Government of
Northwest Territories

NWT Water Monitoring Bulletin – May 22, 2025 at 14:00

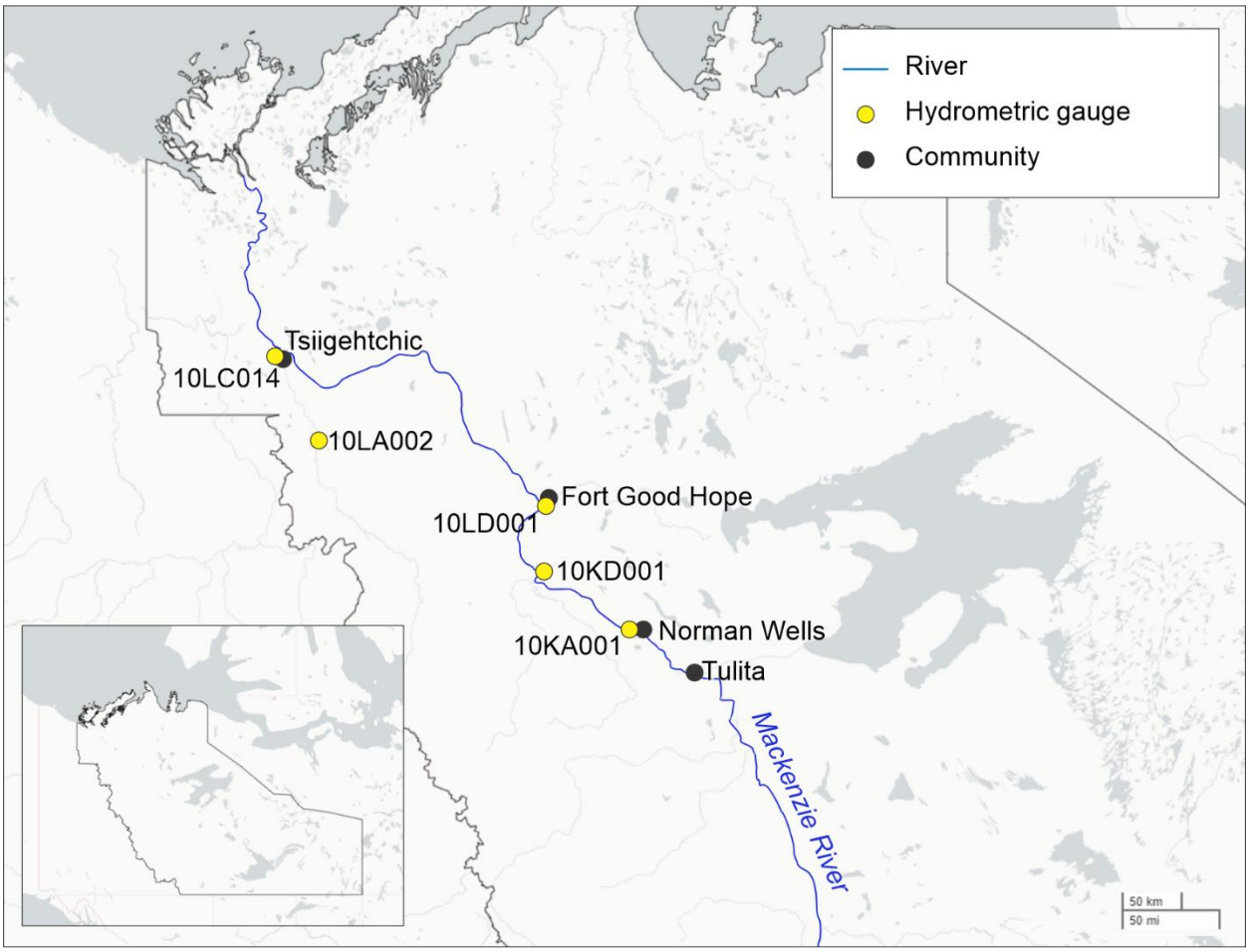
NWT break up reports will be published routinely as break up unfolds. These reports will focus on regions with active snowmelt and ice break up. The geographic focus of the report will shift as conditions change. Additional information about basin conditions can be found in the ECC Snow Survey Bulletin and Spring Water Outlook, available here. If you have any photos or information about break up in your community, feel free to reach out to us: nwtwaters@gov.nt.ca.

Current Status:

- Break-up is progressing along the Mackenzie River in the Sahtu region;
  - Large sections of rubble ice started to push downstream past Norman Wells and Fort Good Hope last night.
  - Ice has been jamming and releasing in this section of the Mackenzie River this morning.
  - Open water sections are growing between Fort Good Hope and Tsiigehtchic.
  - Imagery from hydrometric gauges show that river ice is starting to melt along the shore of the Mackenzie River near Tsiigehtchic.
- The water level measured on the Mackenzie River at Norman Wells peaked at 8.9 m last night, and has since receded to 7.3 m.
  - For reference, the water level on the Mackenzie at Norman Wells peaked at 12.9 m during the high-water year of 2021.
  - Water level measured on the Mackenzie near Tsiigehtchic is rising underneath mostly intact ice.
- Average to above average temperatures are expected for the rest of the week for the Sahtu region, which will result in continued melt of river ice and snow.

Contents

Station map:

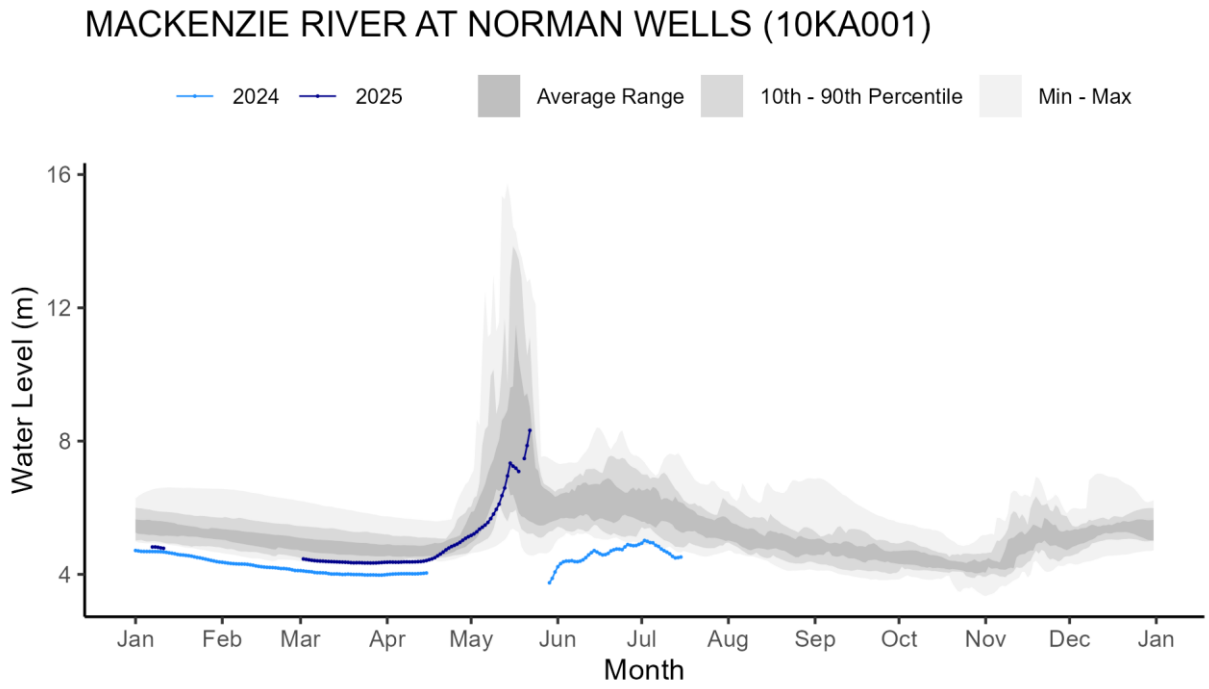


Above – Map of Hydrometric stations and nearby communities for the plots included in this report.

Mackenzie River

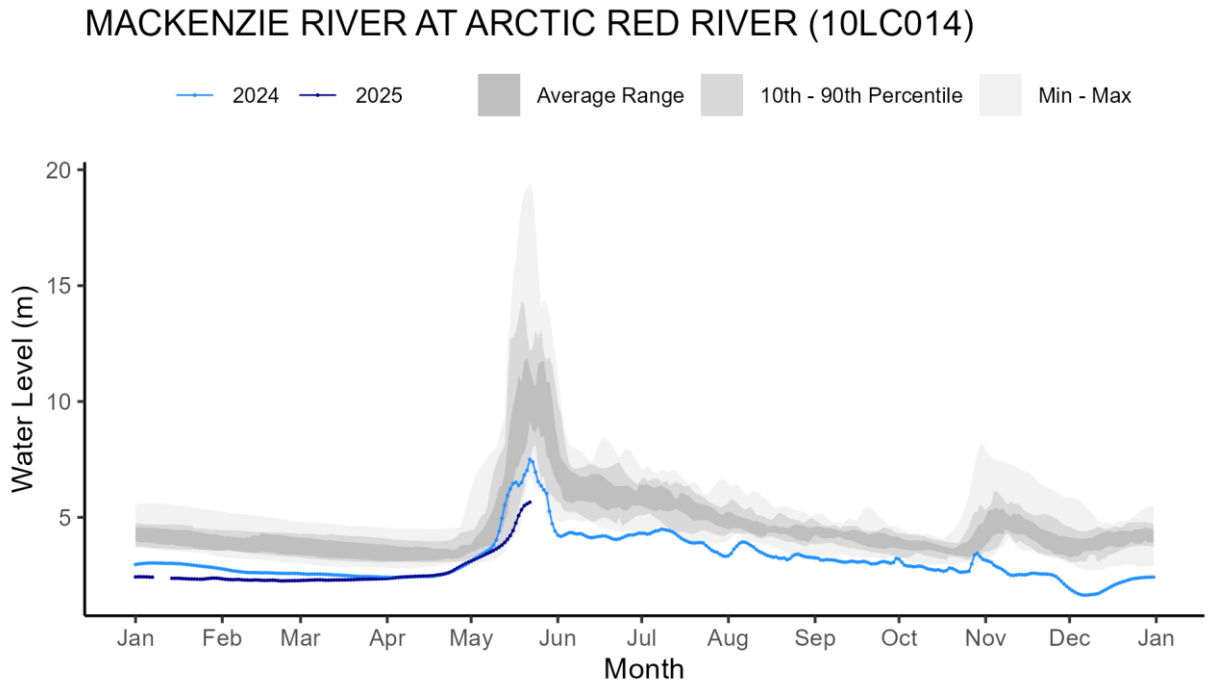
Hydrometric Data:

Mackenzie River at Norman Wells [10KA001]



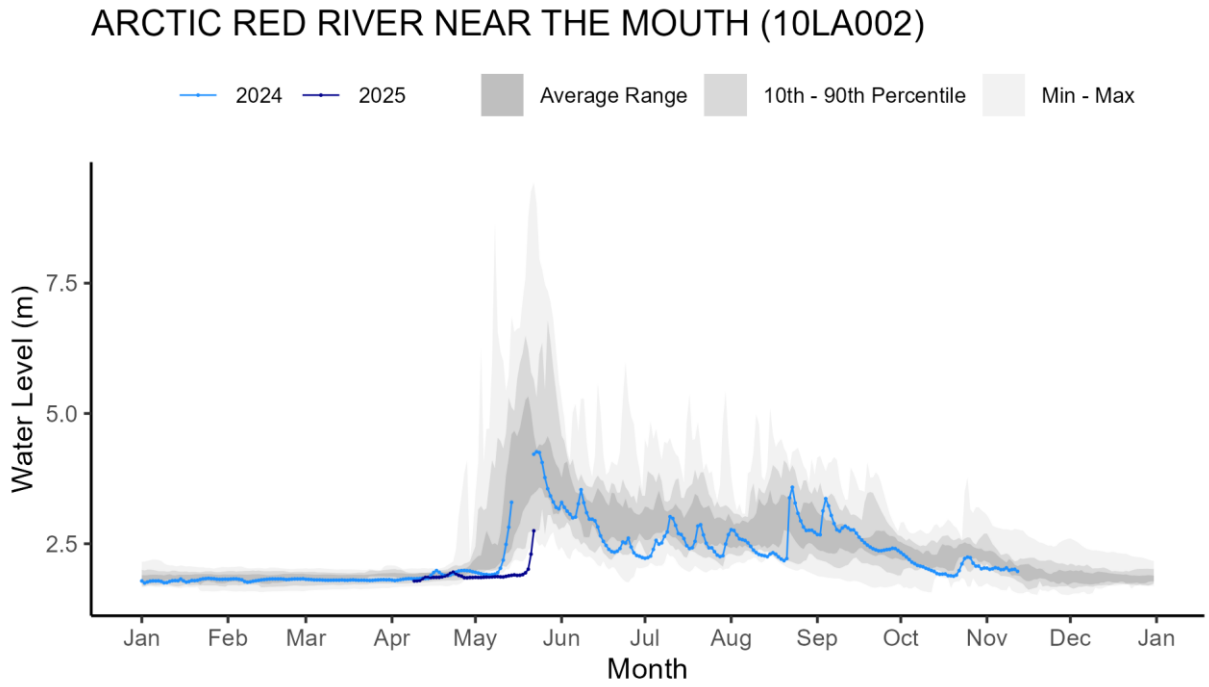
Above - Water level data for Mackenzie River at Norman Wells [10KA001]. Daily average levels for the previous year also are shown here.

Mackenzie River at Arctic Red River [10LC014]



Above - Water level data for Mackenzie River at Arctic Red River [10LC014]. Daily average levels for the previous year also are shown here.

Arctic Red River near the Mouth [10LA002]



Above - Water level data for Arctic Red River near the Mouth [10LA002]. Daily average levels for the previous year also are shown here.

Gauge photos:

Mackenzie River at Sans Sault Rapids [10KD001]

Above - Mackenzie River at Sans Sault Rapids [10KD001] hydrometric gauge photo from May 22 at 12:00. Photo courtesy of Water Survey of Canada and GNWT.

Mackenzie River at Fort Good Hope [10LD001]

Above - Mackenzie River at Fort Good Hope [10LD001] hydrometric gauge photo from May 22 at 13:00. Photo courtesy of Water Survey of Canada and GNWT.

Above - Mackenzie River at Fort Good Hope [10LD001] hydrometric gauge photo from May 22 at 8:00. Photo courtesy of Water Survey of Canada and GNWT. **Note: this image was taken before the image on page 7 and is meant to show some of the ice movement observed so far today for this stretch of the river.**

Mackenzie River at Arctic Red River [10LC014]

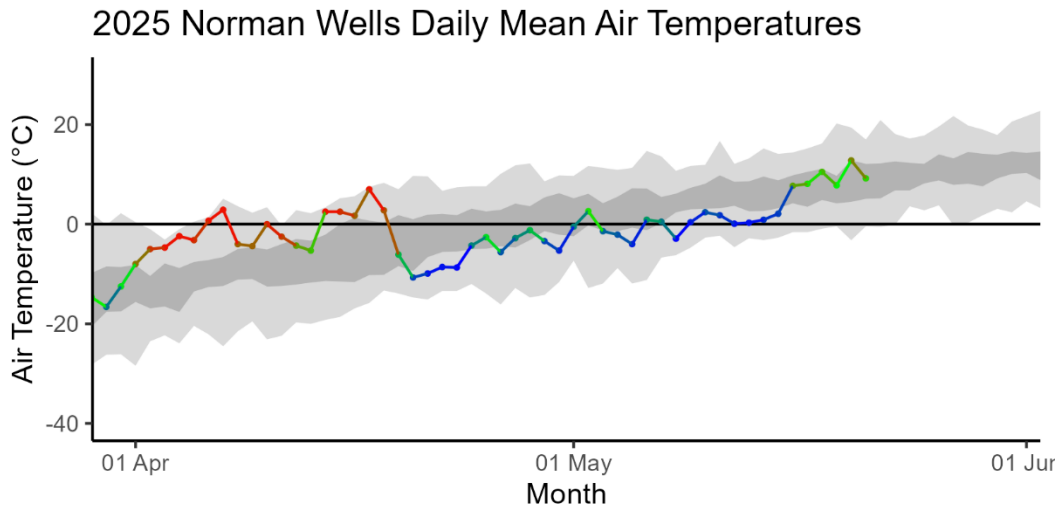
Above - Mackenzie River at Arctic Red River [10LC014] hydrometric gauge photo from May 22 at 09:00. Photo courtesy of Water Survey of Canada.

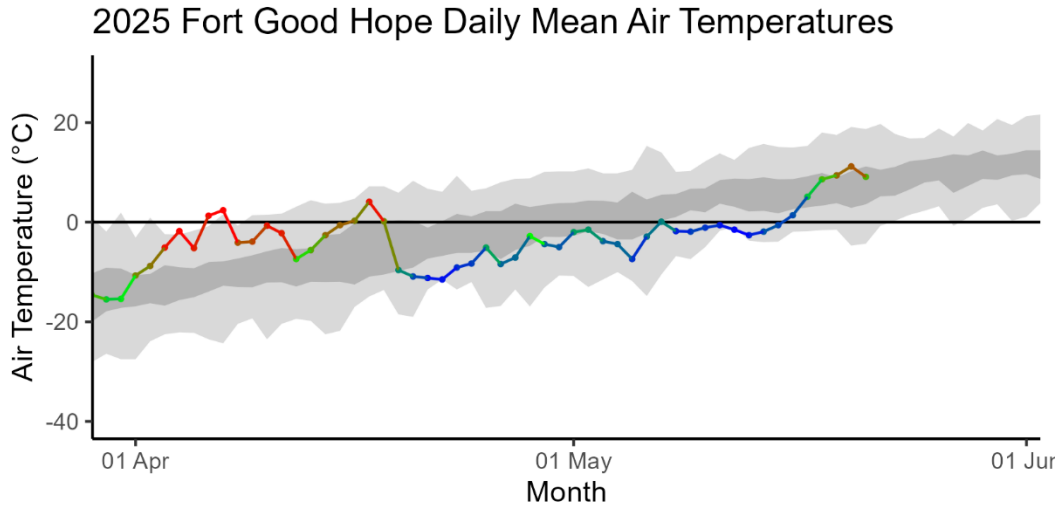
Weather Data:

Weather information informs how snow and ice will melt and provides information about how this spring is unfolding relative to previous springs. Warmer than normal conditions early in the spring allow for additional energy to melt the snowpack and soften river ice. Rain-on-snow events can cause rapid melt of snowpacks and facilitate quick delivery of snowmelt water to rivers. Locations included here cover basin areas that feed into NWT rivers that are currently undergoing break-up. The first set of figures show how temperatures have been relative to average (dark grey band) this spring, while the second set is Environment and Climate Change Canada (ECCC) weather forecast data for the next seven days.

The Sahtu region has seen recent average to above average temperatures after a cooler than normal late April and early May. Norman Wells and Fort Good Hope are forecast to see temperatures that are average to above average for the rest of the week, and overnight lows will be above zero. These temperatures should result in continued melt of river ice and snow.

The Sahtu region is forecast to receive small amounts (< 5 mm) of precipitation over the next few days.





Norman Wells seven-day forecast:

Thu 22 May	Fri 23 May	Sat 24 May	Sun 25 May	Mon 26 May	Tue 27 May	Wed 28 May
6°C	9°C	14°C	19°C	20°C	12°C	14°C
Showers	30% Chance of showers	Cloudy	Sunny	60% Chance of showers	A mix of sun and cloud	A mix of sun and cloud
Tonight	**Night**	**Night**	**Night**	**Night**	**Night**	
3°C	4°C	5°C	5°C	4°C	5°C	
30% Chance of showers	Cloudy	Cloudy periods	Clear	Cloudy periods	Cloudy periods	

Fort Good Hope seven-day forecast:

Thu 22 May	Fri 23 May	Sat 24 May	Sun 25 May	Mon 26 May	Tue 27 May	Wed 28 May
12°C	13°C	13°C	19°C	19°C	19°C	21°C
30% Chance of showers	30% Chance of showers	Cloudy	Sunny	A mix of sun and cloud	A mix of sun and cloud	A mix of sun and cloud
Tonight	**Night**	**Night**	**Night**	**Night**	**Night**	
4°C	6°C	5°C	6°C	8°C	8°C	
Partly cloudy	Cloudy	Cloudy	Clear	Cloudy periods	Cloudy periods	

Factors to Watch:

It is important to note that much of the water contributing to NWT rivers originates from outside of the NWT, which is why we also rely on information from the Yukon, British Columbia, Alberta and Saskatchewan.

The potential and severity of flooding will depend in large part on the weather over the upcoming weeks and how this interacts with existing ice conditions, water levels and snowpack amounts.

The primary factors that influence water levels in the spring are:

- Ice jams (can result in out-of-bank flows, even if there are below normal flows)
- Rate of melt of ice and snow:
    - Gradual vs quick melt
    - Rain on snow or ice events (rain brings a lot of energy to help melt happen more quickly)
- Current water levels
- How wet the ground was in the fall
- Snowpack

Spring Break up on NWT Rivers: Mechanical vs Thermal

In any given year, spring flooding can occur in a number of NWT communities, including Hay River, Jean Marie River, Fort Simpson, Fort Liard, Tulita, Fort Good Hope, Fort McPherson and Aklavik. Spring flooding is caused by ice jam-induced flooding and can occur irrespective of existing water levels. However, if existing water levels are high, the impact of an ice jam flood can be much worse.

Ice jams typically occur on north-flowing rivers where warm weather and snowmelt cause ice to break up on the southern reaches of a river. As this ice flows north (downstream), it meets a more solid ice cover, hits the ground, or gets stuck in a river bend. When this happens, the pieces of floating ice jam can form a dam, which causes water levels to rise rapidly. This is called a **mechanical break up**, whereby the ice downstream is broken up by the force of ice moving into it.

If there is warm and sunny weather throughout early spring, the ice may thermally erode and weaken. This provides less of a resisting force for ice and water moving down the river and will have less of a chance of causing water levels to rise behind an ice jam. This is called a **thermal break up**.

The causes of mechanical and thermal break ups are usually dependent on the weather during early spring. Warm weather, sunshine, and rain on snow events are usually a good way to bring extra energy into the system to help melt the ice. Warm temperatures in the upstream part of a basin could also cause a rapid snowmelt and move water to the river very quickly. This could lead to ice-jam conditions downstream if the ice has not yet received enough energy to degrade. Another important factor is the thickness of the ice. Thicker ice takes longer to melt and can increase the

chances of ice jams. If an ice jam occurs, the location of the ice jam is also very important. Each river reach has different locations that are prone to ice jams. The location of the ice jam can be an important factor as to whether or not a community floods. Furthermore, ice will jam and then move again at multiple locations along a river as break up progresses downstream. The timing and location of each jam can also influence if a community will flood.

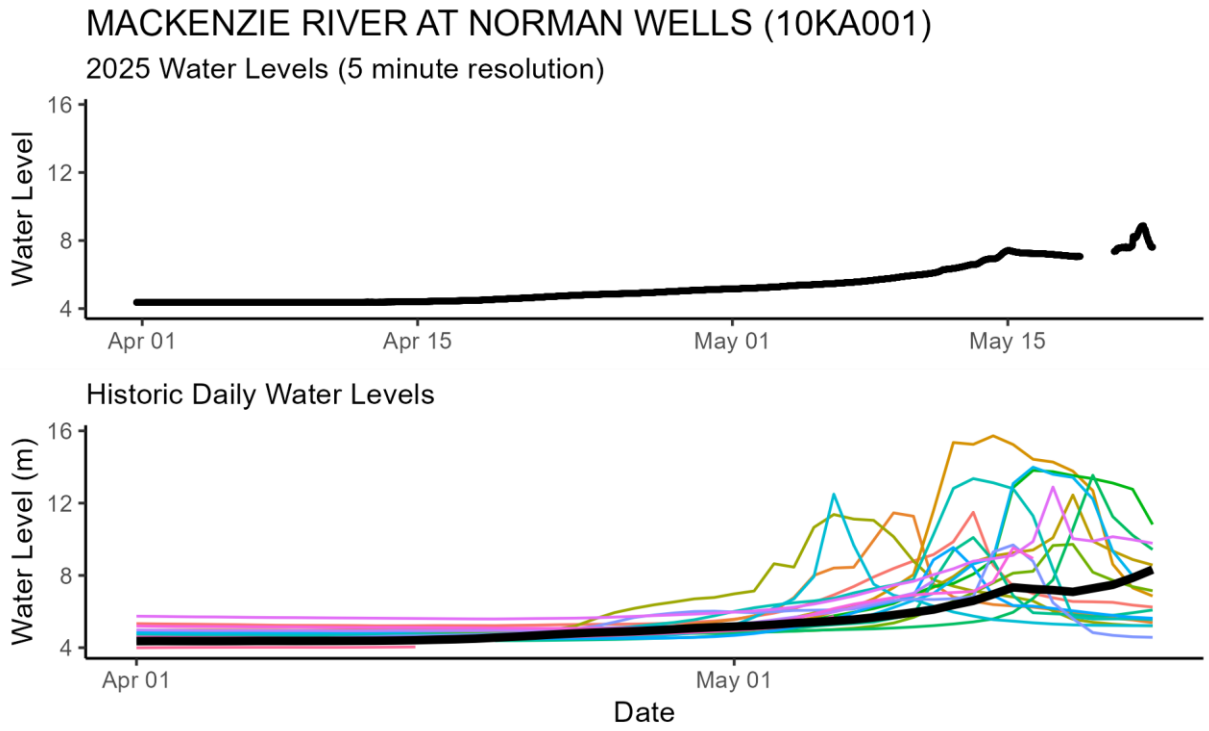
Technical Note:

- The figures in this report plot water levels. The values on the y-axis are (in most cases) relative to an arbitrary datum. This means that the values on each gauge can be compared to different years but should not be used to compare water levels from one location to the next.

For example, the Hay River near the border gauge (07OB008) records a level of about 288 m. The Hay River near Hay River gauge (07OB001) usually records a level of about 4 m. This **does not mean** that the water level at the Hay River at the border site is 284 m higher than the water level at the Hay River near Hay River site.

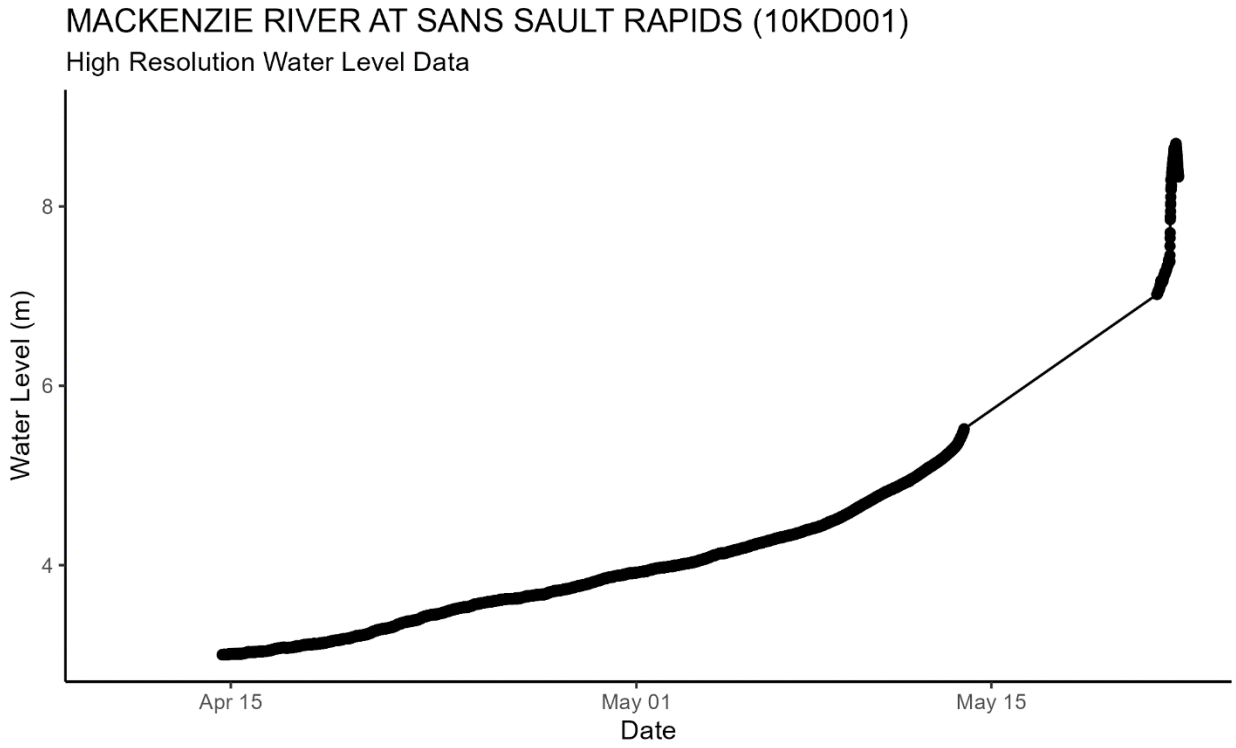
Appendix A: High resolution and historic water level plots

Mackenzie River at Norman Wells [10KA001]



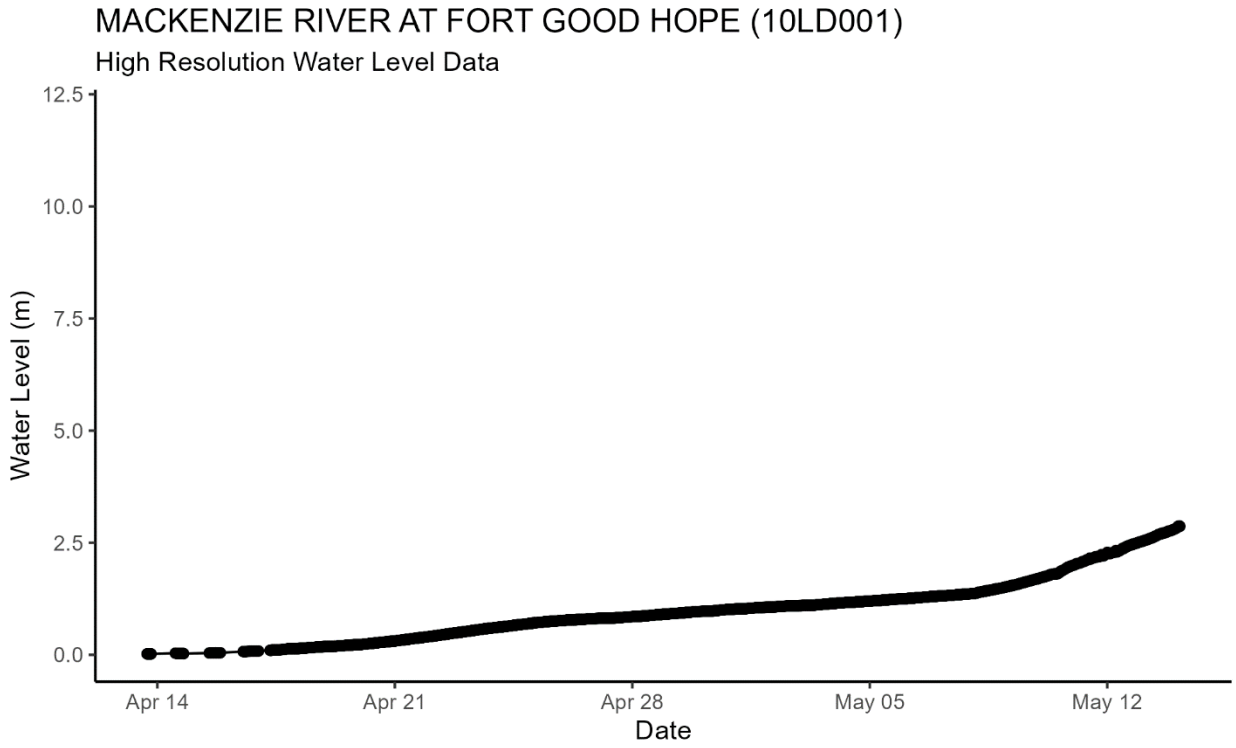
Above - The upper graph in the figure presents real time water level data at 5-minute resolution. The lower graph shows daily average levels relative to the previous 20 years.

Mackenzie River at Sans Sault Rapids [10KD001]



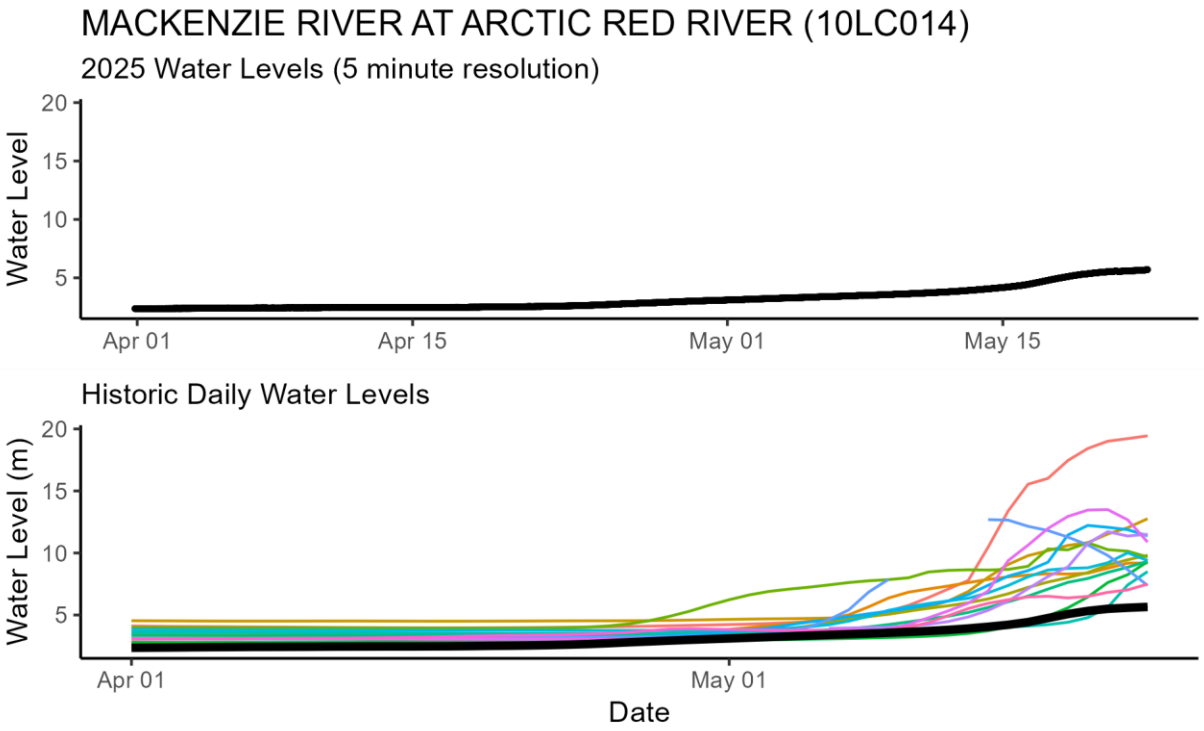
Above – This graph presents real time water level data at 5-minute resolution. **Note: there is a data gap between May 13th and May 21st when the sensor was damaged by river ice.**

Mackenzie River at Fort Good Hope [10LD001]



Above – This graph presents real time water level data at 5-minute resolution. **Note: Current water level data are not available as the sensor was damaged by ice last week.**

Mackenzie River at Arctic Red River [10LC014]



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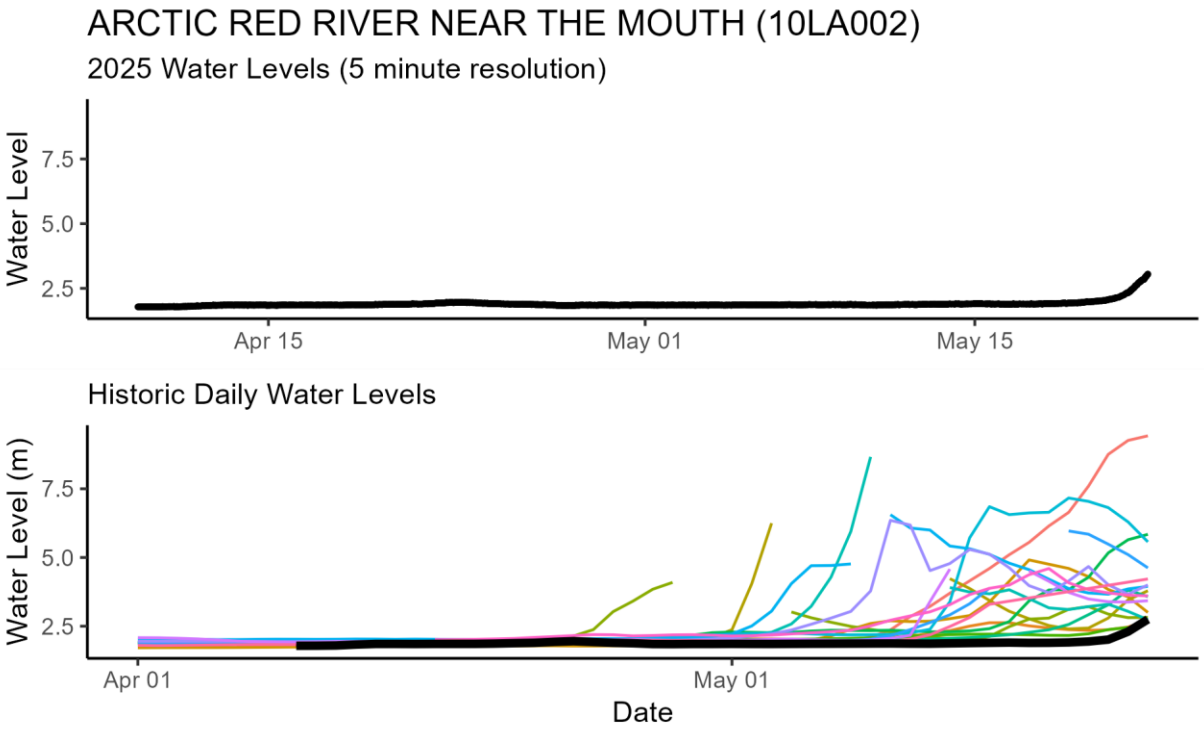
Arctic Red River near the Mouth [10LA002]



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