CONNECTIONS

Newsletter | May 2024

Photo taken at Cross Lake

Contents

What's New

It's spring in Manitoba, which means a new CAMP monitoring season is here! In this issue of our newsletter, we'll explore the Lower Nelson River region and learn about some of the components monitored by CAMP. We'll also hear about a new continuous monitoring site that was recently installed in the Winnipeg River Region. Keep reading for this and more!

About the Program

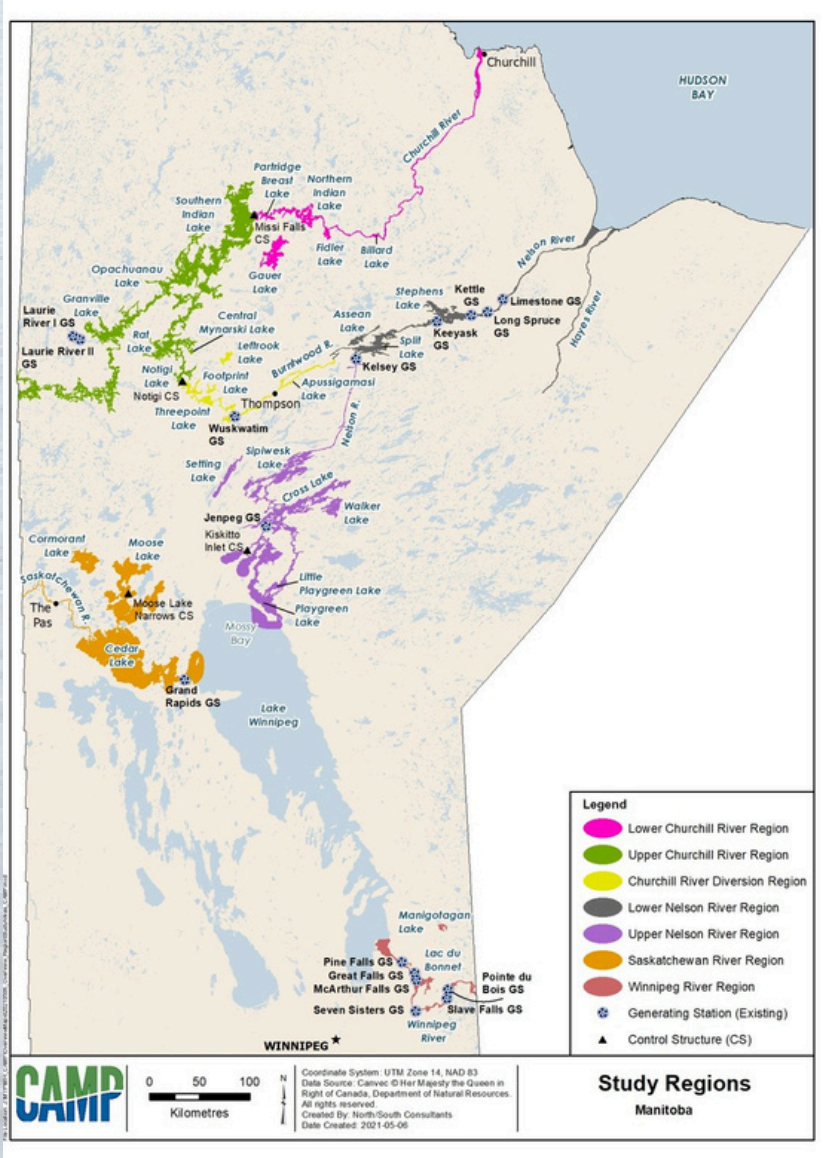
The Coordinated Aquatic Monitoring Program (CAMP) was established in 2006 as a partnership between the Province of Manitoba and Manitoba Hydro. CAMP is a long-term aquatic monitoring program to study and monitor the health of rivers and lakes affected by Manitoba Hydro's generating system.

We monitor water bodies in regions all around the province in relation to Manitoba Hydro's infrastructure.

Components currently monitored under CAMP include:

- hydrometrics
- water quality
- benthic invertebrates
- fish community
- mercury levels in fish
- phytoplankton
- sediment quality
- physical environment

CAMP monitors some waterbodies on an annual basis and some on a three-year rotational basis.



Visit our new website at campmb.ca

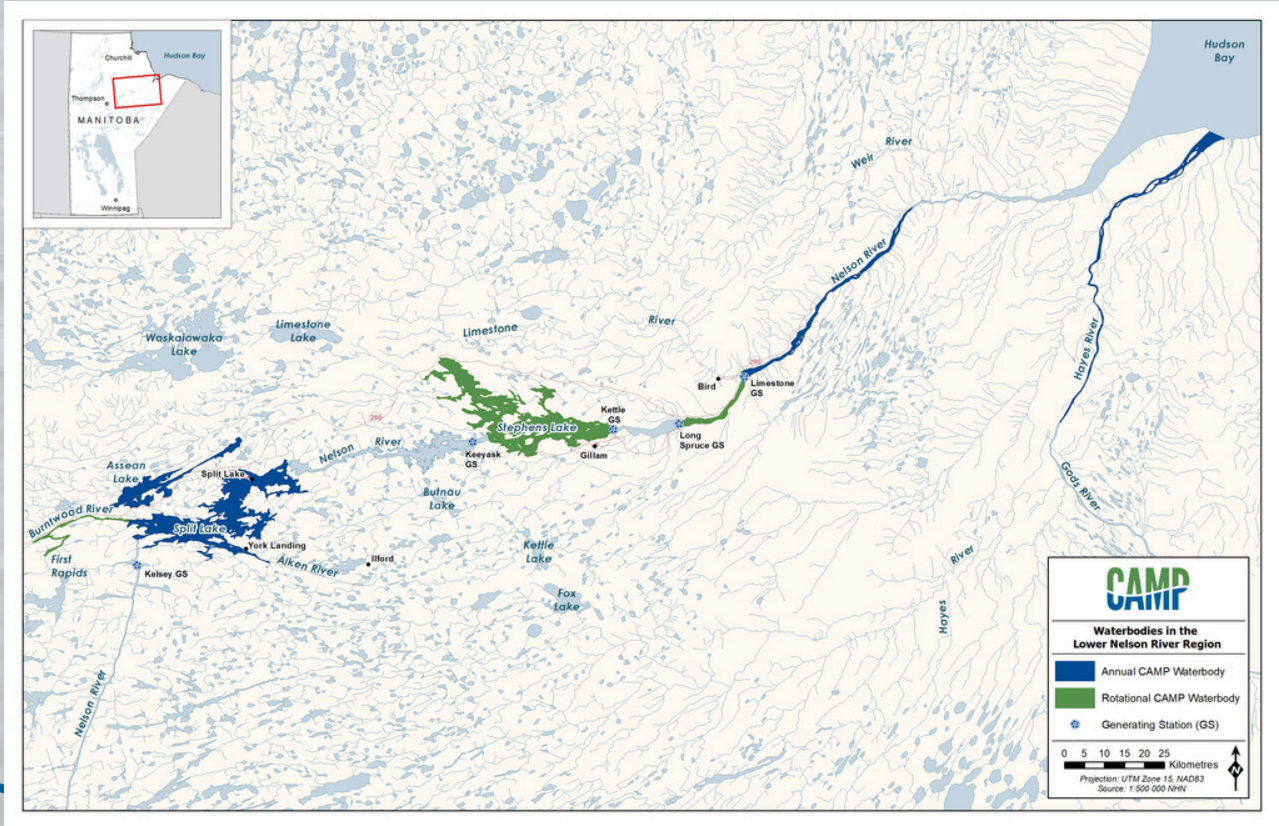
CAMP Study Region Profile

Lower Nelson River Region

In this issue of CAMP Connections, we are highlighting the Lower Nelson River Region, one of the seven CAMP Study Regions. Communities in the region include Tataskweyak Cree Nation, York Factory First Nation, Fox Lake Cree Nation, War Lake First Nation, the Town of Gillam, and the City of Thompson. Waterbodies in the region fall within the Split Lake, Fox Lake, and York Factory Resource Management Areas.

The Lower Nelson River Region extends from the Kelsey Generating Station downstream to Hudson Bay and includes the Burntwood River from First Rapids to Split Lake. Waterbodies along the lower Nelson River include Split, Clark, Gull and Stephens lakes, and the Long Spruce and Limestone Generating Station reservoirs. Split Lake is where water from the Churchill River Diversion (CRD) meets the Nelson River, with the lake experiencing impacts from both the CRD and Lake Winnipeg Regulation. The lower Nelson River is regulated for hydroelectricity generation through the Keeyask, Kettle, Long Spruce and Limestone Generating Stations.

While the lower Nelson River cuts through the Boreal Shield and Hudson Plain ecozones, the contributing watershed encompasses almost all other ecozones in Manitoba, including the Taiga Shield, the Boreal Plain, and the Prairie. Vegetation commonly found in the region includes stunted black spruce, aspen, and willows.



CAMP monitors the following waterbodies in the Lower Nelson River region:

- Split Lake (annual)
- Nelson River, downstream of the Limestone Generating Station (annual)
- Stephens Lake (rotational)
- Burntwood River (annual - water quality; rotational - benthic invertebrates and fish)
- Hayes River (annual, off-system)
- Assean Lake (rotational, off-system)

Because CAMP is a long-term monitoring program, it may take many years of monitoring before changes can be detected. After analyzing data collected during the first six years of CAMP, it was found that fish populations in the Lower Nelson River region included an abundance of top-level predators. There appears to be fewer types of fish (lower species diversity) present in reservoirs compared to the Burntwood River. It will be important to continue to collect and analyze data to better understand the aquatic environment and see whether this trend continues over the long term.

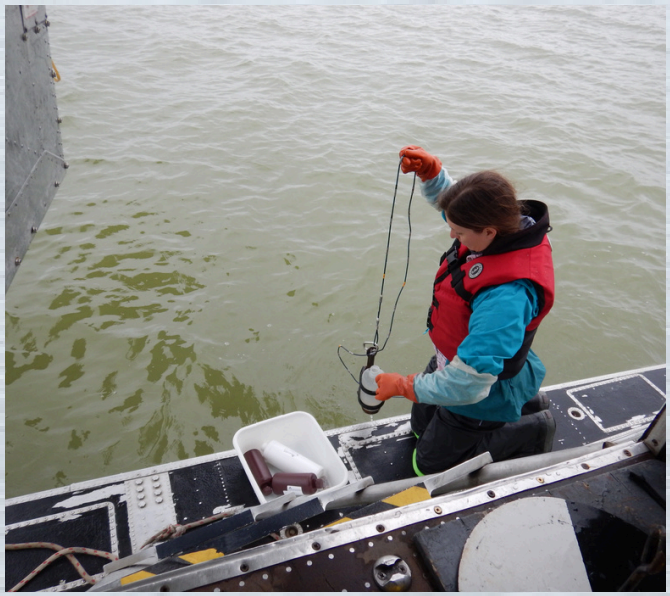
Split Lake

Stephens Lake

Science Corner

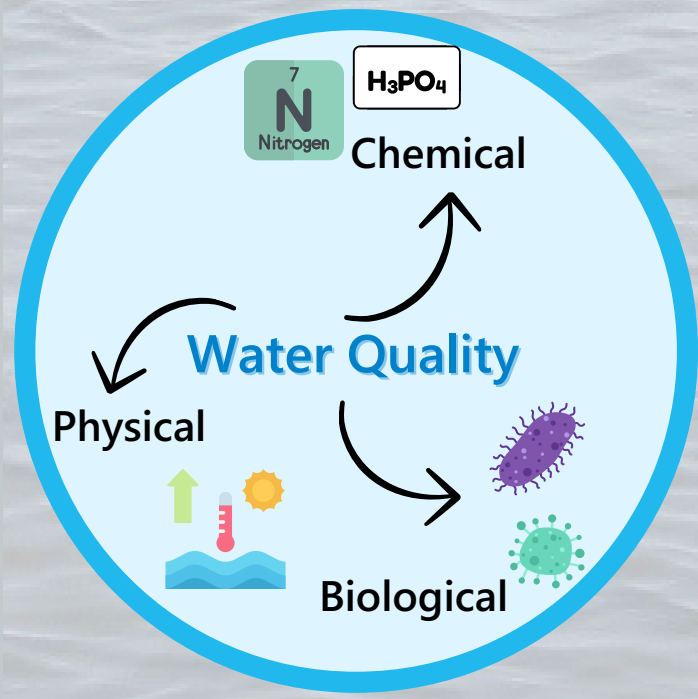
Water Quality

What's one thing an aquatic ecosystem can't exist without? Water, of course! As water is a fundamental part of aquatic ecosystems, the quality of that water is very important. **Water quality refers to the chemical, physical, and biological characteristics of water.** The chemical part of water quality includes the presence and amount of nutrients like phosphorous. Physical characteristics include temperature and clarity. And biological characteristics refer to the microorganisms in the water.



Collecting water samples, Stephens Lake

Water quality monitoring is used by CAMP to help understand the health of aquatic ecosystems. Hydro operations can have effects on water quality; for example, changes in water levels in some areas may contribute to erosion which in turn can increase turbidity (water clarity). Poor water quality may be harmful to aquatic life. For example, it may affect the condition, growth, survival, and reproduction of organisms like fish or benthic invertebrates.



CAMP's water quality program monitors over 50 parameters including those that are essential to aquatic life, such as nutrients and dissolved oxygen. Water quality objectives and guidelines developed by the Manitoba government are used as a reference for CAMP data to help understand how water quality conditions may be affecting aquatic life.

To learn more about the provincial water quality standards, objectives, and guidelines, visit: Environment and Climate Change | Province of Manitoba (gov.mb.ca)

Tiny Indicators with a Big Story: Monitoring Benthic Invertebrates

Did you know that the smallest creatures in an aquatic ecosystem can tell us big things about the health of a lake or river? Benthic Macroinvertebrates (BMIs) are small animals without a backbone that live at the bottom of a waterbody. BMIs include organisms that spend all or part of their lives in the water, like snails, clams, crayfish, and even some insects like mayflies and caddisflies.

Despite their small size, BMIs play an important role in aquatic ecosystems as they are a food source for most fish species and are also biological indicators. This means that the status of a BMI population can reveal information about the overall health of a waterbody.

In addition to being an important part of the food chain, BMIs are ideal biological indicators because they tend to stay in the same place over time, have relatively long lives, and there are lots of them. This means that not only do they reflect the conditions of a specific location and how it may have changed over time, but they are also easy to collect, making them an ideal component for a monitoring program.

Photo taken at Playgreen Lake

Off-shore samples are collected with a grab sampler (bottom left) while near-shore samples are collected with a kicknet sampler (bottom right)

Photo taken at Assean Lake

Photo taken at Threepoint Lake

CAMP is an aquatic ecosystem monitoring program with the goal of understanding environmental conditions in waterways across Manitoba. Because of their importance as biological indicators, BMIs are among the components monitored through CAMP.

In late summer and early fall, BMI samples are collected from the bottoms of the lakes and rivers monitored through CAMP. Several samples are taken from two locations – one along the shore, and one where the water is deeper, reflecting the different habitats where BMIs live. The samples are then counted, sorted, and identified by type, and the results are presented to describe the BMI population for each of the habitats.

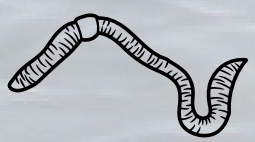
One of the main things we look at when examining a BMI population is the total number of organisms. The size of the population is influenced by physical, biological, and chemical factors such as the amount of water flowing through a river (physical factor), the presence of algae (biological factor), and the amount of dissolved oxygen in the water (chemical factor). As such, the total number of organisms collected from a CAMP monitoring site reflects the many variables that affect the health of the lake or river. If we notice changes in the size of the BMI population, we can report the changes for further study.

The next time you see a snail, mayfly, or other BMI, don't be fooled by its small size, it has a big story to tell!

Crayfish from Playgreen Lake

What do you call a benthic invertebrate that likes to party?

A cray-crayfish!



CAMP News

New continuous monitoring site installed at Pine Falls

Did you know that CAMP collects water quality data in some waterbodies every five minutes? Using a device called a sonde, water quality is measured on the spot and the data is transmitted to a central database where it's stored and available for download. These sites monitor turbidity, water clarity, water temperature, dissolved oxygen, and conductivity.

CAMP operates continuous monitoring sites across the province, including the newest one installed last summer at Pine Falls. In early August 2023, the sonde was set up in the water off the front deck of the Pine Falls Generating Station. This station will let us compare data between Pine Falls and Pointe du Bois, located further upstream on the Winnipeg River.

The team will evaluate the data over the next few seasons to determine whether this location is suitable for long-term continuous monitoring of water quality.

Installing the sonde

The continuous water quality sensor is called a sonde

Continuous water quality sites monitor:

- turbidity
- temperature
- dissolved oxygen
- conductivity

CAMP Expansion Update

CAMP is taking the next step towards expanding the program. CAMP is expanding to include additional monitoring components (e.g. Shoreline Monitoring), and opportunities for collaboration and partnership with Indigenous communities. After reaching out to community leadership in the Lower Churchill, Burntwood, Lower Nelson, and Upper Nelson River areas, we met with community representatives for the first time in April.

The CAMP team was grateful to hear community perspectives, concerns, and ideas. We are looking forward to future discussions and determining a pathway towards working together.

Photo taken at Threepoint Lake

CAMP Species Feature

Northern Pike

Often lurking in shallow, weedy habitats, you might be able to spot a Northern Pike, one of the top predators in Manitoba's lakes and rivers. Also known as Jackfish, Northern Pike are considered ambush predators, as they like to sit perfectly still, hidden among vegetation, and wait for their prey before striking with remarkable speed.

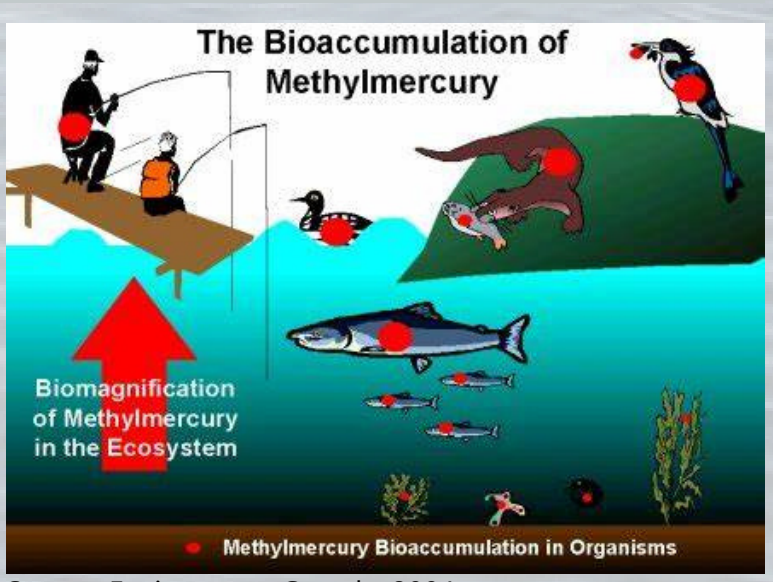
Northern Pike are found in rivers and lakes throughout most of Canada. While they look like Muskellunge (more commonly known as Muskie), Northern Pike can be distinguished by pale spots and rounded tail fins.

Because they are found just about everywhere in Manitoba and are at the top of the aquatic food chain, Northern Pike are among the species monitored through CAMP's fish mercury program.

Mercury is emitted into the atmosphere by natural sources like volcanoes and forest fires, and industrial sources like coal-fired power plants. It can also be caused by reservoir flooding created by hydroelectric dams.

Once in the atmosphere, mercury travels and spreads over a large area, eventually settling back onto the earth and into lakes. When this happens, the mercury can be taken up by small organisms living at the bottom of lakes, which are in turn eaten by fish, and then larger fish. Through this process, known as bioaccumulation, mercury becomes more concentrated in organisms higher up in the food chain. Increases in mercury levels in fish after reservoir flooding can take 30 years to return to levels observed before flooding.

Northern Pike, Pointe du Bois



Source: Environment Canada, 2004

Manitoba Hydro has been monitoring fish mercury since 1991 and continues to do so through CAMP. While mercury levels in lakes affected by the Churchill River Diversion and Lake Winnipeg Regulation project declined to minimum levels by the early 2000s, data collected through continued monitoring will be shared with communities and health regulators.

CAMP is an ecosystem monitoring program, and isn't able to provide information related to human consumption. We are currently working with public health experts from Manitoba Health and Health Canada to share fish mercury data collected by CAMP. These qualified experts will use CAMP data as part of the information considered to provide guidance related to eating healthy amounts of fish.

Northern Pike are important for both recreational and commercial fishing in Manitoba. CAMP collects data that is publicly available, and can be used for a variety of purposes including by fisheries managers and public health experts.

To learn more about CAMP's mercury in fish program, visit: https://www.campmb.ca/mercury-in-fish

To learn more about Northern Pike, visit: https://www.dfo-mpo.gc.ca/species-especes/profiles-profils/northernpike-grandbrochet-eng.html

Northern Pike, Manigotagan Lake

CAMP Monitoring Calendar

A new CAMP field season is almost here! The CAMP field crews will be out on the lakes and rivers collecting samples and data as part of our monitoring program.

This year, fish community, water quality, and benthic invertebrate monitoring will take place on waterbodies across Manitoba. For these components, CAMP monitors some waterbodies on an annual basis (each year), and some on a rotational basis (every three years).

CAMP's mercury in fish program runs on a three-year rotation. This year, samples will be collected from Threepoint Lake, Wuskwatim Lake, Leftrook Lake, Playgreen Lake, and Stephens Lake South.

Sediment quality monitoring is done on a six-year cycle. The most recent samples were collected last year, in 2023/2024.

CAMP also monitors the physical environment using water quality sensors. These sites collect data continuously throughout the year in some permanent locations, and during the summer in seasonal locations.

The full 2024/2025 fieldwork schedule will be posted online at https://www.campmb.ca/fieldwork-schedule

Measuring water clarity, Nelson River

Collecting benthic samples, Assean Lake

Manigotagan Lake

For more information on the program, visit our website www.campmb.ca