Government of
Northwest Territories

NWT Water Monitoring Bulletin – May 6, 2025 at 15:30

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:

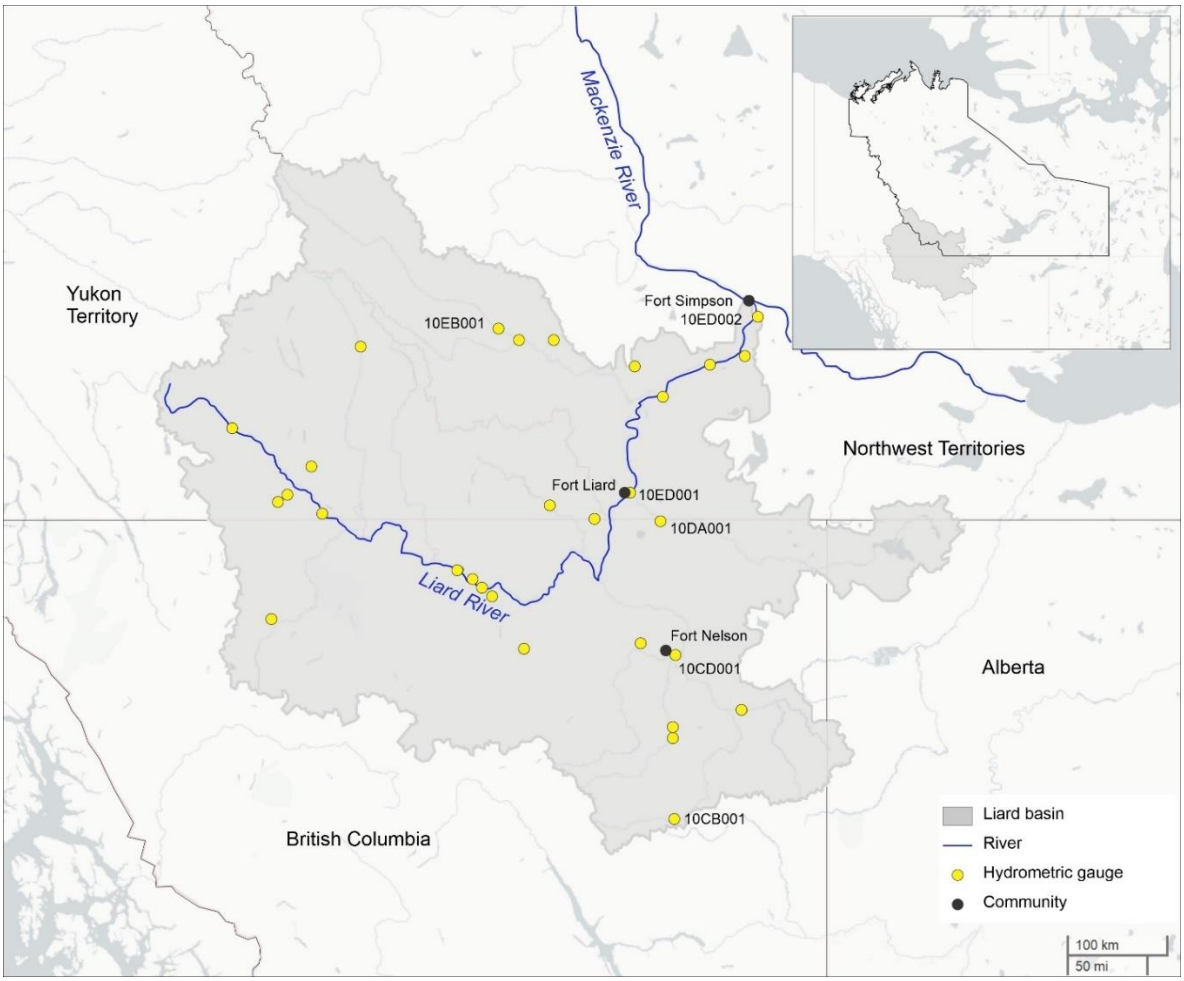
- The 2025 break-up flood risk has passed for Hay River.
- Break-up has been progressing along the Mackenzie River between Fort Providence and Fort Simpson;
    - Large sections of rubble and sheet ice moved through Fort Simpson this morning, leaving open water near Fort Simpson.
    - Relatively small fluctuations in water level have been observed in response to ice movement.
- Break-up has been progressing along the Liard River;
    - The ice front is approximately 60 km upstream of Fort Simpson.
    - Increases in water level on the Liard River at the ferry crossing have been relatively small.
    - Sheet ice is melting in place on the Liard River near the mouth.
- Warmer than average temperatures today and tomorrow are expected to result in continued break-up and ice movement on the Liard River.

Contents

Liard River

Current Status:

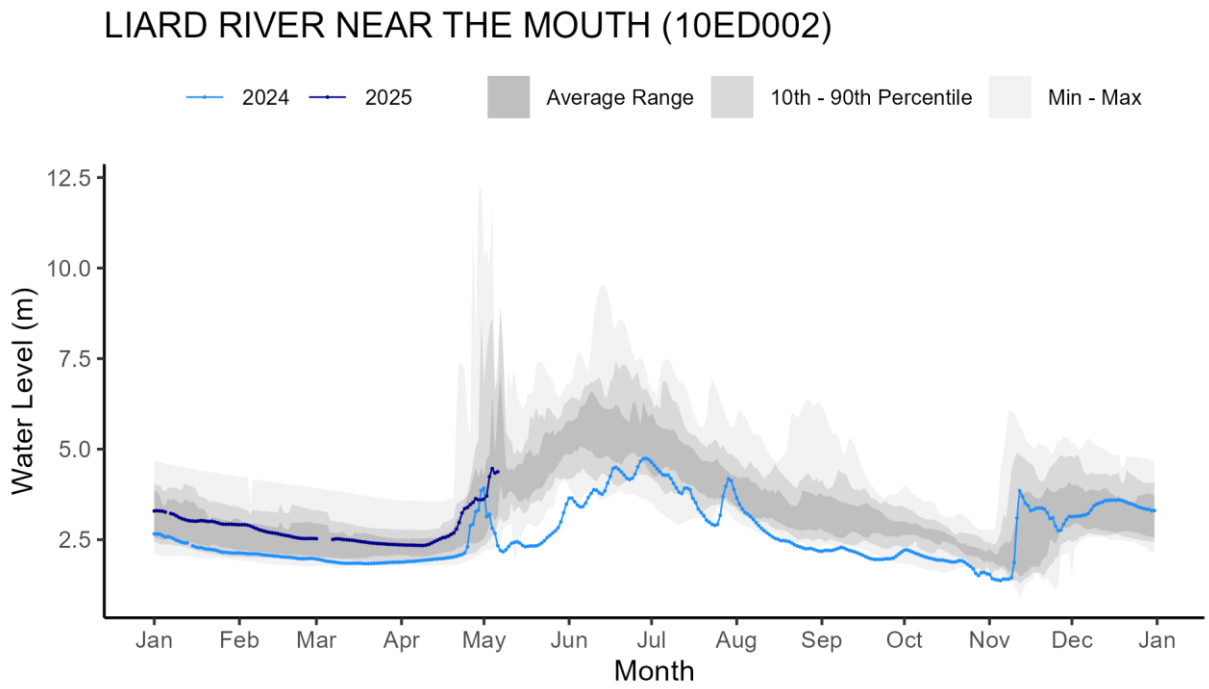
- Break-up has been progressing along the Liard River;
    - The ice front is approximately 60 km upstream of Fort Simpson.
    - Water level has been variable over the last 24 hours, and fluctuations in water level have been relatively small.
    - Sheet ice is melting in place on the Liard River near the mouth.
- Warmer than average temperatures are forecasted for today and tomorrow, so continued ice movement and break-up is anticipated on the Liard River.



Above – Map of hydrometric stations in the Liard River basin. The station numbers are referenced in the water level plots below.

Hydrometric Data:

Liard River near the Mouth [10ED002]:



Above - Water level data for Liard River near the Mouth [10ED002]. Daily average levels for the previous year also are shown here.

Gauge photos:

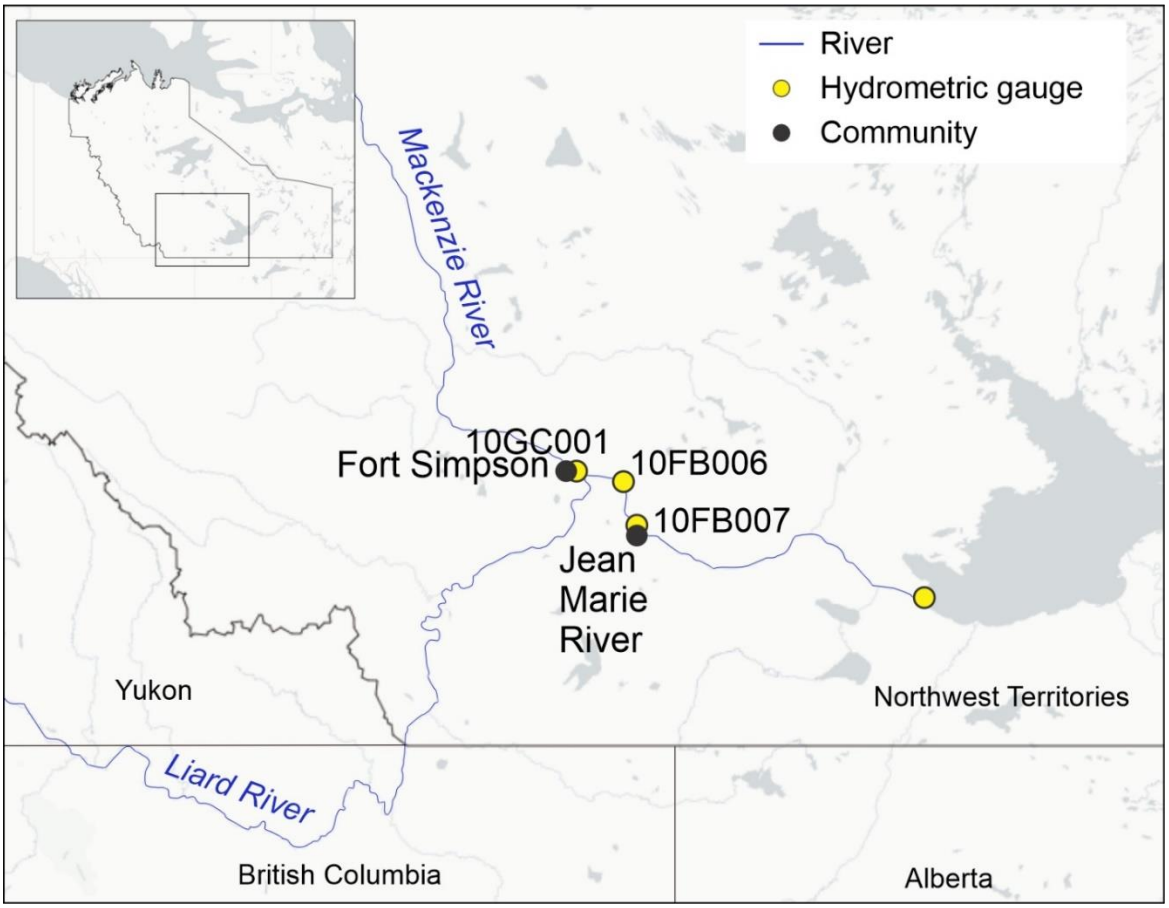
Liard River near the Mouth [10ED002]:

Above - Liard River near the Mouth [10ED002] hydrometric gauge photo from May 6 at 14:00. Photo courtesy of Water Survey of Canada and GNWT.

Mackenzie River

Current Status:

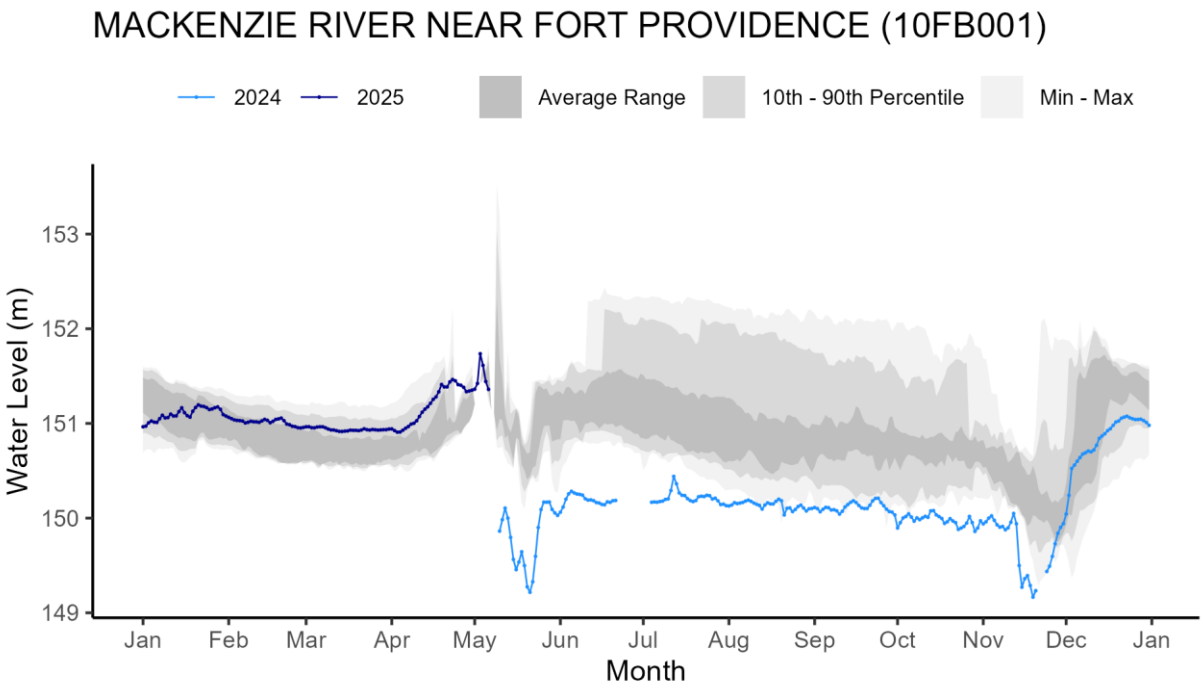
- Break-up has been progressing along the Mackenzie River between Fort Providence and Fort Simpson;
    - Large sections of rubble and sheet ice pushed downstream past Fort Simpson this morning, creating open water sections near Fort Simpson.
- Water level measured using the Village of Fort Simpson gauge has increased by about 1 m since Saturday.
    - The water level was 5.6 m this morning. For reference, the water level exceeded 15 m during the flood event of 2021.
- Water level measured on the Mackenzie River near Jean Marie River has been variable in response to ice movement, but levels remain low.



Above – Map of hydrometric stations along the Mackenzie River near Fort Simpson and Jean Marie River. The station numbers are referenced in the water level plots below.

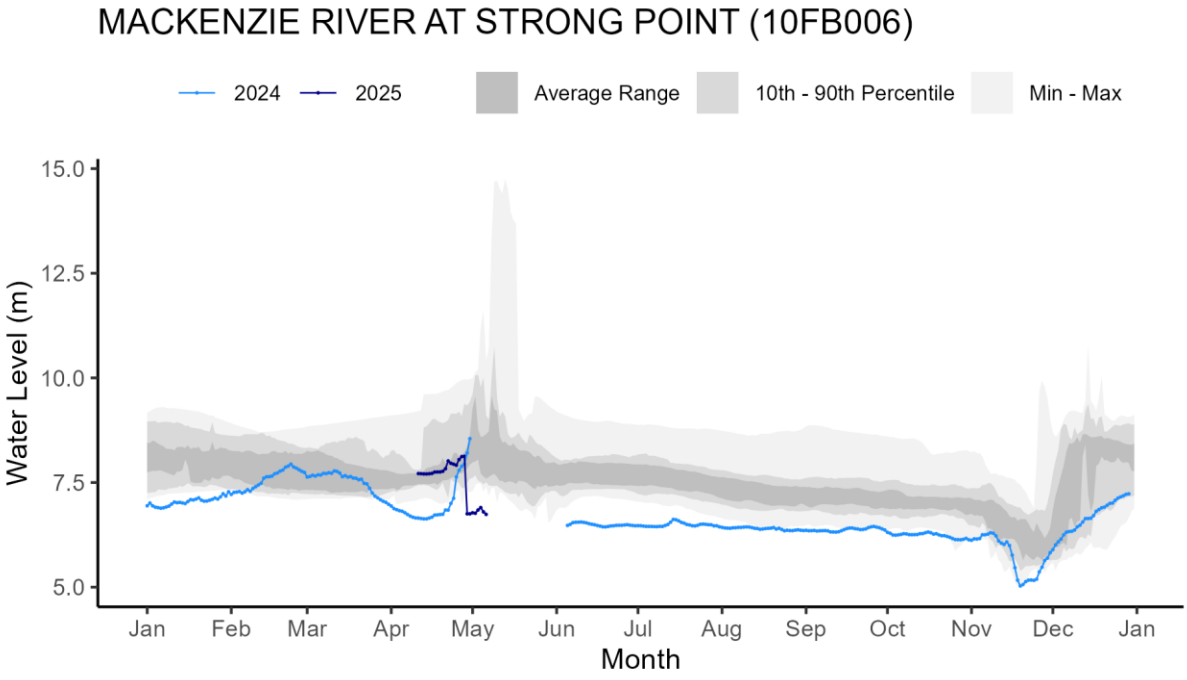
Hydrometric Data:

Mackenzie River near Fort Providence [10FB001]:



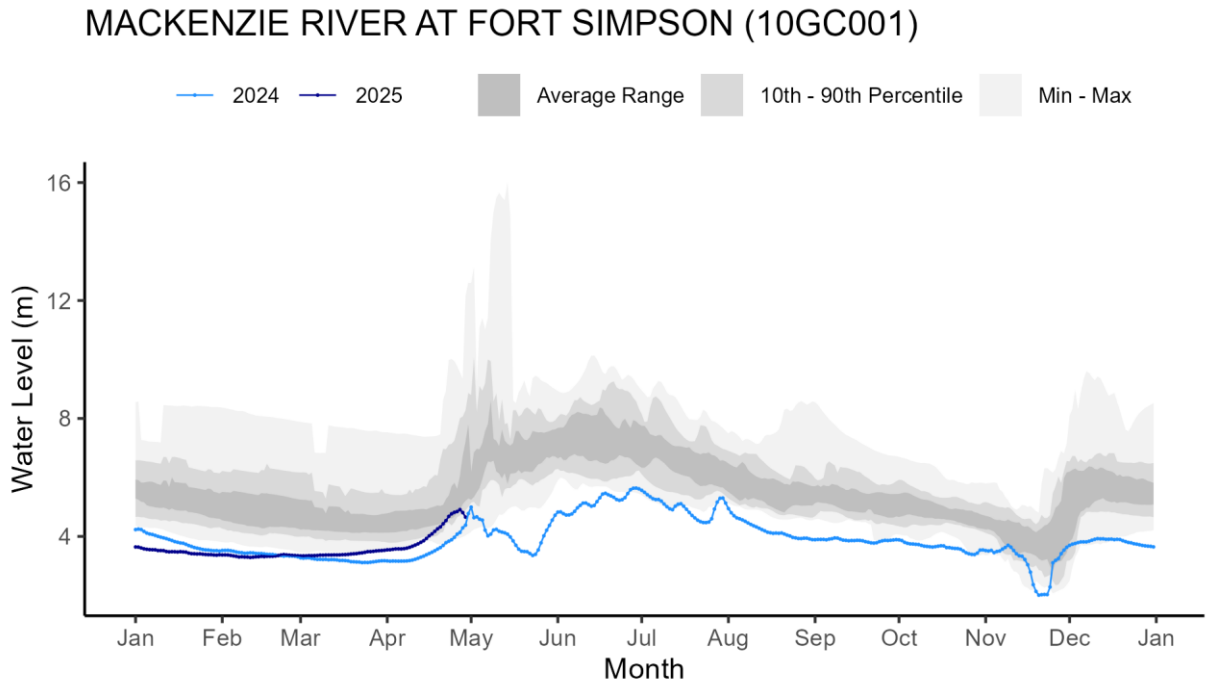
Above - Water level data for Mackenzie River near Fort Providence [10FB001]. Daily average levels for the previous year also are shown here.

Mackenzie River at Strong Point [10FB006]:



Above - Water level data for Mackenzie River at Strong Point [10FB006]. Daily average levels for the previous year also are shown here.

Mackenzie River at Fort Simpson [10GC001]:



Above - Water level data for Mackenzie River at Fort Simpson [10GC001]. Daily average levels for the previous year also are shown here. Note: Sensor was damaged by river ice and current data are unavailable. Water level was recorded using the Village of Fort Simpson gauge at 5.6 m as of 9:00 MDT this morning.

Gauge photos:

Mackenzie River at Strong Point [10FB006]:

Above - Mackenzie River at Strong Point [10FB006] hydrometric gauge photo from May 6 at 14:00. Photo courtesy of Water Survey of Canada and GNWT.

Mackenzie River at Fort Simpson [10GC001]:

Above - Mackenzie River at Fort Simpson [10GC001] hydrometric gauge photo from May 6 at 14:00. Photo courtesy of Water Survey of Canada and GNWT.

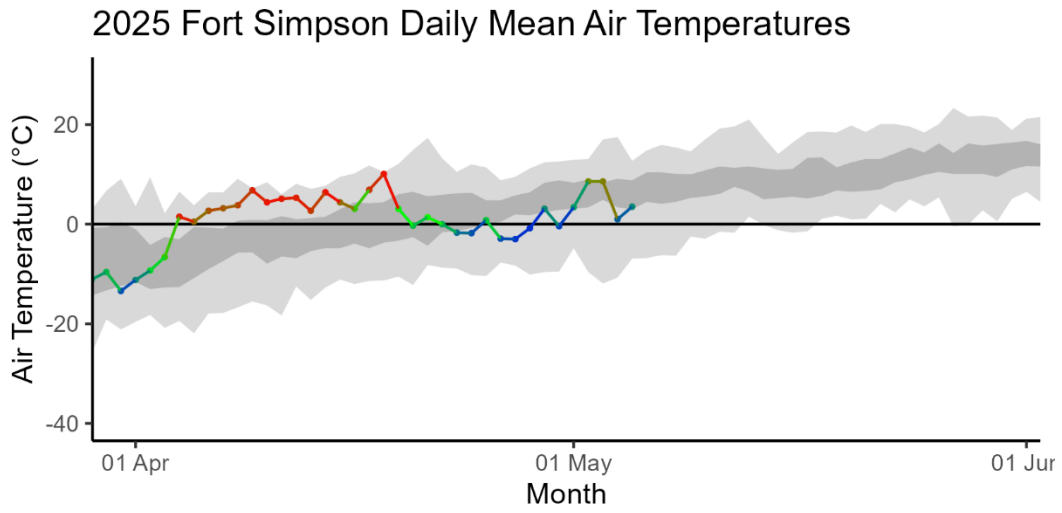
Mackenzie River at Fort Simpson [10GC001]:

Above - Mackenzie River at Fort Simpson [10GC001] hydrometric gauge photo from May 6 at 8:00. Photo courtesy of Water Survey of Canada and GNWT. This image shows river ice moving downstream past Fort Simpson.

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.

Above average temperatures are expected today and tomorrow for Jean Marie River and Fort Simpson, with 5-10 mm of rain forecasted overnight.



Fort Simpson seven-day weather forecast:

Tue 6 May	Wed 7 May	Thu 8 May	Fri 9 May	Sat 10 May	Sun 11 May	Mon 12 May
16°C Clearing	13°C 60% Chance of showers	9°C Cloudy	18°C Sunny	12°C Sunny	13°C A mix of sun and cloud	12°C A mix of sun and cloud
Tonight	Night	Night	Night	Night	Night	
5°C 60% Chance of showers	-1°C 60% Chance of rain showers or flurries	-3°C Clear	0°C Clear	1°C Cloudy periods	1°C 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

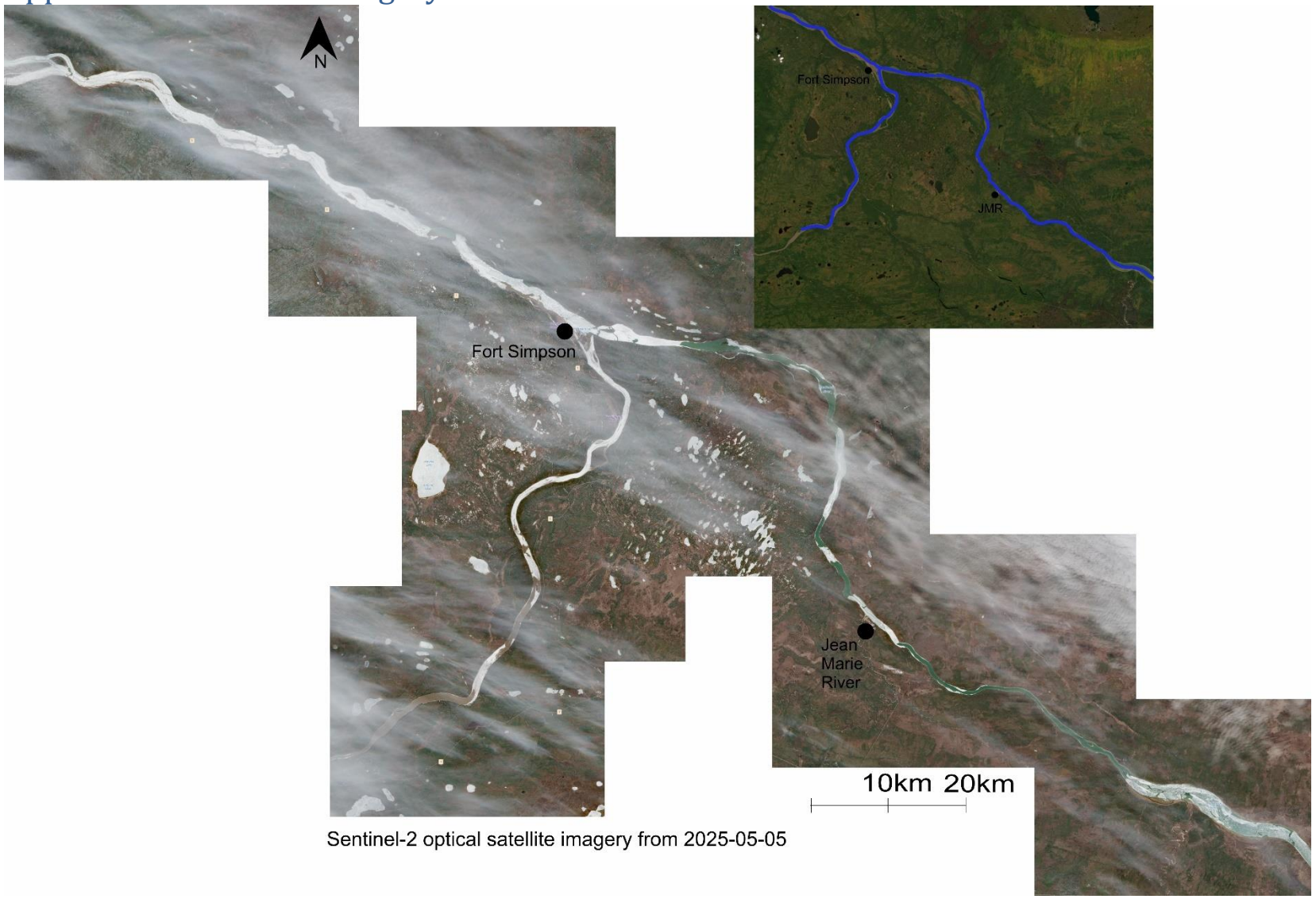
chances of ice jams. If an ice jam occurs, the location of the ice jam is also very important. Each river reach has different locations that are prone to ice jams. The location of the ice jam can be an important factor as to whether or not a community floods. Furthermore, ice will jam and then move again 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.

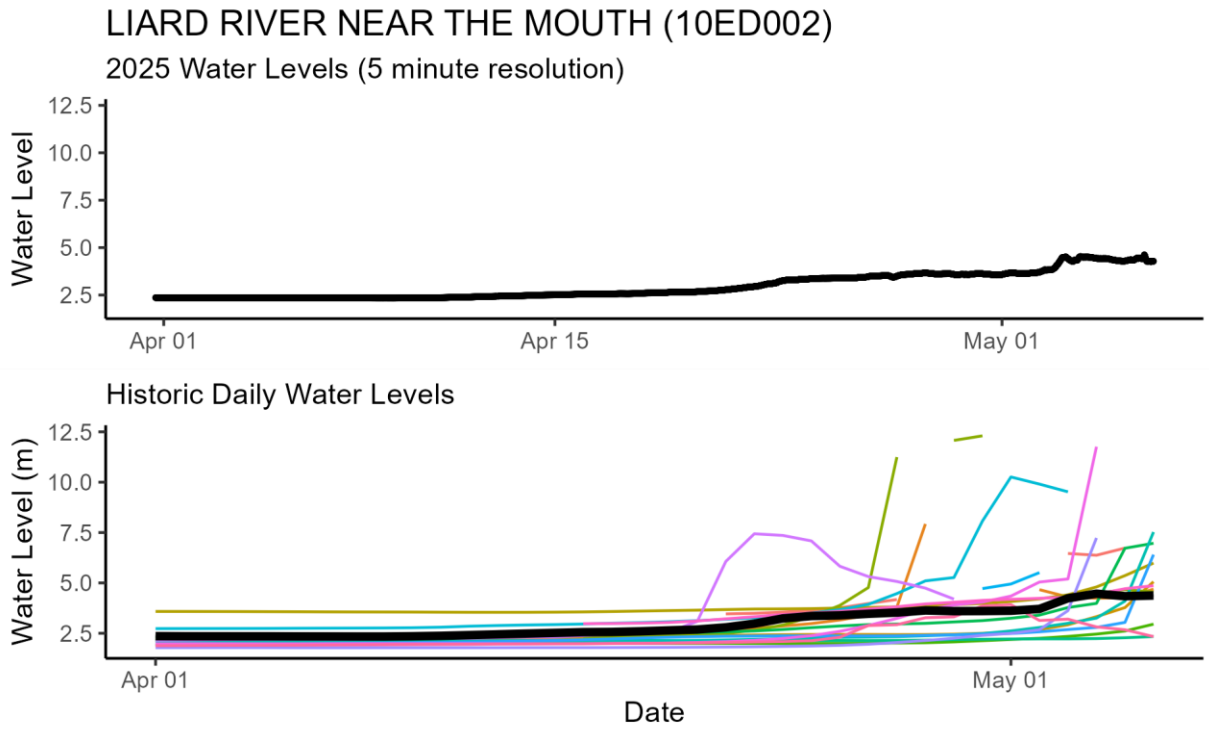
Appendix A: River Ice Imagery



Above – Sentinel-2 optical satellite imagery over the Mackenzie River at the confluence with the Liard River. This image was acquired on 2025-05-05.

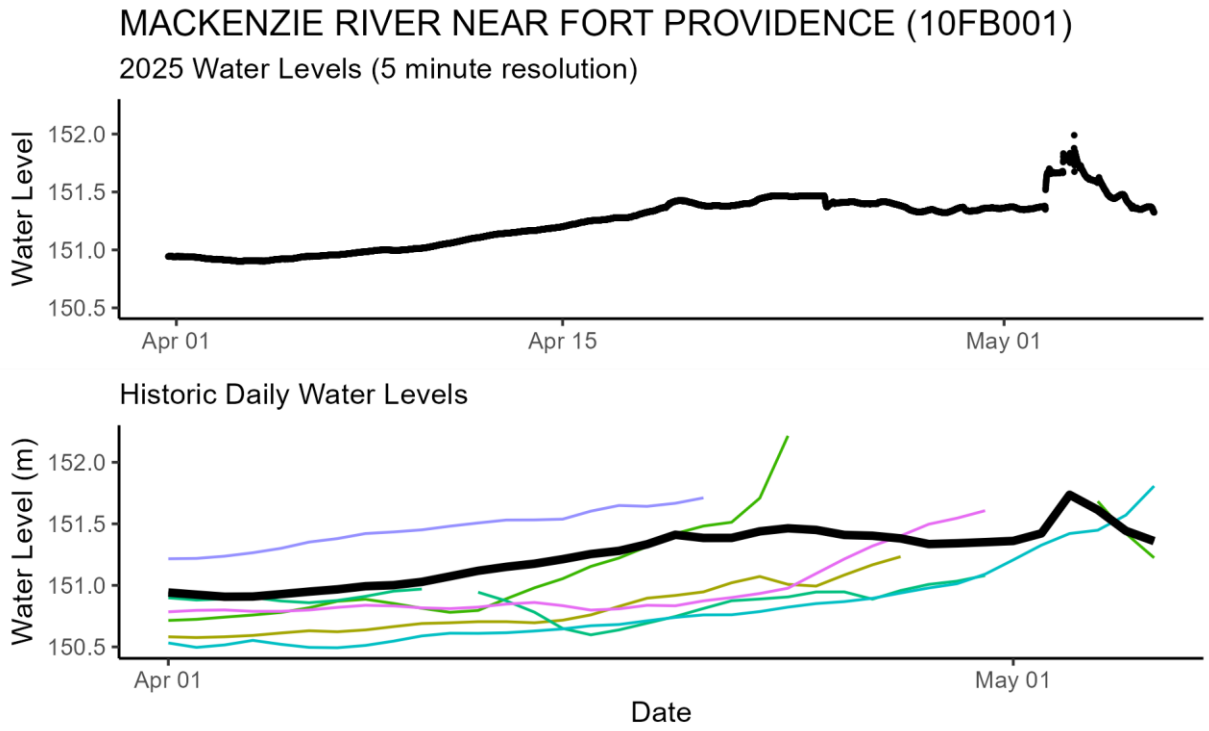
Appendix B: High resolution and historic water level plots

Liard River near the Mouth [10ED002]:



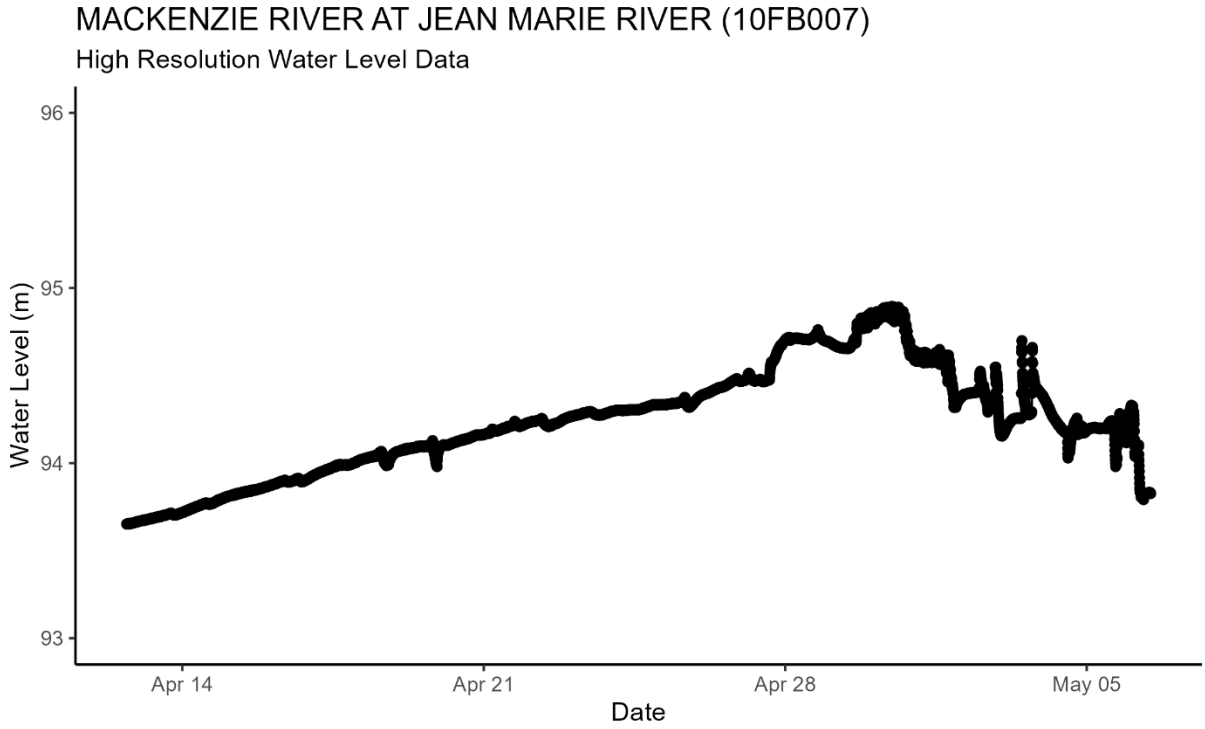
Above - The upper graph in the figure presents real time water level data at 5-minute resolution. The lower graph shows daily average levels relative to the previous 20 years.

Mackenzie River near Fort Providence [10FB001]:



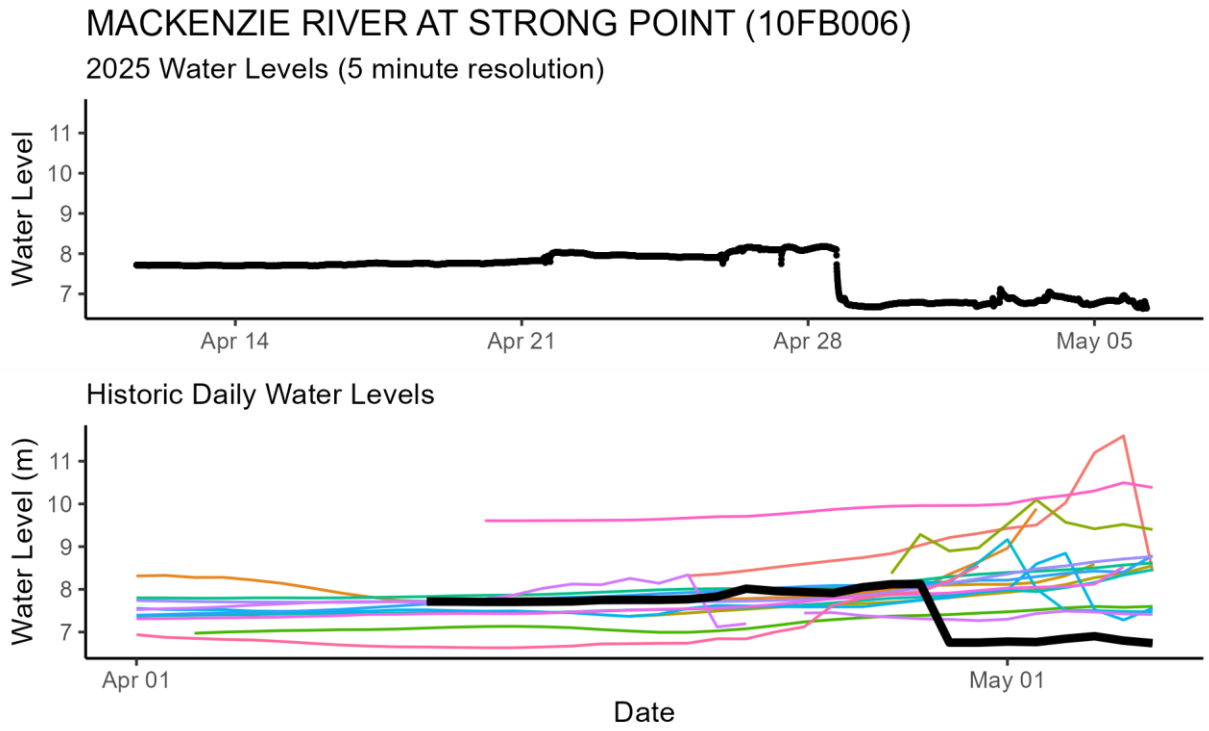
Above - The upper graph in the figure presents real time water level data at 5-minute resolution. The lower graph shows daily average levels relative to the previous 20 years.

Mackenzie River at Jean Marie River [10FB007]:



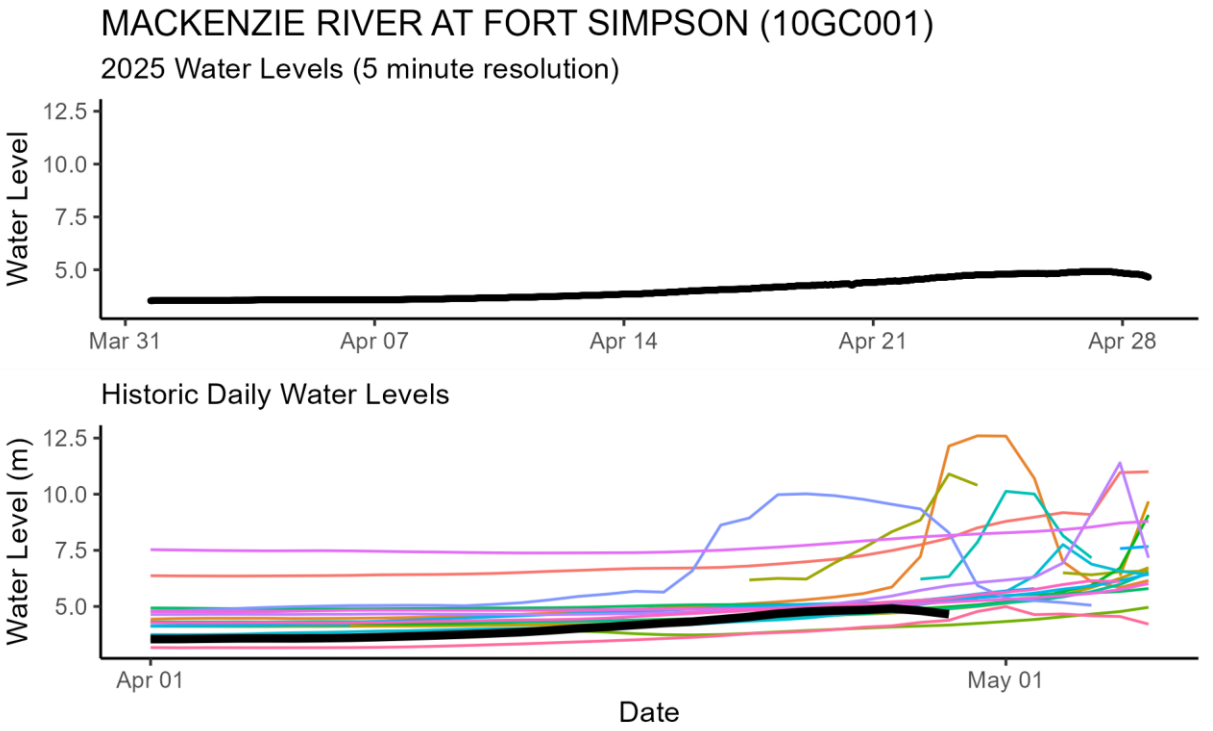
Above - Real time water level data at 5-minute resolution.

Mackenzie River at Strong Point [10FB006]:



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 Fort Simpson [10GC001]:



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.