participant in the regulatory process; however, the Minister of ENR is the

approver of water licenses. Once a license is issued, Water Resource Officers are required. All license holders are required to submit an annual report to the Land and Water Boards.

**Figure 2: Environmental Impact Assessment Overview**




## 3.6 Panel: Information Management and Data Sharing

### 3.6.1 Water Quality Monitoring Data Management, *Robin Staples, GNWT ENR*

Robin Staples (ENR) provided an overview of the LodeStar Environmental Database, which is one tool ENR is using to manage environmental data from historic and current monitoring and research projects. Information management is a key part of the Work Together component in both the Water Strategy and Action Plans. Information management is critical to ensuring our collective investment in research and monitoring is not lost or de-valued.

LodeStar is a data management system for processing analytical chemistry results and field data collected to characterize environmental site conditions (e.g., water chemistry, air, soil, sediment, and fish). It is an Oracle web-based application that allows any number of users to have access to any number of data on the system.

There are currently nine projects which have data stored in Lodestar. Each project has three to 50 sites, with hundreds of different parameters. These projects range from regional watershed

monitoring, transboundary rivers monitoring, research investigations, remediation projects, and permafrost monitoring.

A key feature of Lodestar is that it handles data from the sample collection phase through to validation and reporting. The system also supports public access to authorized data through GIS/web portal interfaces (e.g., Mackenzie DataStream).

Next steps include working to upload data from additional projects such as water survey sites and benthic and sediment monitoring on the Slave and Hay Rivers, undertaking additional snow survey and groundwater monitoring and improving reporting to data viewers such as DataStream.

### 3.6.2 Mackenzie DataStream – Management of Community-based Monitoring Program Data, *Carolyn DuBois, Gordon Foundation*

Carolyn DuBois (Gordon Foundation) provided brief background information and an overview of Mackenzie DataStream. Mackenzie DataStream is an independent and open-access platform for sharing water data. The foundation has invested substantially in water and the north, including through its Mackenzie River Basin Initiative. The intent is to raise the profile of the Basin, connect decision-makers with quality data, and support basin-wide collaboration.

Mackenzie DataStream currently hosts the data generated by the NWT-wide Community-based Water Quality Monitoring Program. The Gordon Foundation is working to scale the system up to include additional water quality data collected by other groups in the Mackenzie River Basin. New data sets are expected to be available online shortly.

The Gordon Foundation is committed to resourcing DataStream over the long-term, and is open to feedback and comments from users to improve the system. DataStream 2.0 will be launched later this week.

### 3.6.3 NWT Cumulative Impact Monitoring Program (CIMP), *Julian Kanigan, GNWT ENR*

Julian Kanigan (ENR) highlighted different areas to find high-level project results and data related to the NWT CIMP program (see section 2.4.3 for NWT CIMP program information). High-level project results are accessible through the CIMP Annual Reports which summarize annual project results, in addition to plain language bulletins and monitoring and research synthesis reports. These resources are available on the NWT CIMP website: nwtcimp.ca. Detailed NWT CIMP data are accessible through the NWT Discovery Portal (1140 reports), the Inventory of Landscape Change viewer (human and natural disturbance data) and Mackenzie DataStream (700 data records).

# 4.0 Appendices

## 4.1 Appendix A: Workshop Participants

| **Indigenous Governments and Community Members** | |
|---|---|
| Leon Andrew | Sahtu Secretariat Incorporated |
| Michael Birlea | Tłı̨chǫ Government |
| Rosy Bjornson | Deninu Kue First Nation |
| Angus Charlo | Yellowknives Dene First Nation |
| Jeffery Crapeau | Yellowknives Dene First Nation |
| Jeffery Fabian | Dehcho AAROM |
| Margo Flemming | Acho Dene Koe First Nation |
| Kathleen Fordy | Deninu Kue First Nation |
| Jonathan Goulet | Yellowknives Dene First Nation |
| Richard Kochon | Sahtu Secretariat Incorporated |
| Becky Kostka | Smith's Landing First Nation |
| David Krutko | Gwich'in Tribal Council |
| Robert Lamalice | Kátł'odeeche First Nation |
| Gordie Liske | Yellowknives Dene First Nation |
| Chad Martin | Yellowknives Dene First Nation |
| Robyn McLeod | Dehcho First Nation |
| Cochise Paulette | Smith's Landing First Nation |
| Phoebe Rabesca | Tłı̨chǫ Government |
| Peter Redvers | Kátł'odeeche First Nation |
| Shin Shiga | North Slave Métis Alliance |
| Melaine Simba | Ka'a'gee Tu First Nation |
| Dahti Tsetso | Dehcho First Nation |
| **Industry, Environmental Non-Government Organizations and Others** | |
| Adam Bathe | Slave River Coalition |
| Joseph Chamberland | C-Core |
| Anna Coles | Wilfrid Laurier University |
| Ryan Connon | Wilfrid Laurier University |
| Heather Crochetiere | WWF Canada |
| Vanessa Cunningham | Fisheries Joint Management Committee |
| Lindsay Day | Gordon Foundation |
| Carolyn DuBois | Gordon Foundation |
| Steve Ellis | Tides Canada |
| Sam Gargon | Keepers of the Water |
| Jenny Hickman | Wilfrid Laurier University |
| Alex Latta | Wilfird Laurier University |
| Barrett (Sonny) Lenoir | Ducks Unlimited Canada |
| Ben Linaker | Health Canada - Northern Region |
| Mike Low | Dehcho AAROM |
| Kelly Munkittrick | Wilfrid Laurier University |

| | |
|---|---|
| Sarah Rosolen | Aurora College/Aurora Research Institute |
| Heather Scott | Mackenzie Valley Land and Water Board |
| Chris Spencer | Government of Nunavut |
| Orla Tobin | Environment and Climate Change Canada |
| Brenda Van Hauvart | Ecology North |
| Brett Wheler | Mackenzie Valley Environmental Impact Review Board |
| Jasmina Vucic | Wilfrid Laurier University |
| Tracey Williams | The Nature Conservancy |
| **Government of the Northwest Territories** | |
| Jeanne Arsenault | Water Resources Division, ENR |
| Heather Beck | North Slave Region, ENR |
| Meghan Beveridge | Water Resources Division, ENR |
| Seth Bohnet | Water Resources Division, ENR |
| Blair Carter | Water Resources Division, ENR |
| Michele Culhane | Water Resources Division, ENR |
| Isabelle de-Grandpre | Water Resources Division, ENR |
| Nicole Dion | Water Resources Division, ENR |
| Scott Dowler | Water Resources Division, ENR |
| Stefan Goodman | Water Resources Division, ENR |
| Ryan Gregory | Water Resources Division, ENR |
| Greg Hamann | Municipal and Community Affairs |
| Bruce Hanna | Field Support Unit, ENR |
| Michelle Hannah | Environment Division, ENR |
| Robert Jenkins | Water Resources Division, ENR |
| Julian Kanigan | NWT Cumulative Impact Monitoring Program, ENR |
| Shawne Kokelj | Water Resources Division, ENR |
| Laura Krutko | Water Resources Division, ENR |
| Nahum Lee | Conservation, Assessment and Monitoring Division, ENR |
| Sonja Martin-Elson | Water Resources Division, ENR |
| Steve Schwarz | NWT Centre for Geomatics |
| Robin Staples | Water Resources Division, ENR |
| Tara Tompkins | Environment Division, ENR |
| Lindsay Vician | Water Resources Division, ENR |
| Peter Workman | Health and Social Services |

### 4.2 Appendix B: Workshop Agenda

# NWT Water Stewardship Strategy Implementation Workshop

## November 22-23, 2017

**Chief Drygeese Centre, Dettah**

NWT water partners[2] are invited to a two-day NWT Water Stewardship Strategy (Water Strategy) Implementation Workshop at the Chief Drygeese Centre in Dettah, NT. This annual workshop brings water partners together to review Water Strategy implementation activities and share information, knowledge and perspectives on water stewardship in the NWT.

**Workshop Objectives:**

- Provide opportunities for increased communication, knowledge sharing and relationship building among water partners.
- Water partners provide updates on Water Strategy implementation activities, including findings from aquatic ecosystem monitoring and research.
- Increase awareness of multiple knowledge systems and different research and monitoring approaches being used to inform water stewardship.
- Review and discuss outcomes of the 2016/2017 NWT Water Stewardship Strategy Progress Review Summary.
- Review proposed Water Strategy research priorities.

If you have any questions, please contact Blair Carter, Government of the Northwest Territories, Environment and Natural Resources (GNWT ENR):

Phone: 867-767-9234 ext. 53142 | Email: Blair_Carter@gov.nt.ca

[2] *Water partners are anyone with a role in water stewardship. This includes governments, Indigenous organizations, communities, regulatory boards, non-government organizations, industry and academia.*

# NWT Water Stewardship Strategy Implementation Workshop

**November 22-23, 2017**

**Chief Drygeese Centre, Dettah, NT**

## WEDNESDAY NOVEMBER 22, 2017

| | |
|---|---|
| **8:30 am** | **Bus leaves from Days Inn (Yellowknife)** |
| **9:00 am** | **Sign-In and Welcome** |
| **9:15 am** | **Opening Ceremony**, *Bobby Drygeese and Yellowknives Dene Drummers* |
| **9:25 am** | **Welcoming Remarks**, *Robert Jenkins, GNWT ENR*<br><br>**Agenda Overview**, *Michele Culhane, GNWT ENR* |
| **9:40 am** | **Aboriginal Steering Committee (ASC) Panel** |
| **10:15 am** | **2016-2017 Water Stewardship Strategy Progress Review,** *Blair Carter, GNWT ENR* |
| **10:45 am** | **Panel: Perspectives on Capacity Building, Leadership and Training**<br>• **Local and Distance Water Stewardship Learning Opportunities in the NWT,** *Sarah Rosolen, Aurora College/Aurora Research Institute*<br>• **NWT Water Education and Outreach**, *Brenda Van Hauvart, Ecology North*<br>• **On-the-land Water Education and Leadership Initiatives**, *Steve Ellis, Tides Canada*<br>• **Water and Wastewater Management Training Programs**, *Greg Hamann, GNWT Municipal and Community Affairs* |
| **12:00 pm** | *Lunch (Provided)* |
| **1:00 pm** | **Panel: Aquatic Ecosystem Monitoring and Research**<br>• **Community-based Water Quality Monitoring Program**, *Seth Bohnet, GNWT ENR*<br>• **Dehcho Aboriginal Aquatic Resources and Oceans Management (AAROM) Water Quality Monitoring Program**, *Mike Low, Dehcho AAROM*<br>• **Deninu Kue First Nation Aquatics Monitoring Program 2017,** *Rosy Bjornson and Kathleen Fordy, Deninu Kue First Nation*<br>• **Dehcho K'ehodi Stewardship Program**, *Dahti Tsetso, Dehcho First Nation* |

## 2:15 pm Panel: Aquatic Ecosystem Monitoring and Research (continued)

- **Global Water Futures Research Program,** *Anna Coles, Wilfrid Laurier University*
- **Long-term Water Quality Monitoring Network, NWT Update**, *Orla Tobin, Environment and Climate Change Canada*
- **NWT Cumulative Impact Monitoring Program (CIMP)**, *Julian Kanigan, GNWT ENR*
- **NWT Hydrometric Monitoring Network**, *Shawne Kokelj, GNWT ENR*
- **Update on Slave River and Delta and Great Slave Lake Community-Based Water Portal**, *Joseph Chamberland, C-CORE*
- **Wetland Stewardship**, *Barrett Lenoir, Ducks Unlimited Canada*

## 3:45 pm Water Stewardship Poster Fair and Photo Contest Display

### Poster Fair and One Minute Presentations

An opportunity to explore more specific research results and learn about additional Water Strategy implementation work underway in the NWT. Topics include:

- A collaborative wetland inventory project to advance wetland stewardship in the NWT, *Ducks Unlimited Canada*
- Celebrating NWT Water Resources: Public Outreach and Education, *Ecology North*
- Changing Hydrology in Baker Creek, *NWT CIMP*
- Circuit Rider Training Program, *Municipal and Community Affairs, Community Operations Division*
- Developing a Waste Management Strategy for the NWT, *GNWT ENR*
- Drops in the Bucket: How Aurora Research Institute is contributing to the Water Stewardship Strategy, *Aurora College*
- Ground Temperatures and Thermokarst in the North Slave Region, *NWT CIMP*
- How will Fish Communities in Gwich'in and Inuvialuit lakes Respond to Climate Change?*, Wilfrid Laurier University*
- Patterns of Fish Habitat Use and Migration in the Slave River System: Using Traditional, Local and Scientific Knowledge, *NWT CIMP*
- Stable Isotope Analysis of Mercury in Fish of the Slave River Delta Region, *NWT CIMP*
- Understanding and Predicting Fish Mercury Levels in the Dehcho Region, *NWT CIMP*
- Zooplankton Communities and Water Quality in the Mackenzie Delta Area lakes, *Wilfrid Laurier* University

### Photo Contest Display

Browse the collection of photos submitted by youth across the NWT telling us why they **#loveNWTwater.**

**Take a ballot and vote on the photo submissions to determine prize winners!**

## THURSDAY NOVEMBER 23, 2017

| | |
|---|---|
| **9:30 am** | **Bus leaves from Days Inn (Yellowknife)** |
| **9:00 am** | **Sign-In and Cultural Tour Registration** |
| **9:10 am** | **Day Two Agenda Overview** |
| **9:15 am** | **Transboundary Water Management Agreements Update**, *Robert Jenkins, GNWT ENR* |
| **9:45 am** | **Water Strategy Research Priorities**<br>• **Overview of Water Strategy Research Priorities Survey Results**, *Blair Carter, GNWT ENR*<br>• **Strengthening Linkages Between Laurier's Research Plan and Community Information Needs**, *Dr. Kelly Munkittrick, Cold Regions and Water Initiatives, Wilfrid Laurier University* |
| **10:15 am** | **Break-Out Sessions: Water Strategy Research Priorities Survey Results** |
| **11:15 am** | **Storytelling Series** |
| **12:00 pm** | *Lunch (Provided)* |
| **1:00 pm** | **Dettah Cultural Walking Tour** |
| **1:45 pm** | **Panel: Water Licensing and Environmental Assessments**<br>Discussion on roles and responsibilities, multiple knowledge systems and Action Item updates.<br>• **GNWT ENR Water Resources Regulatory**, *Nathen Richea, GNWT ENR*<br>• **Mackenzie Valley Land and Water Board**, *Heather Scott*<br>• **Mackenzie Valley Environmental Impact Review Board**, *Brett Wheeler* |
| **2:45 pm** | **Panel: Information Management and Data Sharing**<br>• **Mackenzie Datastream – Management of Community-based Monitoring Program Data**, *Carolyn DuBois, Gordon Foundation*<br>• **NWT Cumulative Impact Monitoring Program (CIMP)**, *Julian Kanigan, GNWT ENR*<br>• **Water Quality Monitoring Data Management**, *Robin Staples, GNWT ENR* |
| **3:45 pm** | **Break-Out Session Summary and Closing Remarks**, *Robert Jenkins, GNWT ENR*<br><br>**Closing Ceremony**, *Yellowknives Dene Drummers* |