Indian and Northern Affairs Canada
Affaires indiennes et du Nord Canada

Water Quality and Quantity in the NWT

WaterToday

Water is life

The Northwest Territories (NWT) has an abundance of freshwater. This water is essential to ecosystem health, as well as to the social, cultural and economic well-being of territorial residents. Northernersrelyonwaterforsustenance, recreation, and transportation. Major water uses in the NWT include municipal consumption, industrial development, such as mining, oil and gas and hydroelectric power production. For Aboriginal people, who make up approximately 48% of the territory's population, water has intrinsic cultural, spiritual, and historical value. Water is considered by many Aboriginal people to be a heart – giving life to people, wildlife, fish and plants.

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In recent years, Northerners have been paying more attention to the state of our water quality and quantity. With increasing water resource pressures on a regional, national and international level, residents are recognizing that actions need to be taken now to ensure our water resources are sustained for future generations. Environmental monitoring and research activities provide a foundation for making sound decisions about water resources in the NWT.

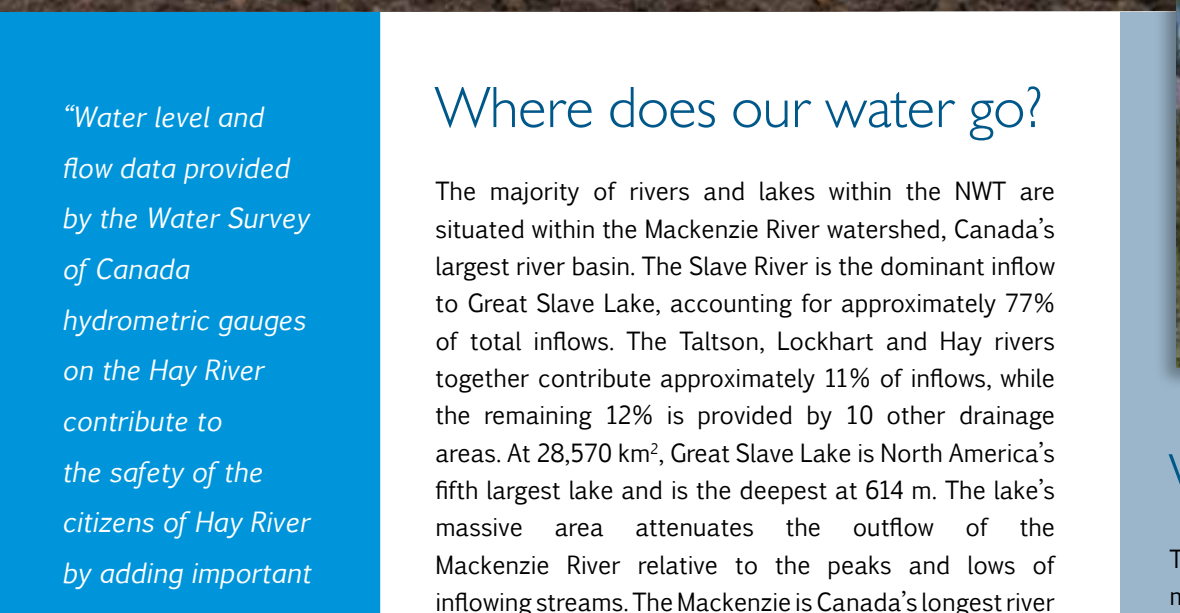


Photo: D. Sauchyn

"Water level and flow data provided by the Water Survey of Canada hydrometric gauges on the Hay River contribute to the safety of the citizens of Hay River by adding important information to the collaborative effort of the University of Alberta, Town of Hay River, Katl'odeeche First Nation and INAC in developing an ice-jam flood forecasting system for the Town of Hay River. I look forward to our continued collaboration."

Mike Maher
Town Councillor/Deputy Mayor,
Town of Hay River

Where does our water go?

The majority of rivers and lakes within the NWT are situated within the Mackenzie River watershed, Canada's largest river basin. The Slave River is the dominant inflow to Great Slave Lake, accounting for approximately 77% of total inflows. The Taltson, Lockhart and Hay rivers together contribute approximately 11% of inflows, while the remaining 12% is provided by 10 other drainage areas. At 28,570 km^2, Great Slave Lake is North America's fifth largest lake and is the deepest at 614 m. The lake's massive area attenuates the outflow of the Mackenzie River relative to the peaks and lows of inflowing streams. The Mackenzie is Canada's longest river at 1802 km in length and flows northwest from Great Slave Lake through the NWT to the Beaufort Sea. It is an important transportation corridor for the communities situated in the Mackenzie Valley. Great Bear Lake is the largest freshwater lake located entirely within Canada and provides a significant moderating effect on Great Bear River which flows into the Mackenzie River. The Mackenzie Delta is the world's second largest arctic delta and provides habitat for many fish, mammal and bird species. North America's largest freshwater discharge to the Arctic Ocean flows through the Mackenzie Delta.

There are many other major rivers within the Mackenzie River basin including the Liard and Peel rivers, as well as countless smaller rivers, lakes and wetlands. Outside of the Mackenzie River basin, the headwaters of many important rivers lay within the NWT. The Kazan, Dubawnt, Thelon, Back and Coppermine rivers all flow from the NWT into Nunavut, while the Anderson, Horton and Hornaday rivers flow directly into the Beaufort Sea.

What affects water?

There are many factors that can affect water quality and quantity; the two most significant being development and climate change.

Mining, petroleum exploration and production, hydro-electricity and municipal uses can have direct impacts on our water; impacts that increase with population growth and further economic development activities. Additionally, industrial operations in other jurisdictions can affect waters which flow into the NWT (e.g. Alberta Oil Sands and WAC Bennett Dam in British Columbia). Airborne pollutants can be transported from far away sources, which can also impact territorial water quality. Monitoring programs that target areas of particular concern in the NWT are necessary to understand and address how our water resources are being affected.

Both climatic fluctuations and climate change can affect water resources. We are all familiar with seasonal changes and year-to-year variations which occur in weather variables such as air temperature and precipitation. A significant amount is known about how these short-term variations affect water, however there is much less certainty about how long-term climate change has and will continue to impact water resources in the NWT. Given the territory's incredibly diverse landscape, it is important to recognize that different areas may reflect changes in different ways. It will be important for communities, government, industry and other organizations to communicate effectively to ensure the appropriate questions are being asked and to be strategic about gathering relevant information from the right places.

Canada

"In Nahanni National Park Reserve, water quality has long been an important aspect of park management. Along with our cooperative management partners, the Dehcho First Nations, Parks Canada has identified maintaining water quality as a key issue in the park management planning process, and water quality therefore has a central place in the park's ecological monitoring program. In fact, freshwater is one of five major ecological indicators used in our recently completed State of the Park Report to assess the condition of the park, and both water quality and quantity are part of this assessment."

Douglas P. Tate, M.Sc.
Conservation Biologist, Nahanni National Park Reserve
Parks Canada

Photo: INAC

Why monitor water?

In order for Northerners to make informed decisions about how water in the NWT is used and managed, we need to have as much information available as possible. For this reason, monitoring initiatives for water quality and quantity in the North are important because they increase our overall understanding of the environment and guide decision-making processes.

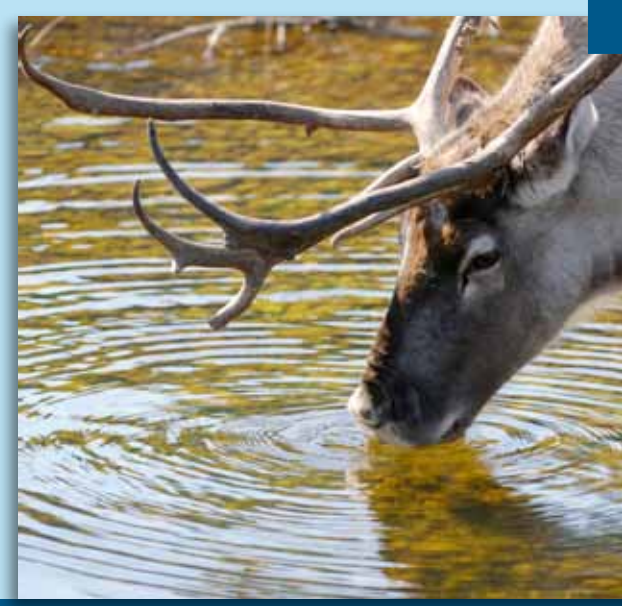
Water monitoring activities include the collection, analysis, interpretation and distribution of water quality and quantity information. The information gathered at monitoring stations across the NWT is often referred to as baseline data. It is used to examine the past and present state of water. Each additional year of new baseline data collected increases our ability to understand the present and to forecast future environmental conditions.

Baseline data also allow us to monitor cumulative impacts, set thresholds and develop mitigation measures for various water users. Cumulative impacts are changes to the biophysical, social, economic, and cultural environments caused by past, present and reasonably foreseeable actions. Knowing the current state of water and projected water uses helps us to detect and evaluate trends. It also allows us to predict the impact of future development activities on our water resources. This predictive ability enables us to respond more effectively and in a timely manner to potential and actual environmental changes in the NWT, and is essential to maintaining the integrity of northern waters.

The use of traditional knowledge is a holistic way of understanding the land and can contribute to a more complete understanding of how the environment works.

Climate change affects water quality and quantity in a variety of ways, such as changes in precipitation patterns, timing and duration of ice on/off periods, and slumping associated with permafrost melting and ground subsidence. Monitoring water quality and quantity allows us to determine the effects of these changes.

Photo: INAC



Why measure water quantity?

1) For improved understanding.
We want to know how much water there is. INAC and EC measure water quantity across the North. This includes a data collection program in the NWT, which is important both regionally and nationally in evaluating the state of one of our most significant natural resources.

2) For informed transboundary negotiations.
The Bennett Dam in B.C. affects the flow of the Slave River. Other major rivers flowing across the NWT border are also measured to determine the effects of upstream developments. Transboundary rivers with gauging stations include the Peel, Liard, Hay, Coppermine, Thelon and Back rivers.

3) For river traffic.
Transportation companies plan their barge trips when water levels are high enough to get over the shoals and sand bars.

4) For safe ferry operations.
Warning of high water levels and flows at ferry crossings can be provided.

5) For river crossings.
Design of safe bridges and culverts on roads depends on expected flows at river crossings. Pipeline stream crossings also require this type of data.

6) For design of water holding structures.
Sewage lagoons at communities and tailings ponds at mine sites must be designed to hold natural runoff. These amounts are estimated from water flow measurements.

7) For flood monitoring.
Water level and flow information is used during spring break-up of the rivers in the communities of Hay River, Fort Liard, Fort Simpson, Tulita, Norman Wells and Aklavik to give early warning of flooding.

8) For recreation.
Canoeists and rafters on the rivers want to know water levels and flows for safety reasons.

9) For assessing developmental impacts.
The collection of baseline data allows us to see how changes in water usage impacts our resources.

Who does what?


Photo: INAC

All Northerners have a responsibility to care for the land and water. In the NWT, a number of organizations play leadership roles in carrying out this shared responsibility, called "environmental stewardship". These include Aboriginal governments, the territorial and federal governments, co-management resource boards, regulatory boards, environmental non-governmental organizations, communities and industry.

Together, these organizations developed the NWT Environmental Stewardship Framework (ESF) which supports responsible economic development within the context of sound environmental stewardship. The ESF is a 'toolkit' of interlinked programs, policies and legislation intended to allow development to proceed sustainably, with minimal environmental harm and maximum benefit to territorial residents. One of the components of the framework is "Baseline Studies and Long-term Monitoring" which highlights the significance of having relevant long-term baseline information for making responsible environmental decisions.

Water monitoring activities have been conducted in the NWT by governments, communities, industry and other parties for many years. This historical information provides a window to the past and helps us understand our current environmental conditions. We have long-term, continuous data from some monitoring programs that go back 50 to 60 years. Other programs offer data sets that capture a snapshot in time. Today, policies and programs are in place or are being developed that formalize the need for the continued collection of this valuable water-related information. Given the diversity, size and remoteness of our territorial landscape, these policies will help to ensure that efforts are coordinated, programs are focused, common methods for comparison and interpretation are used and venues to share information are accessible. Collectively, we can work towards a better understanding and management of this essential resource – our water.

INAC, the Government of the Northwest Territories and Aboriginal governments have partnered to develop the NWT Water Stewardship Strategy, a made-in-the-North plan that establishes a vision for the future of our water resources. The Strategy outlines a number of monitoring and research initiatives that will contribute to our overall environmental knowledge. The Strategy sets out a framework that will facilitate sound water management decisions based on both western science and traditional knowledge, allow for effective evaluation of past decisions and provide the ability to change management practices as required.

While researchers in cooperation with community members are carrying out field studies to assess current trends in the environment, Aboriginal elders are using traditional knowledge to provide a historical context about weather, land, plants and animals and how these have changed over time. Integrating western science with traditional knowledge is key to reaching a better understanding of our northern environment. There are a number of community-based monitoring programs underway throughout the territory.

Regulatory boards play an important role in managing our water resources. Relying on the data provided by other parties and lessons learned through previous experience, these boards are responsible for evaluating development proposals to determine any potential impacts on land and water. If a type A water licence is issued by a board, there is a requirement for some form of monitoring program. As projects proceed, monitoring programs show whether impacts are occurring as predicted, and whether the steps used to mitigate them are working as anticipated. Sometimes mitigation measures may need to be adjusted, requiring a water licence, land use permit or environmental agreement to be modified. Monitoring programs provide the information necessary to respond and make these types of decisions in an efficient manner. Scientists, governments, Aboriginal groups, industry and non-government organizations have a veste d interest in ensuring any cumulative effects of development are closely monitored.

Environmental agreements signed by diamond mines set out requirements for monitoring programs, environmental management and closure and reclamation plans. Each agreement establishes a monitoring agency, funded primarily by industry. Aboriginal governments play a fundamental role in these agencies that provide advice to the company, communities and government agencies on environmental issues related to the project.


Photo: INAC

Why measure water quality?

1) To know that our water is safe to drink.
Water quality is affected by a variety of activities, including various industrial developments, municipalities and recreational users. Therefore, it is necessary to measure water quality to determine if it remains safe for consumption.

2) To be able to eat fish from our lakes and rivers.
Altered water quality can affect aquatic life, including fish habitat. It is important to measure water quality to ensure that fish (a major food source for people and animals) can thrive in our waters.

3) To contribute to the existing knowledge about water quality in order to track changes over time.
It is important to have consistent, long-term data about water quality that will allow us to evaluate how water quality has changed (e.g. as a result of development or climate change).

4) To address community concerns about contaminants in water and suspended sediment.
Communicating information about water quality is an important component of measuring and monitoring. A priority of measuring water quality is to inform community members about the state of this essential resource.

5) To support the development of water quality objectives for transboundary water agreements.


Photo: INAC


Photo: INAC


Photo: INAC

What about transboundary waters?

Water in the NWT is affected by activities in other jurisdictions – the flow of water through rivers and lakes simply does not recognize borders between provinces and territories. As the authority responsible for water resources management pursuant to the *NWT Waters Act*, INAC participated in the negotiation of a formal agreement on transboundary waters with its neighbours. The Master Agreement on managing transboundary waters in the Mackenzie River Basin was signed by Alberta, Saskatchewan, British Columbia, Yukon, Northwest Territories and Canada in 1996. This agreement requires provinces and territories to negotiate the specific details of how transboundary waters will be monitored and managed in each jurisdiction through bi-lateral or potentially multi-lateral agreements.

Examples of Water Monitoring Programs at Work

Peel River Water and Suspended Sediment Sampling Program

What sampling has been conducted?

The Peel River water sampling site has been operated by EC as part of its water quality network since 1969. EC routinely collects surface water samples four times a year. INAC sampled water and suspended sediment at the same site from 2002-2007. INAC will perform follow-up water and suspended sediment sampling in 2012.

Why is collecting specifc data important?

Water quality and sediment samples were collected to learn more about the water and suspended sediment in the river; increase existing knowledge about water quality in order to track changes over time; address community concerns about contaminants in the water and suspended sediment; and support the development of water quality objectives for the Yukon-NWT Bilateral Waters Agreement.

How will this information be used?

Information collected about the Peel River will: improve our understanding of water and suspended sediment quality in this important northern watershed; be considered in environmental land use planning initiatives; help to develop site-specific transboundary water quality objectives for the Yukon-NWT Bilateral Waters Agreement; and assist in detecting changes in water quality resulting from human disturbance and/or natural phenomena.

What are the most recent results?

Water in the Peel River is generally of excellent quality. Water quality in the river upstream from Fort McPherson reflects the local and seasonal environmental conditions. Recent sampling shows that the water is safe for drinking (after boiling for five minutes), swimming and aquatic life.

Hay River Ice Jam Flood Forecasting

The Hay River is prone to severe ice-jamming and consequent flooding during spring break-up. For the Town of Hay River, this often results in considerable damage, loss of property and risk to human lives. The town has become one of the most proactive Canadian communities for ice jam release detection. In addition to the stations operated by Water Survey of Canada, the Town of Hay River operates a remote water level monitoring network. For the past six years, researchers from the University of Alberta (U of A) and INAC staff have been on-site to observe and study the Hay River break-up, including record ice jam and ice run events.

What monitoring has been conducted?

Monitoring on the Hay River includes:

- Year-round continuous water level and flow are monitored on the Hay River just south of Hay River township (and some contributing rivers in Alberta) (INAC, EC);
- Water levels at several sites on Hay River during the spring break-up period (Town of Hay River);
- A number of environmental variables such as solar data (INAC); ice thickness (U of A, INAC, Town of Hay River); snow depth (INAC, Town of Hay River); ice profiling (U of A, INAC); river bathymetry (U of A, INAC); meteorological data (EC); and
- Ice movement and break-up observations (Town of Hay River, U of A, INAC).

Extensive local knowledge of the river and its break-up behaviour, historical reports and information have also been shared by the K'atl'odeeche First Nation and citizens of the Town of Hay River.


Photo: NTPC

"Hydrologists and scientists use monitoring information to better understand the hydrologic cycle and to predict low water periods. This allows hydro facility operators to implement effective water management practices to plan and implement actions to compensate for low flows in the watershed. Water quantity measurements provided by Water Survey of Canada enable the NT Hydro Group of Companies to manage water flows throughout its system to ensure the most effective form of power production."

Dan Grabke
Director, Business Development
NT Energy Corporation (03) Ltd.

The Master Agreement also set up a unique management body – the Mackenzie River Basin Board (MRBB). Federal, territorial and provincial government agencies sit on this board and have a mandate to facilitate transboundary water agreements and monitor the overall state of the aquatic environment in the Mackenzie Basin. The MRBB compiles monitoring results every five years to detect and evaluate trends or impacts on northern waterways – this *State of the Aquatic Ecosystem Report* is considered an "ecosystem check-up".

The MRBB is focusing its attention on ways to increase Aboriginal involvement and how to enhance the use of traditional knowledge in all its activities. Traditional knowledge generally refers to the long-standing traditions and practices of local communities. It encompasses the values, wisdom, knowledge and teachings of these communities, and in many cases has been passed on for generations from person to person. A working group has been formed with the purpose of providing direction to the MRBB on this subject. This group is compiling an inventory of traditional knowledge that relates to oil sands, hydro-electric projects and climate change. Information collected will ultimately contribute to the board's *State of the Aquatic Ecosystem Report.*

Why is collecting specific data important?

Short and long-term data is used to forecast the events that will likely occur as the snow and river ice upstream melts and moves toward the mouth of the Hay River at Great Slave Lake. Computerized prediction models of break-up are being developed to forecast and assess ice jam flood risk at the Town of Hay River.

How will this information be used?

U of A researchers and INAC hope to provide local communities with a tool to prepare for the severity of break-up and the risks associated with potential flooding that might occur. It is hoped that local governments and organizations will be able to anticipate spring break-up conditions, contributing to increased community safety and decreased property damage. This is an example of how collaborative efforts by multiple parties can have a positive long-term impact for residents of local communities.

Marian Lake Watershed Monitoring and Management Program

The long-term objective of the Marian Lake Watershed Monitoring and Management Program is to implement an integrated environmental monitoring program that will assist the Wek'èezhìi Forum in making management decisions. The Wek'èezhìi Forum is comprised of representatives from the: Tłı̨chǫ Lands Protection Department, Wek'èezhìi Renewable Resources Board and Wek'èezhìi Land and Water Board. The program will also help make regional information accessible to other government agencies, Tłı̨chǫ communities, educational institutions and other parties.

A fish monitoring project is one component of the overall monitoring program for the entire watershed. Since the health of fish species is an indication of water quality, this monitoring program will contribute to the evaluation of regional water quality. Once the framework for this project is in place, additional monitoring programs will be designed using relevant criteria for specific participants and implemented in different locations.

Who is involved?

Based on initial interest, it is anticipated that members from the federal government, territorial government, and industry will join the working group, currently made up of Wek'èezhìi Forum representatives.

What will be monitored?

A key component of the program will involve the input and participation of communities, particularly elders and students. Community participants will help to identify the Valued Ecological Components (VCs) that local residents would like to see monitored, as well as preferred locations for monitoring sites. Traditional knowledge will be central to the program framework.

How will the information be used?

Ultimately, the program will enable the Wek'èezhìi Forum to collect sufficient data and integrate it with other relevant datasets to assess cumulative impacts at a regional scale for the Marian Lake watershed.

Through the program, the Wek'èezhìi Forum will be able to coordinate other community-based monitoring activities and provide standard monitoring and education protocols for the entire region that will contribute to the overall monitoring of northern waters.

Will the data be available?

Data that are collected through this program and other related programs will be merged, synthesized and shared with government agencies, industry, researchers and the general public.

"Long term continuous data are required to properly design engineering structures, including pipelines, tailings ponds, dams, drinking water access points, culverts, and bridges. These datasets are uncommon in the Northwest Territories, especially for smaller watersheds, increasing uncertainty. This increases construction costs and risk to property, the environment and human life. Variation due to climate and landscape change make what data exist even more valuable to estimating streamflow."

Chris Spence
Research Scientist, Hydrological Process and Modeling Research
Environment Canada

Photo: INAC

Examples of Water Monitoring Programs at Work

Municipal Wastewater Effluent Monitoring

What is wastewater effluent?

Wastewater is the liquid from a home, community or industry that contains dissolved or suspended matter. Wastewater effluent is treated or untreated fluid that flows out of a treatment plant, sewer or industrial pipe and is generally discharged into rivers or lakes. Municipal wastewater effluent is one of the largest sources of pollution, by volume, discharged to surface water bodies in Canada. Reducing the discharge of pollution through wastewater effluents requires a number of steps, ranging from source control to end-of-pipe measures.

Is wastewater effluent being monitored in the NWT?

In November 2003, the Canadian Council of Ministers of the Environment (CCME) agreed to develop the Canada-wide Strategy for the Management of Municipal Wastewater Effluent. The goal is to achieve secondary level treatment and to develop discharge objectives and monitoring programs for wastewater systems.

Photo: GNWT-DOT

"The safe operation of ferries in the Northwest Territories is assisted by utilizing daily water depth information at each of our river crossings."

Glenn May
Assistant Director, Marine Services
Department of Transportation, GNWT

In February 2007, EC and INAC formed the Northern Research Working Group to plan for and implement the actions necessary to develop appropriate recommendations to address the unique conditions of northern Canada. The working group's mandate is to facilitate further understanding of municipal wastewater effluent and site conditions in the North. The working group assists jurisdictions by providing a communications forum and technical expertise on northern municipal wastewater effluent issues, as well as by working with communities on the importance of sampling and reporting of wastewater effluent. A sampling program was initiated in the summer of 2007 and continued in 2008 and 2009 to collect wastewater samples and information on wastewater treatment systems in communities in the North.

What were the findings?

Twenty-three communities in the NWT were sampled. Parameters such as total suspended sediment (TSS), carbonaceous biological oxygyen demand (CBOD), total organic carbon (TOC), pH, fecal coliforms, nitrite, sulphate, fluoride, arsenic, cadmium, cobalt, copper, lead, molybdenum, nickel, selenium, zinc and chromium were found at higher levels than the selected comparative guideline value in some communities. These parameters need to be considered on a site-specific basis for each community to determine the cause and effect of exceeding the comparative guideline value. The working group has produced a report of the findings and has made recommendations on further sampling procedures for data collection. The report is available by contacting the Mackenzie Valley Land and Water Board.

What will be done with this information?

Currently, the direction of the Northern Research Working Group is to work with other groups to further evaluate the specific wastewater effluent treatment needs of northern communities and the type of treatment solutions that can be implemented. In addition, other scientific and technical work remains to be completed to ensure effective Strategy implementation in the North, keeping in mind unique northern conditions.

Aquatic Effects Monitoring Program Guidelines

What is an Aquatic Effects Monitoring Program (AEMP)?

An Aquatic Effects Monitoring Program (AEMP) is a program created by a developer to measure and monitor the effects of a specific development project (e.g. mine, oil and gas facility or hydro development) on the aquatic ecosystem or water environment. In the NWT, AEMPs are generally a requirement of Type A water licences which are issued by regulatory boards such as the Mackenzie Valley Land and Water Board or other regional panels. Water licences set the limits and rules that must be followed by a developer, as per the *NWT Waters Act* and *Mackenzie Valley Resource Management Act* which govern the use of water and deposit of waste. AEMPs provide an early warning of potentially negative effects resulting from a development project. This early warning system is used to manage the project to reduce effects on the aquatic ecosystem.

Where can I find data and more information?

Aquatic Effects Monitoring Program

Indian and Northern Affairs Canada
www.inac-ainc.gc.ca/ai/scr/nt/ntr/pubs/index-eng.asp

Canadian Aquatic Biomonitoring Network (CABIN)
www.ec.gc.ca/rcba-cabin

Cumulative Impact Monitoring Program

www.nwtcimp.ca

Drinking Water

Municipal and Community Affairs, GNWT
www.maca.gov.nt.ca/operations/water/homepage.asp

Health and Social Services, GNWT
www.hlthss.gov.nt.ca/english/services/environmental_health/default.htm

Health Canada
www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/index-eng.php

Indian and Northern Affairs Canada
www.ainc-inac.gc.ca/ai/scr/nt/env/wr/index-eng.asp

Fish Habitat

Fisheries and Oceans Canada
www.dfo-mpo.gc.ca/regions/central/index-eng.htm

Impact Review Boards

Mackenzie Valley Review Board
www.reviewboard.ca

Environmental Impact Review Board
www.eirb.ca

Land and Water Boards

Northwest Territories Water Board - www.nwtwb.com

Mackenzie Valley Land and Water Board - www.mvlwb.com

Gwich'in Land and Water Board - www.glwb.com

Sahtu Land and Water Board - www.slwb.com

Wek'èezhìi Land and Water Board - www.wlwb.ca

What are AEMP Guidelines? Why is collecting data important?

The AEMP Guidelines were designed to ensure the unique and sensitive aquatic ecosystem of the NWT is protected. These guidelines were released in June 2009 and present an eight-step process for designing, documenting, implementing and interpreting AEMPs. An AEMP provides an effective basis for determining if sensitive northern aquatic ecosystems are being protected during the construction, operation, and closure and reclamation phases of development projects in the NWT.

AEMP Guidelines are needed to provide clarity and consistency in monitoring the aquatic ecosystem surrounding a development project. This will result in an AEMP that meets the expectations of the regulatory board and interested parties. Monitoring data and observations that are comparable between development projects can ultimately assist in the study of cumulative effects from multiple development projects.

What monitoring is conducted?

Data and observations on the physical, chemical and biological conditions of aquatic ecosystems (both traditional knowledge and western science based) are required to support water resources management and to track potential effects of a development on the aquatic ecosystem. Water quality, sediment quality, water quantity, along with fish and aquatic organisms such as zooplankton and benthic invertebrates generally form the core of the variables monitored as part of AEMPs.

Where are the data found?

AEMP data are available on the regulatory boards' public registries (websites and/or offices).

Contact INAC's Water Resources Division in Yellowknife for more information at 867-669-2655.

Photo: D.Sauchyn

How will the information be used?

CIMP will make data available for interpretation; report on the health of the environment including biophysical, social and economic components; support better decision-making with regards to environmental protection; and help coordinate monitoring and reporting in the NWT.

What monitoring has been conducted?

Pilot projects are currently underway in the Mackenzie Delta. This program has been developed by the CIMP Working Group, a partnership between Aboriginal governments, the Government of Canada and the Government of the Northwest Territories. The goal of the work in the Delta is to engage community monitors and youth in scientific data collection, and to provide a voice to traditional knowledge that expresses Inuvialuit views about the local environment and its changes. Building on project results and lessons learned, it is hoped that similar community monitoring programs will be developed in other regions of the NWT.

What will be done with the data collected?

CIMP is working with partners to develop databases that will make data available to the public and encourages the contribution of data to existing databases. As a result, data will be available for numerous analyses, including the assessment of cumulative effects. CIMP reports are available online (www.nwtcimp.ca) and the results of work in the Mackenzie Delta region were published in Permafrost and Periglacial Processes, volume 20, #2, April-June 2009.

NWT Cumulative Impact Monitoring Program

The NWT Cumulative Impact Monitoring Program (CIMP), which is set out in land claim agreements and the *Mackenzie Valley Resource Management Act,* requires governments to collect information on how all uses of land and water, including deposits of waste, affect the NWT environment. CIMP focuses on cumulative impacts, while encouraging community-based monitoring and community capacity-building in the environmental field. The program supports the use of both scientific and traditional knowledge to build a holistic understanding of the land. CIMP promotes the use of various common protocols (e.g. Canadian Aquatic Biomonitoring Network (CABIN)) which will enhance the network of information on aquatic systems. CIMP also provides resources to fill the gaps in current monitoring activities.

NWT Environmental Stewardship Framework

www.ceamf.ca

NWT Water Stewardship Strategy

Environment and Natural Resources, GNWT/Indian and Northern Affairs Canada
http://www.enr.gov.nt.ca/_live/pages/wpPages/water.aspx

NWT Water Quality and Quantity

Indian and Northern Affairs Canada
www.ainc-inac.gc.ca/ai/scr/nt/env/wr/index-eng.asp

Environment Canada
www.wsc.ec.gc.ca/menus/main_e.cfm?cname=regions_e.cfm

Mackenzie River Basin Board

www.mrbb.ca

Snow Surveys

Indian and Northern Affairs Canada
www.ainc-inac.gc.ca/ai/scr/nt/env/wr/dt/ss/index-eng.asp

Environment Canada
www.climate.weatheroffice.ec.gc.ca/Welcome_e.html

Wastewater Effluent

Environment Canada
www.ec.gc.ca/eu-ww/default.asp?lang=En&n=BC799641-1

Water Survey of Canada

Environment Canada
www.wsc.ec.gc.ca/index_e.cfm?cname=main_e.cfm

For more contact information see back page.

Frequently Asked Questions

Where can I get water quality and water quantity data?

INAC and EC cost-share the operation of the NWT portion of the National Hydrometric Network (see map for station locations). This network is operated by the Water Survey Division of EC. Stream flows and lake levels are measured continuously. Historic data are published annually and are available from Water Survey of Canada's National Water Quantity Survey Program website at www.wsc.ec.gc.ca/products/main_e.cfm?cname=products_e.cfm. This site also includes real-time hydrometric data for many stations.

INAC and EC both have a series of water quality monitoring sites across the NWT (see map for sampling locations). Some INAC data can be downloaded at www.ainc-inac.gc.ca/ai/scr/nt/ntr/pubs/index-eng.asp. Alternatively, water quality and quantity data are available by contacting INAC or EC directly. See contact info below.

How do I find out about drinking water quality in my community?

The Government of the Northwest Territories' Department of Municipal and Community Affairs maintains a publically accessible water quality database which can be queried by community or hamlet at www.maca.gov.nt.ca/operations/water/waterQ_Main_MenusQL.asp.

Other potential contacts include: Northwest Territories Water Board, Mackenzie Valley Land and Water Board, Gwich'in Land and Water Board, Sahtu Land and Water Board and Wek'èezhìi Land and Water Board.

If drinking water comes directly from a local lake, you can contact the following organizations to see if there are any health advisories in effect:

- Health and Social Services, Government of the Northwest Territories
- Water Quality and Health Bureau, Health Canada
- Water Resources Division, Indian and Northern Affairs Canada

Where can I find out if there has been more or less snow than normal this year?

INAC measures the volume of snow at the end of the season (April) at approximately 45 different survey sites. The volume of snow from one year to the next is compared by converting the amount of snow to a "snow-water equivalent" – the amount of water produced per unit of area if the snow was melted. This takes into consideration the depth of snow and its density. Historic snow quantity data can be viewed online or downloaded at www.ainc-inac.gc.ca/ai/scr/nt/env/wr/dt/ss/index-eng.asp.

EC also measures snow depth and volume at 15 community-based locations in the NWT. These measurements are made at monthly intervals throughout the winter period, and the data are included in the "Canadian Climate Normals" database available online at www.climate.weatheroffice.ec.gc.ca/Welcome_e.html.

It has been raining a lot in Yellowknife during summer months. Is that why Great Slave Lake water level is high?

The water level of Great Slave Lake is primarily influenced by the Slave River, which flows into the south end of the lake at Fort Resolution (Deninu Kué). The Slave River begins in northern Alberta at the confluence of the Peace River and the three main channels draining the Peace-Athabasca Delta/Lake Athabasca. The Peace River and headwater tributaries originate in north eastern British Columbia and contribute the majority of total annual flow into the Slave River (~66%). The Slave River in turn contributes more than 75% of the total annual inputs to the lake. In general, it is the combination of flows from the Peace River, the Peace-Athabasca Delta and Lake Athabasca that determine the Slave River flows and ultimately the water level on Great Slave Lake.

When is a water licence needed?

A water licence is needed if a proposed undertaking requires the use of water or the deposit of waste. *The NWT Waters Act* and NWT Water Regulations specify the thresholds for water use that would require a licence and indicate the type of water licence necessary for the deposit of waste. Licences are issued by land and water boards in the NWT.

Indian and Northern Affairs Canada is the authority responsible for water resources management pursuant to the NWT Waters Act, and therefore has an important role to play in maintaining the integrity of northern waters.

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Environment Canada in the Northwest Territories collects, processes, publishes and distributes surface water quantity data and information on a national basis through the authority of the *Canada Water Act*, formal agreements with Indian and Northern Affairs Canada, other government departments and the private sector. Costs are shared according to specific interests and needs.

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