Government of
Northwest Territories

NWT Water Monitoring Bulletin – April 24, 2025 at 16:00

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.

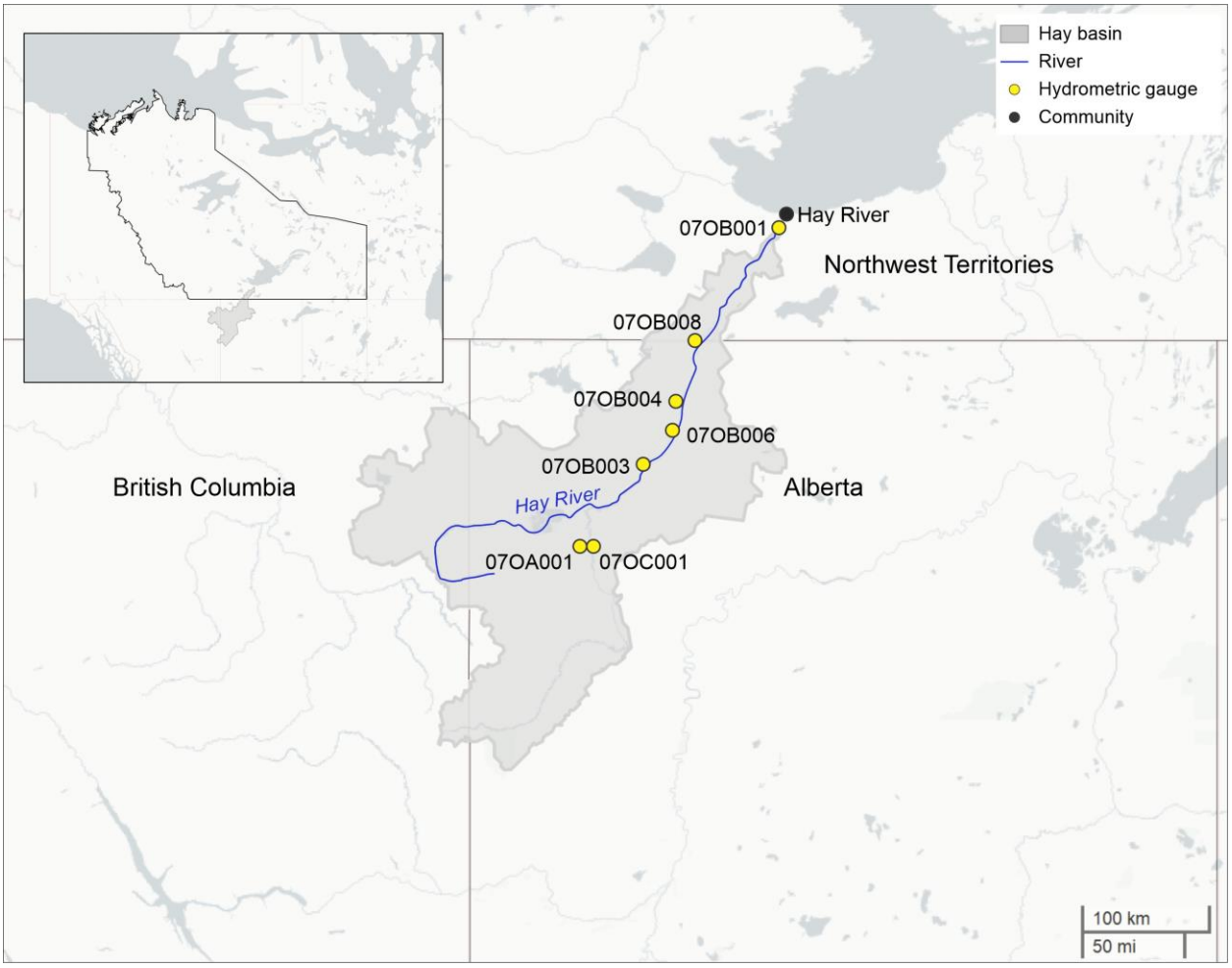
Current Status:

- Relatively cool and cloudy conditions across the southern NWT have limited the progression of break-up since the last report on April 19.
- Break-up along the Hay River continues to be thermal (ice is primarily melting in place);
    - Open water sections are growing near the NWT-AB border. River ice near the town of Hay River remains intact.
    - Water level increases on the Hay River near the NWT-AB border remain relatively small.
- Break-up along the Liard River has also been primarily thermal;
    - Open water sections are growing along the riverbanks and between Fort Liard and Nahanni Butte.
    - Water levels are continuing to rise under ice on the Liard River, but the rates of increase are small.
- River ice has started to move in small sections along the Mackenzie River between Fort Providence and Jean Marie River.
    - Water levels are slowly rising under the ice on the Mackenzie River at Fort Simpson and are normal for this time of year.
    - River ice remains mostly intact at Jean Marie River and Fort Simpson.

Hay River:

Current Status:

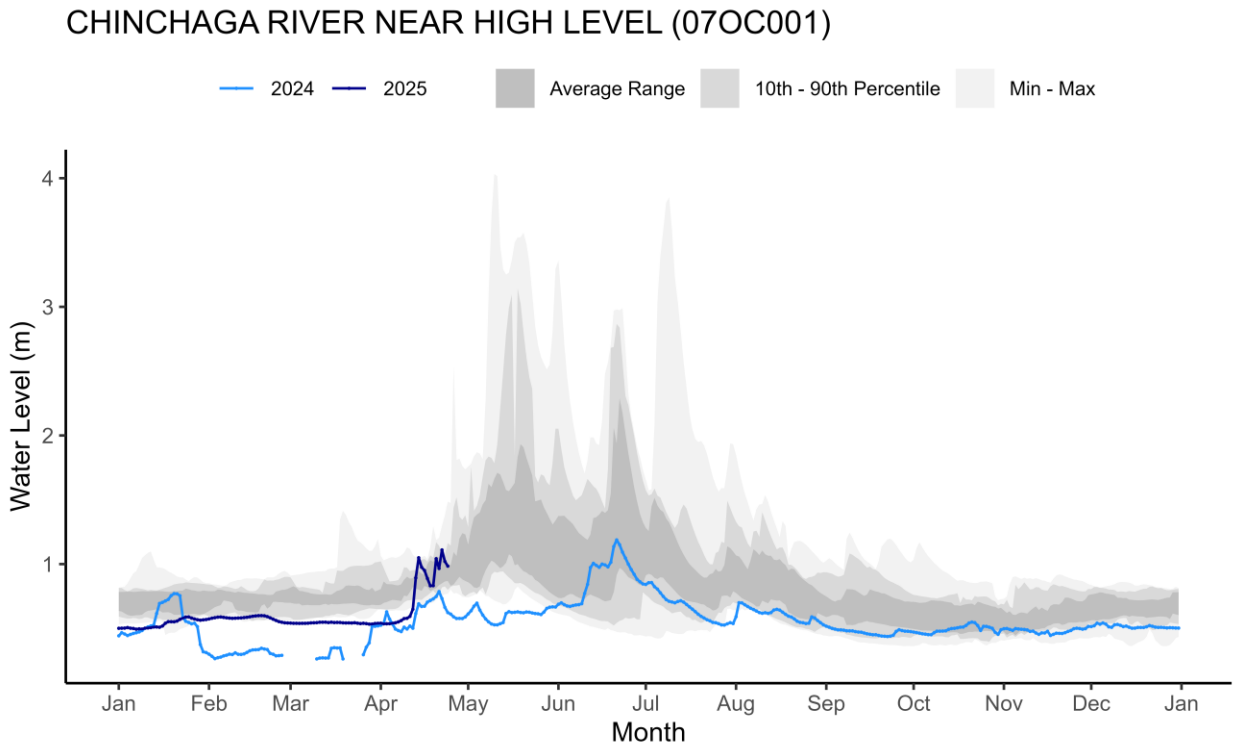
- Ice is continuing to degrade thermally along the Hay River.
    - Near the Alberta/NWT border, open water sections are growing, and some ice movement has been observed. River ice is mostly intact near the town of Hay River.
    - River ice continues to push through on the Hay River at Meander River, which is approximately 100 km upstream of the Alberta/NWT border.
    - River ice continues to move along the Chinchaga River, the southern tributary to the Hay River.
    - Forecasted weather over the rest of the week and into the weekend should moderate further melt of snow and river ice.
- Water levels continue to slowly rise along the Hay River and its tributaries and are normal for this time of year.
- After a brief period of early season warm temperatures, recent air temperatures have been fluctuating around 0˚C.
- Temperatures in the Hay River basin are expected to be average to below average for the rest of this week and into the weekend, with temperatures continuing to fluctuate around 0°C.
- Refer to the Town of Hay River website for the most up-to-date information, as well as webcam images of current conditions.



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

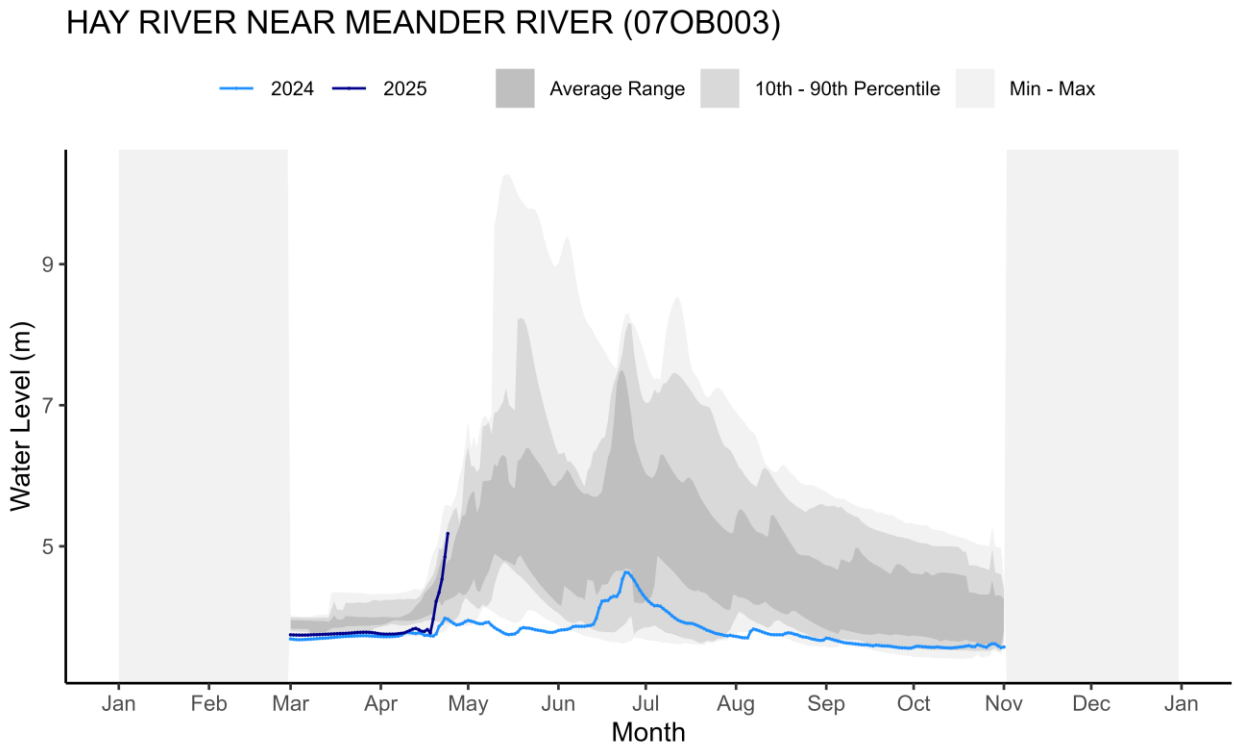
Hydrometric Data:

Chinchaga River near High Level (Alberta) [07OC001]:



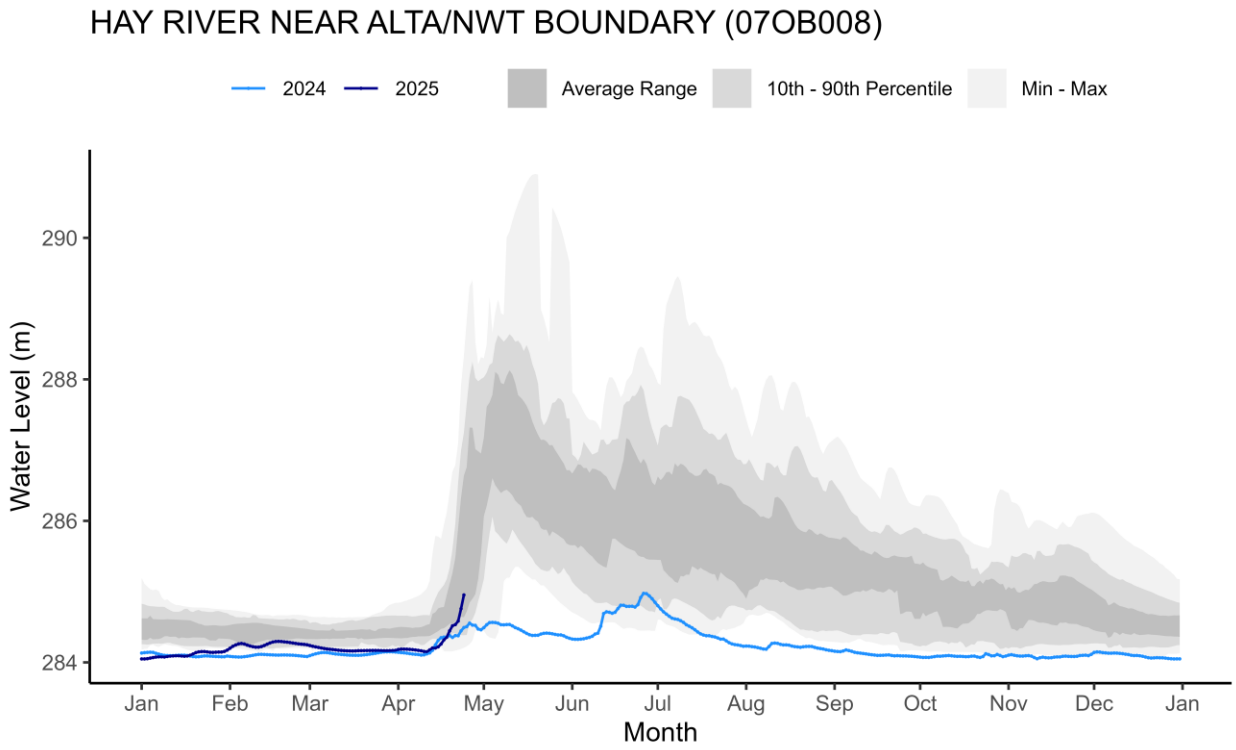
Above – Water level data for the Chinchaga River near High Level. Daily average levels for the previous year are also shown here.

Hay River near Meander River (Alberta) [07OB003]:



Above – Water level data on the Hay River near Meander River, AB. Daily average levels for the previous year are also shown here. This gauge is operated seasonally from March to November.

Hay River near the border [07OB008]:



Above – Water level data for the Hay River near the Alberta- NWT border. Daily average levels for the previous year are also shown here.

Gauge photos:

Hay River near the border [07OB008]:

Above – Hay River near the border hydrometric gauge photo on April 24 at 15:00. Photo courtesy of Water Survey of Canada and GNWT.

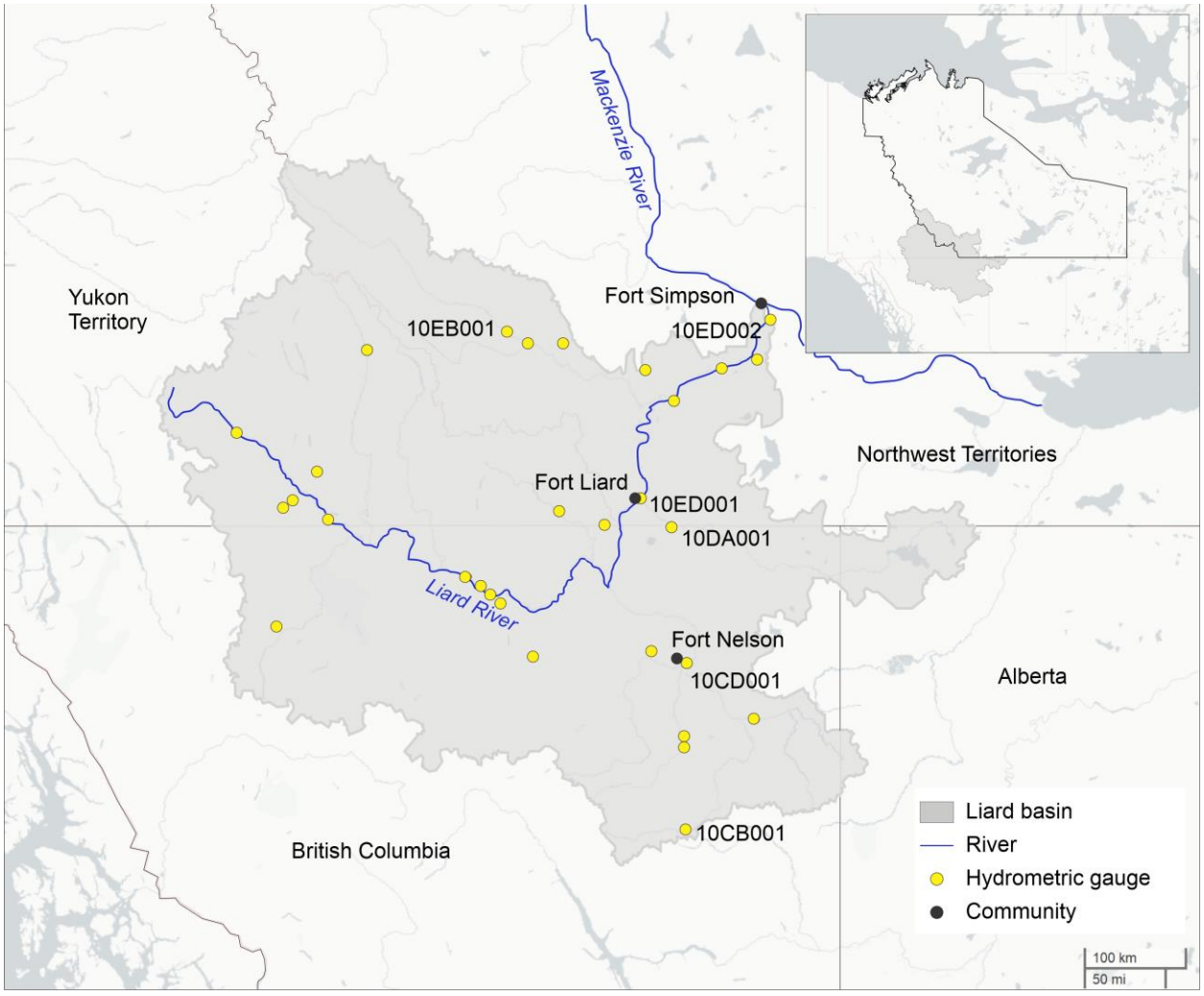
Hay River near Hay River [07OB001]:

Above – Hay River near the Town of Hay River hydrometric gauge photo on April 24 at 15:00. Photo courtesy of Water Survey of Canada and GNWT.

Liard River:

Current Status:

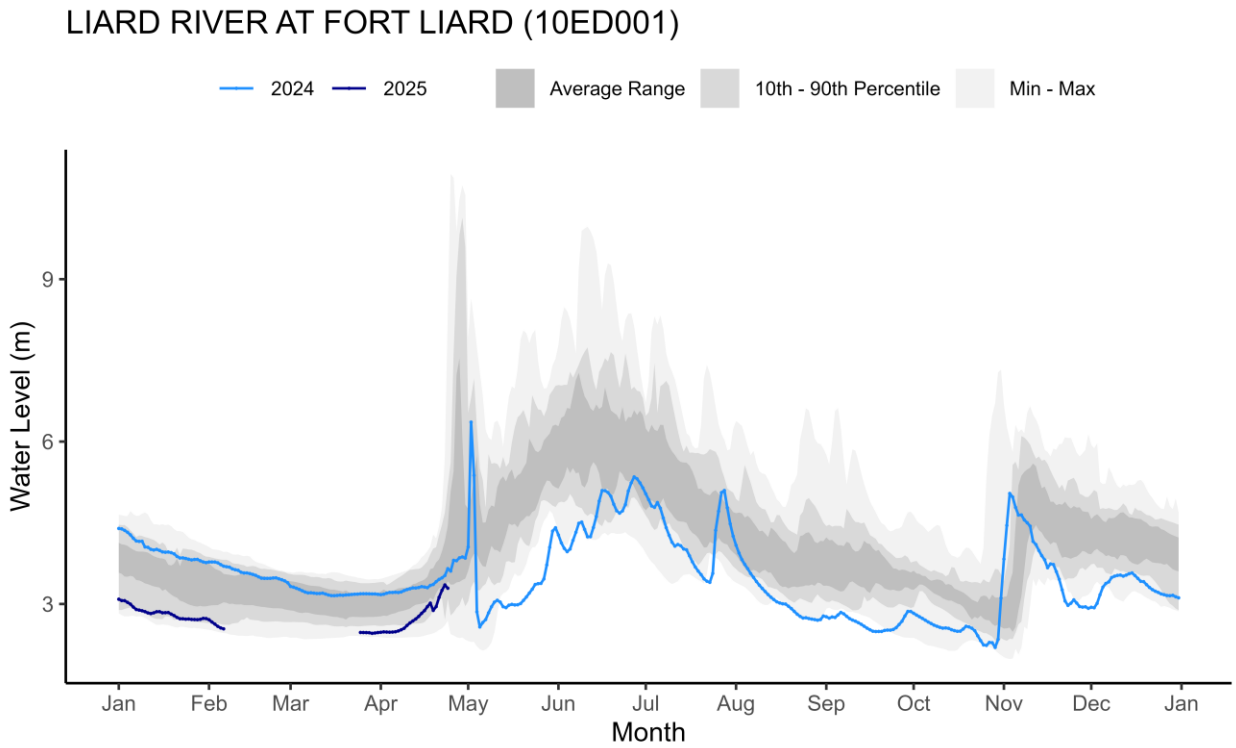
- Ice along the Liard River within the NWT has been degrading thermally;
    - Open water sections have been growing and some ice movement has been observed.
    - Break-up is progressing along the Petitot River, a tributary to the Liard River at Fort Liard.
- Water levels have started to slowly increase underneath the ice on the Liard River.
- Temperatures across the lower Liard River basin are expected to be average to above average over the rest of the week and into the weekend, with a chance of showers tomorrow.



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 at Fort Liard [10ED001]:



Above – Water level data for the Liard River at Fort Liard. Daily average levels for the previous year are also shown here.

Gauge photos:

Liard River at Fort Liard [10ED001]:

Above – Liard River at Fort Liard hydrometric gauge photo from April 24 at 15:00. Photo courtesy of Water Survey of Canada and GNWT.

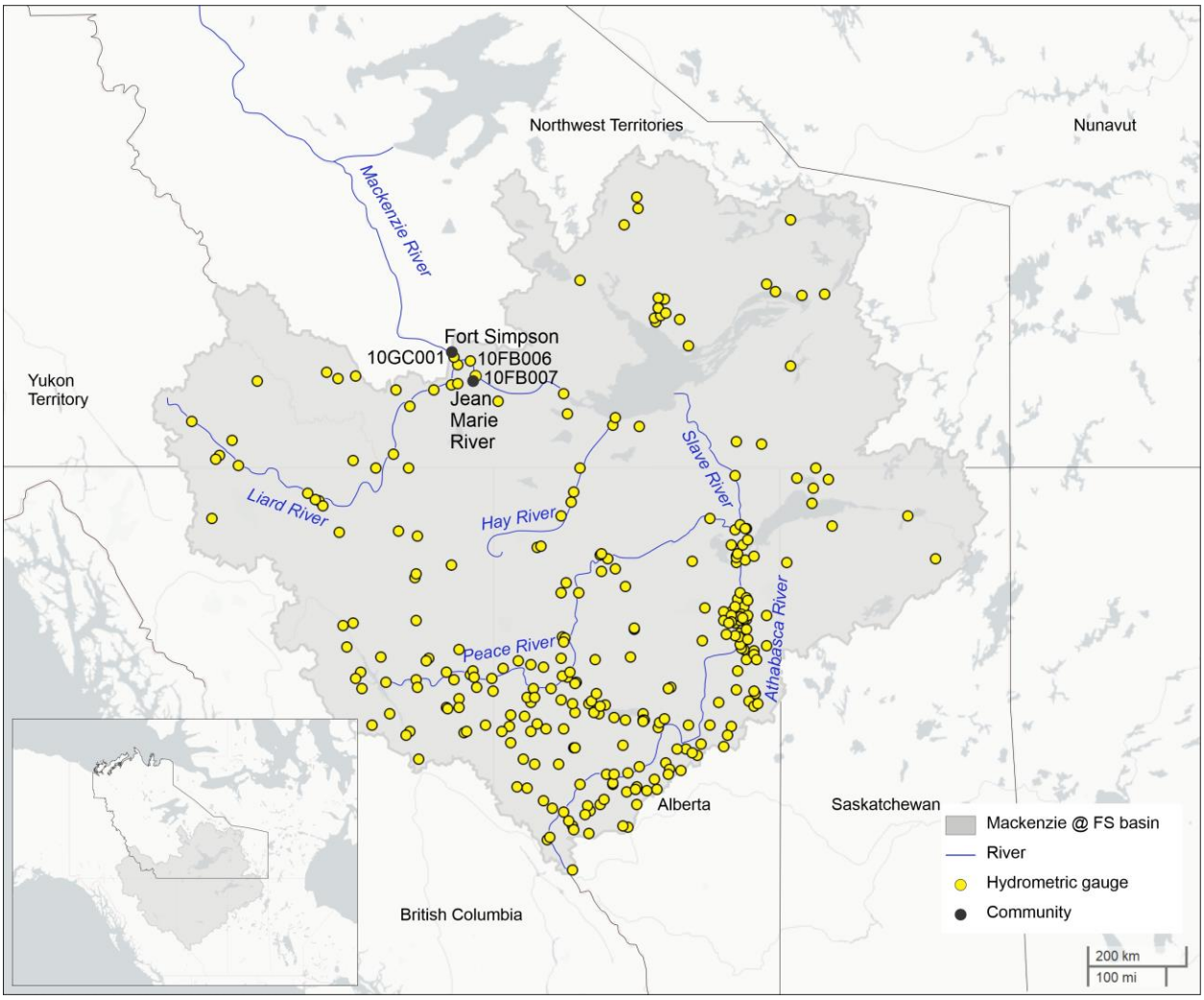
Liard River near the mouth [10ED002]:

Above – Liard River near the mouth hydrometric gauge photo from April 24 at 15:00. Photo courtesy of Water Survey of Canada and GNWT.

Mackenzie River:

Current Status:

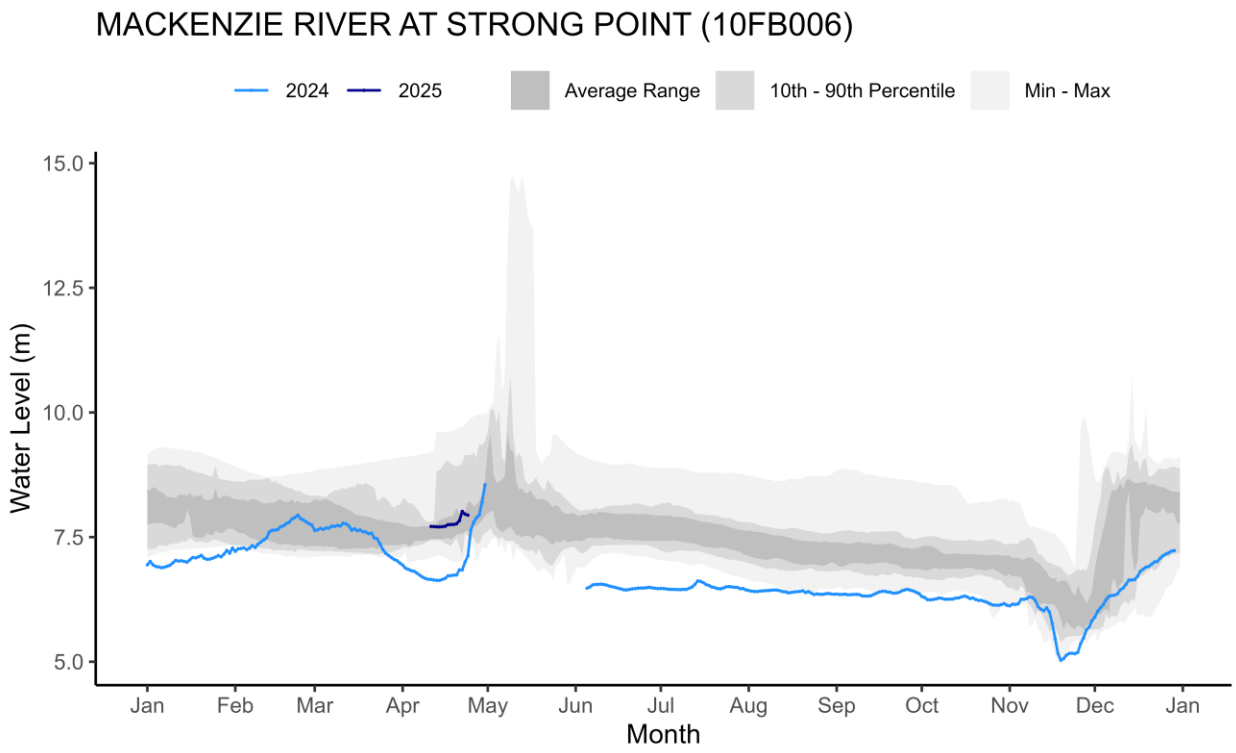
- Early season snowmelt has been substantial in the Dehcho region;
  - This is largely due to above average temperatures in early April.
- Ice has started to move through the upper Mackenzie River.
  - Open water sections have been observed between Jean Marie River and Fort Providence.
  - Ice remains largely intact at Fort Simpson.
- Water levels have been slowly rising underneath the ice at Fort Simpson
- Temperatures are expected to be below average throughout the rest of the week and into the weekend, and a mixture of snow and rain showers is expected over the weekend.



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

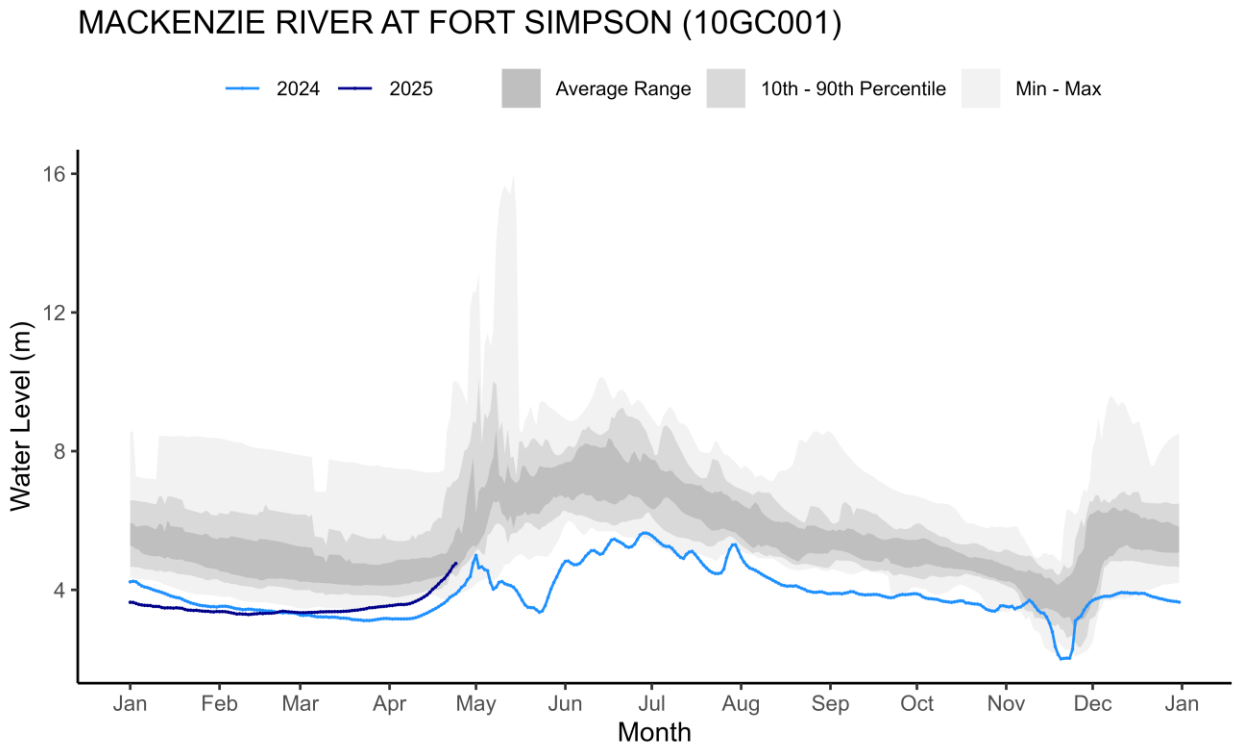
Hydrometric Data:

Mackenzie River at Strong Point [10FB006]:



Above – Water level data for the Mackenzie River at Strong Point. Daily average levels for the previous year are also shown here.

Mackenzie River at Fort Simpson [10GC001]:



Above – Water level data for the Mackenzie River at Fort Simpson. Data for the previous year are also shown here.

Gauge photos:

Mackenzie River at Strong Point [10FB006]:

Above – Mackenzie River at Strong Point hydrometric gauge photo from April 24 at 15:00. Photo courtesy of Water Survey of Canada and GNWT.

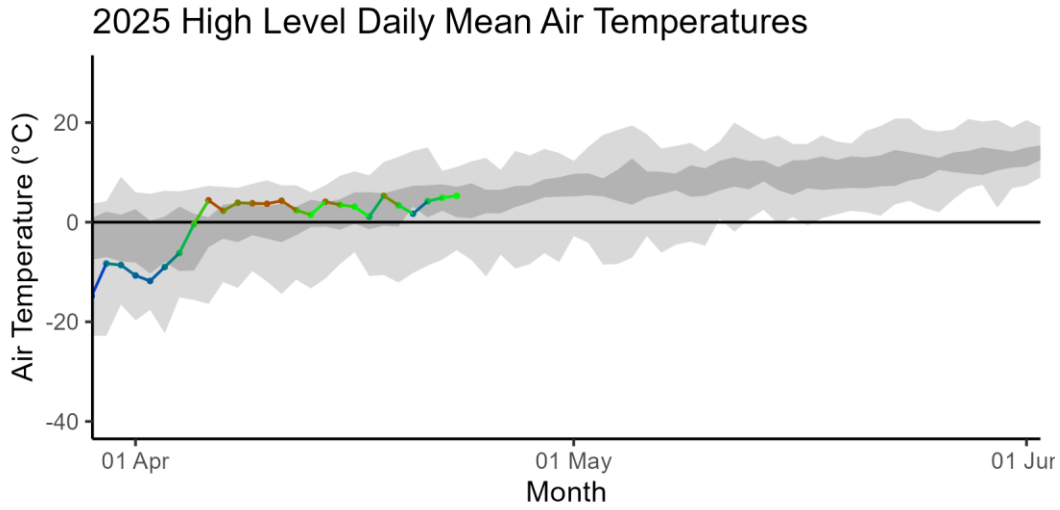
Mackenzie River at Fort Simpson [10GC001]:

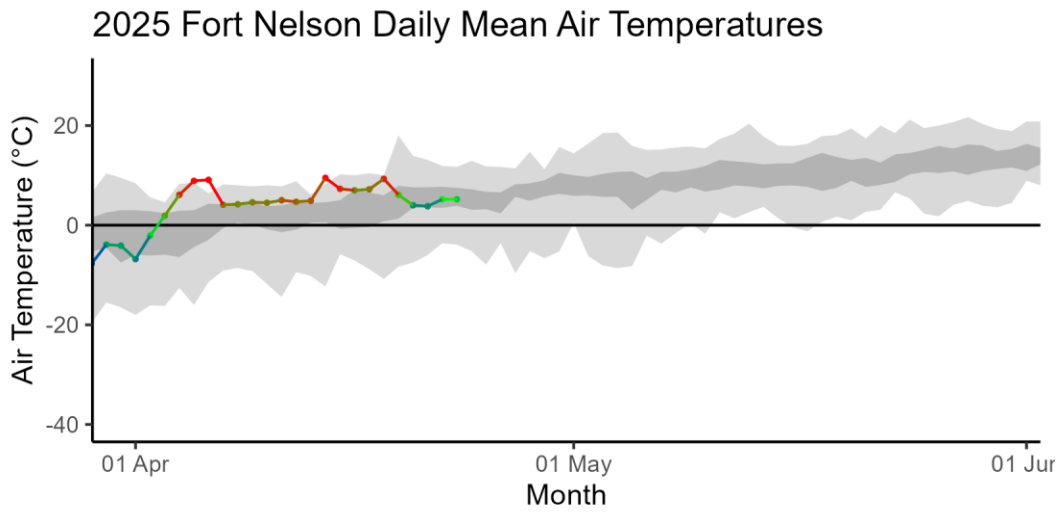
Above – Mackenzie River at Fort Simpson hydrometric gauge photo from April 24 at 15:00. Photo provided by GNWT.

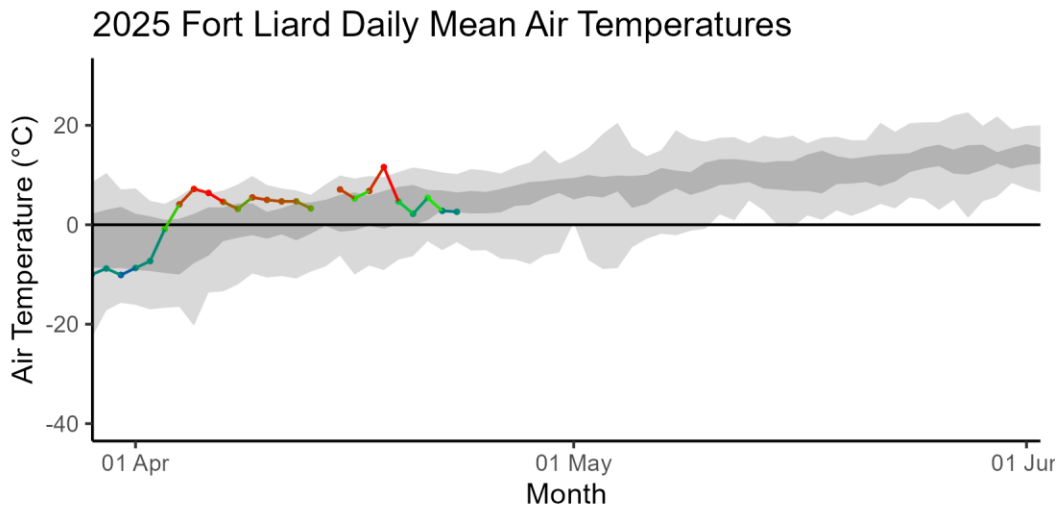
Weather Data:

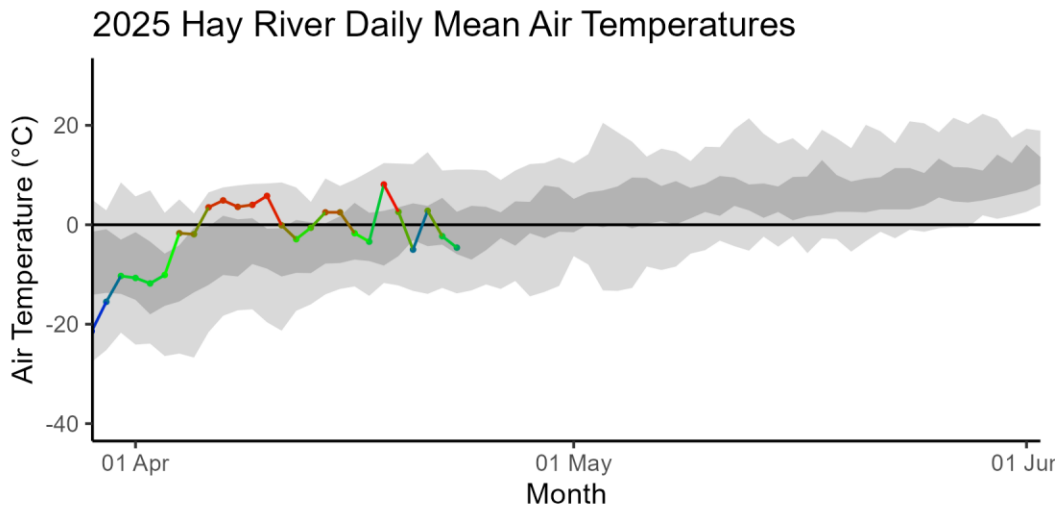
Weather information informs how snow and ice will melt and provides information about how this spring is unfolding relative to previous springs. Warmer than normal conditions early in the spring allow for additional energy to melt the snowpack and soften river ice. Rain-on-snow events can cause rapid 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.

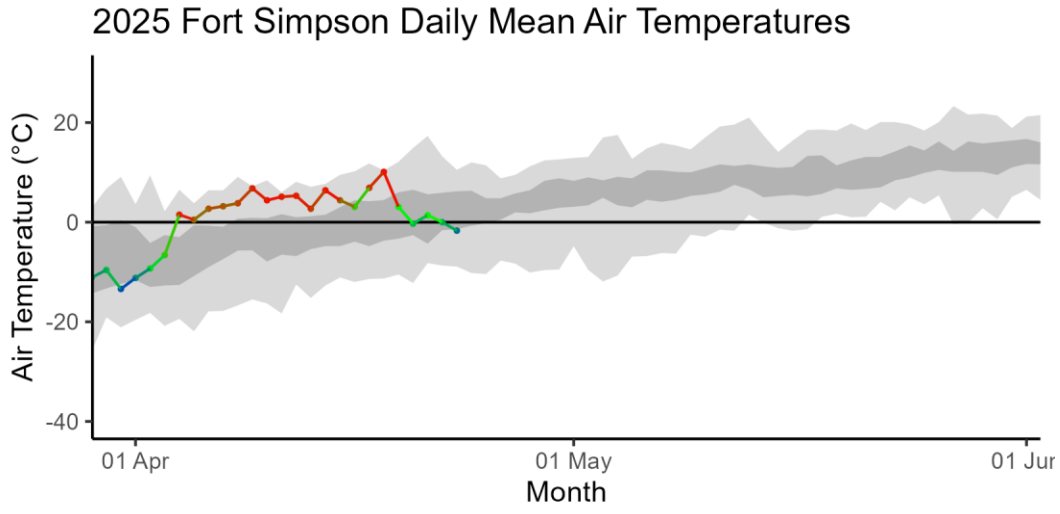
The Hay River basin and the Fort Simpson area are forecast to see average to below average temperatures this weekend. Rain showers and/or snow are expected Friday evening in Hay River, and a mixture of snow and rain showers is expected in Fort Simpson over the weekend.






2025 Fort Liard Daily Mean Air Temperatures
Air Temperature (°C)
20
0
-20
-40
01 Apr
01 May
01 Jun
Month


2025 Hay River Daily Mean Air Temperatures
Air Temperature (°C)
20
0
-20
-40
01 Apr
01 May
01 Jun
Month


2025 Fort Simpson Daily Mean Air Temperatures
Air Temperature (°C)
20
0
-20
-40
01 Apr
01 May
01 Jun
Month

High Level seven-day weather forecast:

Thu 24 Apr	Fri 25 Apr	Sat 26 Apr	Sun 27 Apr	Mon 28 Apr	Tue 29 Apr	Wed 30 Apr
 14°C 30% Chance of rain showers or flurries	 18°C 30% Chance of showers	 8°C A mix of sun and cloud	 6°C Sunny	 15°C Sunny	 13°C 60% Chance of showers	 14°C A mix of sun and cloud
Tonight	**Night**	**Night**	**Night**	**Night**	**Night**	
 3°C Partly cloudy	 2°C 60% Chance of showers	 -7°C Clear	 -4°C Clear	 3°C Cloudy	 -1°C Cloudy periods	

Fort Nelson seven-day weather forecast:

Thu 24 Apr	Fri 25 Apr	Sat 26 Apr	Sun 27 Apr	Mon 28 Apr	Tue 29 Apr	Wed 30 Apr
 13°C Mainly cloudy	 11°C 60% Chance of showers	 8°C A mix of sun and cloud	 12°C Sunny	 16°C Sunny	 11°C 30% Chance of showers	 13°C A mix of sun and cloud
Tonight	**Night**	**Night**	**Night**	**Night**	**Night**	
 0°C Partly cloudy	 -1°C 60% Chance of showers	 -5°C Cloudy periods	 -1°C Clear	 3°C 30% Chance of showers	 2°C Cloudy periods	

Fort Liard seven-day weather forecast:

Thu 24 Apr	Fri 25 Apr	Sat 26 Apr	Sun 27 Apr	Mon 28 Apr	Tue 29 Apr	Wed 30 Apr
 8°C Periods of light snow	 5°C Rain	 2°C Cloudy	 9°C Sunny	 16°C Sunny	 10°C 30% Chance of rain showers or flurries	 11°C Cloudy
Tonight	**Night**	**Night**	**Night**	**Night**	**Night**	
 -2°C A few clouds	 -3°C Cloudy	 -6°C Cloudy periods	 -5°C Clear	 1°C 30% Chance of showers	 -1°C Cloudy	

Hay River seven-day weather forecast:

Thu 24 Apr	Fri 25 Apr	Sat 26 Apr	Sun 27 Apr	Mon 28 Apr	Tue 29 Apr	Wed 30 Apr
-1°C 60% Chance of flurries	6°C A mix of sun and cloud	-5°C Periods of snow	-5°C A mix of sun and cloud	12°C Sunny	4°C 30% Chance of flurries or rain showers	2°C A mix of sun and cloud
Tonight	**Night**	**Night**	**Night**	**Night**	**Night**	
-2°C Mainly cloudy	-7°C Rain showers or flurries	-12°C Cloudy	-10°C Clear	-1°C Cloudy	-5°C Cloudy periods	

Fort Simpson seven-day weather forecast:

Thu 24 Apr	Fri 25 Apr	Sat 26 Apr	Sun 27 Apr	Mon 28 Apr	Tue 29 Apr	Wed 30 Apr
2°C 60% Chance of flurries	3°C Snow or rain	-2°C Periods of snow	2°C A mix of sun and cloud	10°C Sunny	3°C 60% Chance of flurries	4°C A mix of sun and cloud
Tonight	**Night**	**Night**	**Night**	**Night**	**Night**	
-3°C Partly cloudy	-7°C Rain or snow	-13°C Clear	-6°C Clear	-2°C 60% Chance of rain showers or flurries	-6°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. When this happens, the pieces of floating ice jam on the solid ice and 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

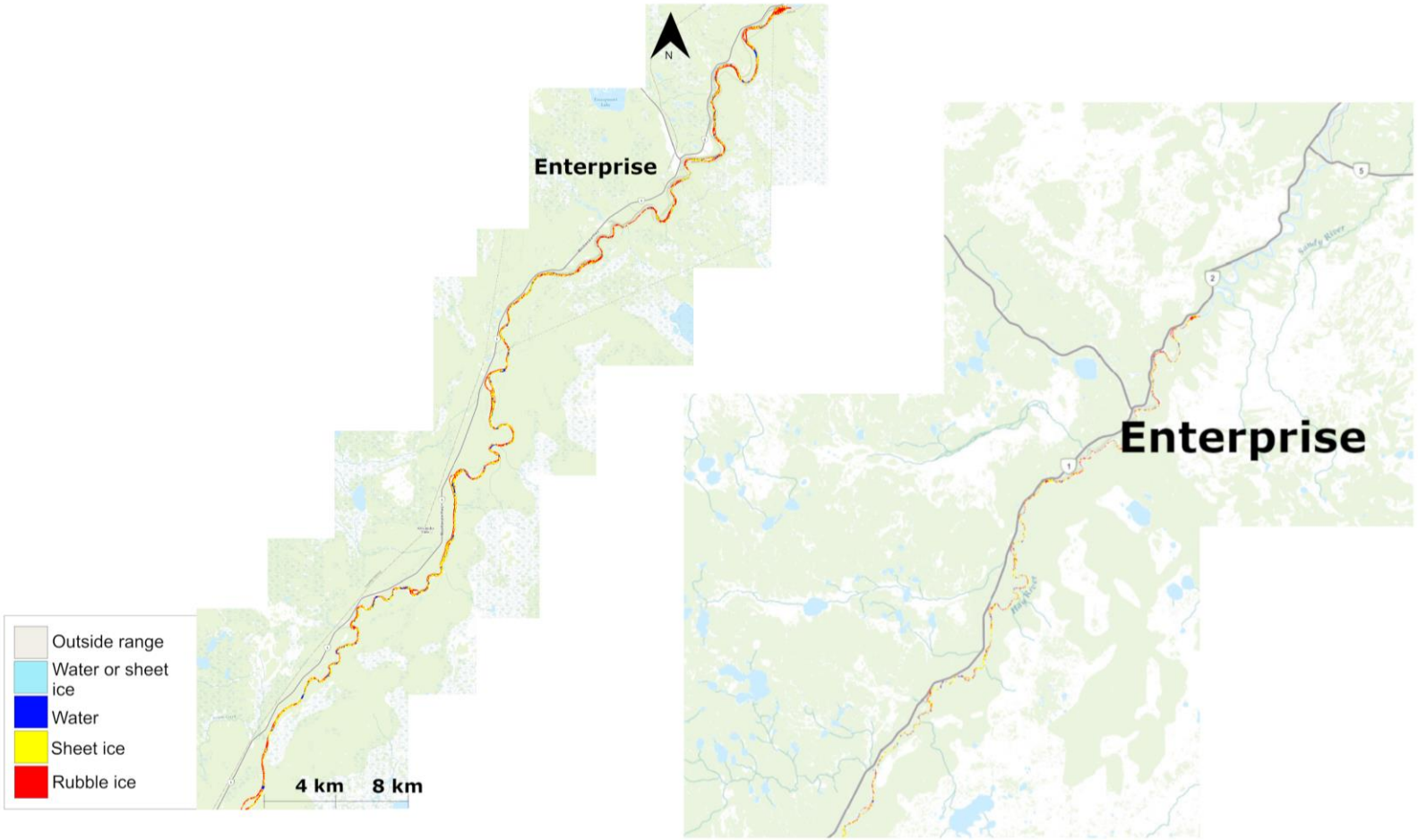
river reach has different locations that are prone to ice jams. The location of the ice jam can be an important factor as to whether or not a community floods. Furthermore, ice will jam and then move again at multiple locations along a river as break-up progresses downstream. The timing and location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

Technical Note:

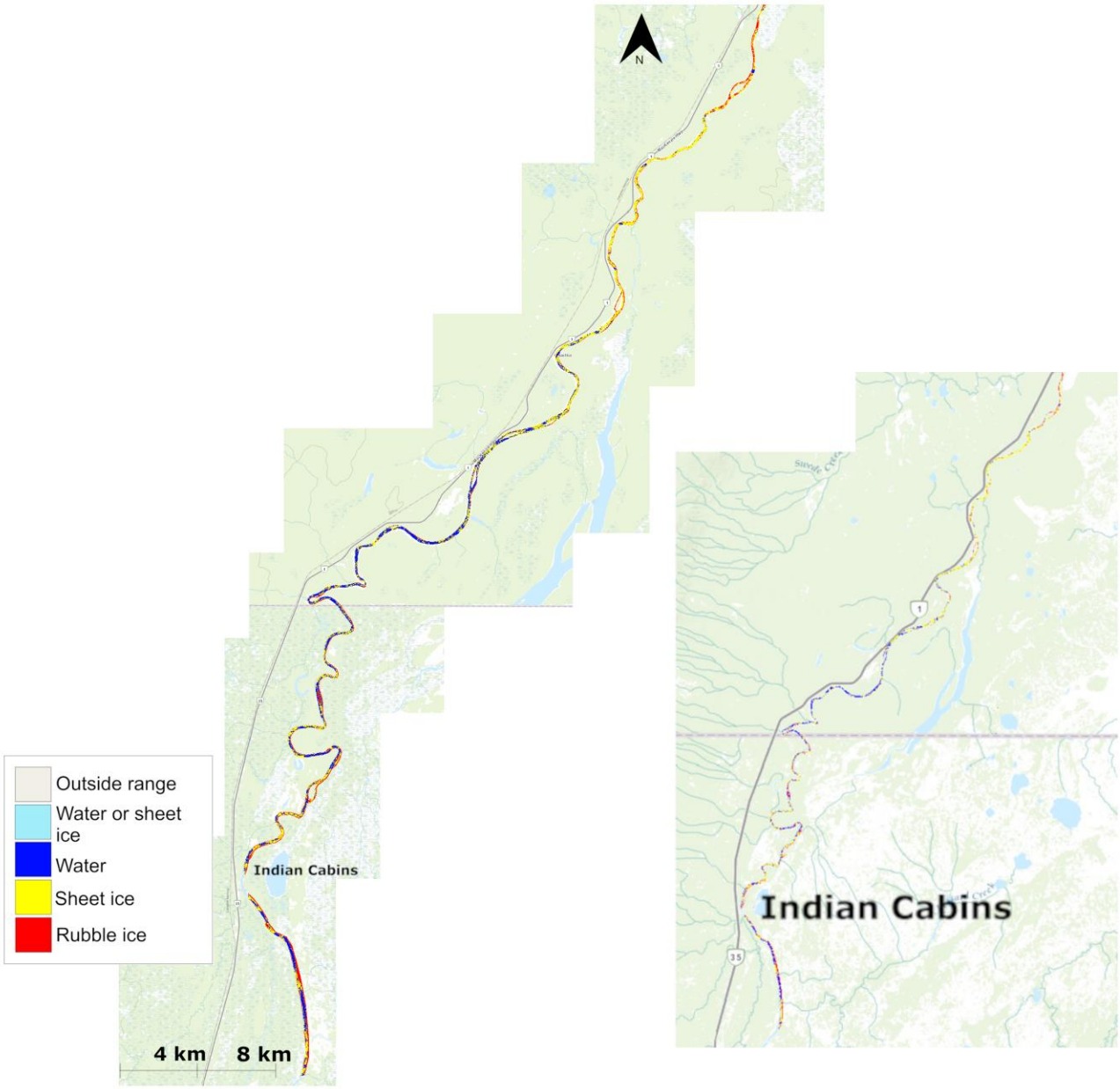
- The figures in this report plot water levels. The values on the y-axis are (in most cases) relative to an arbitrary datum. This means that the values on each gauge can be compared to different years but should not be used to compare water levels from one location to the next.

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



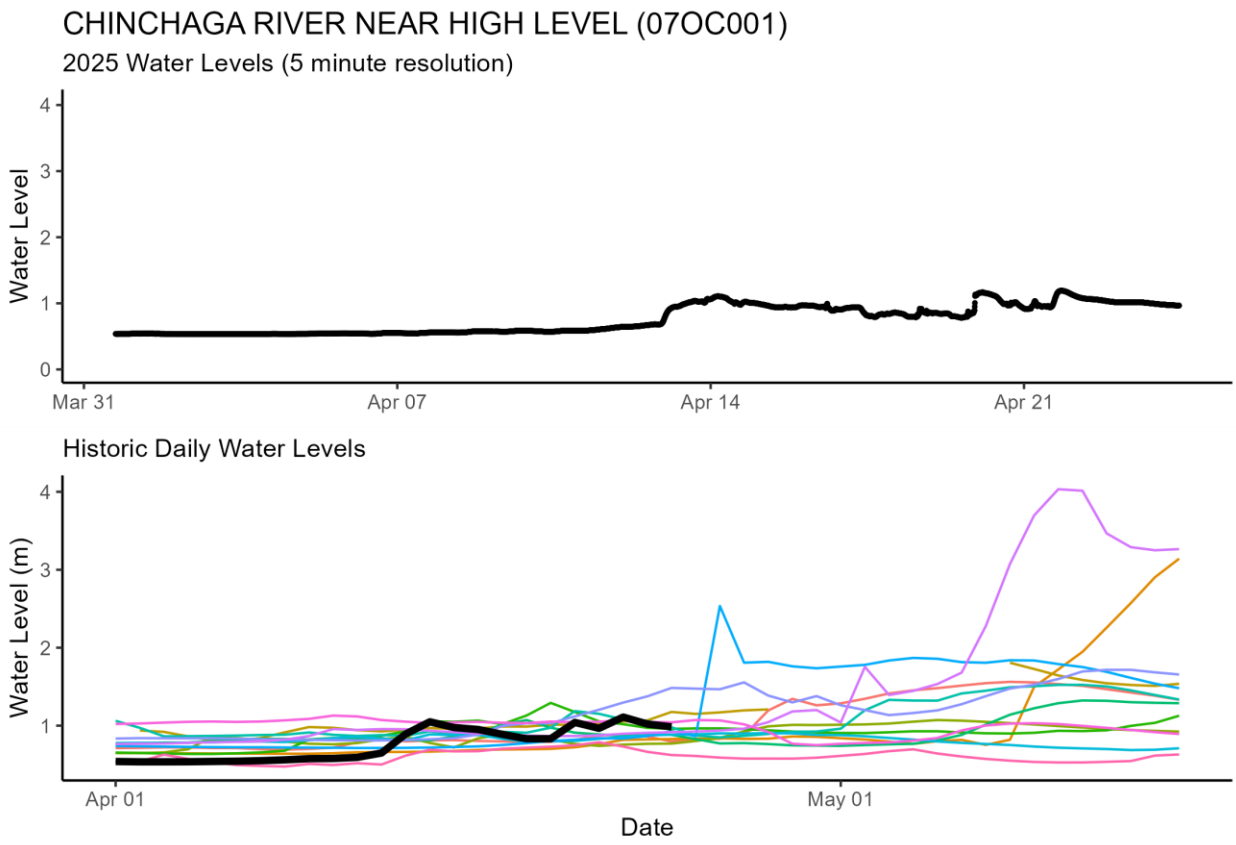
Above – Classified river ice image of the Hay River near Enterprise. The image shows mostly intact sheet ice. The image was acquired last night at 19:29 MDT and is courtesy of the federal government's Government Operations Centre. The river ice classification was completed using the IceBC algorithm.



Above – Classified river ice image of the Hay River near the AB/NWT border. The image shows several open water sections in dark blue. The image was acquired this morning at 08:05 MDT and is courtesy of the federal government's Government Operations Centre. The river ice classification was completed using the IceBC algorithm.

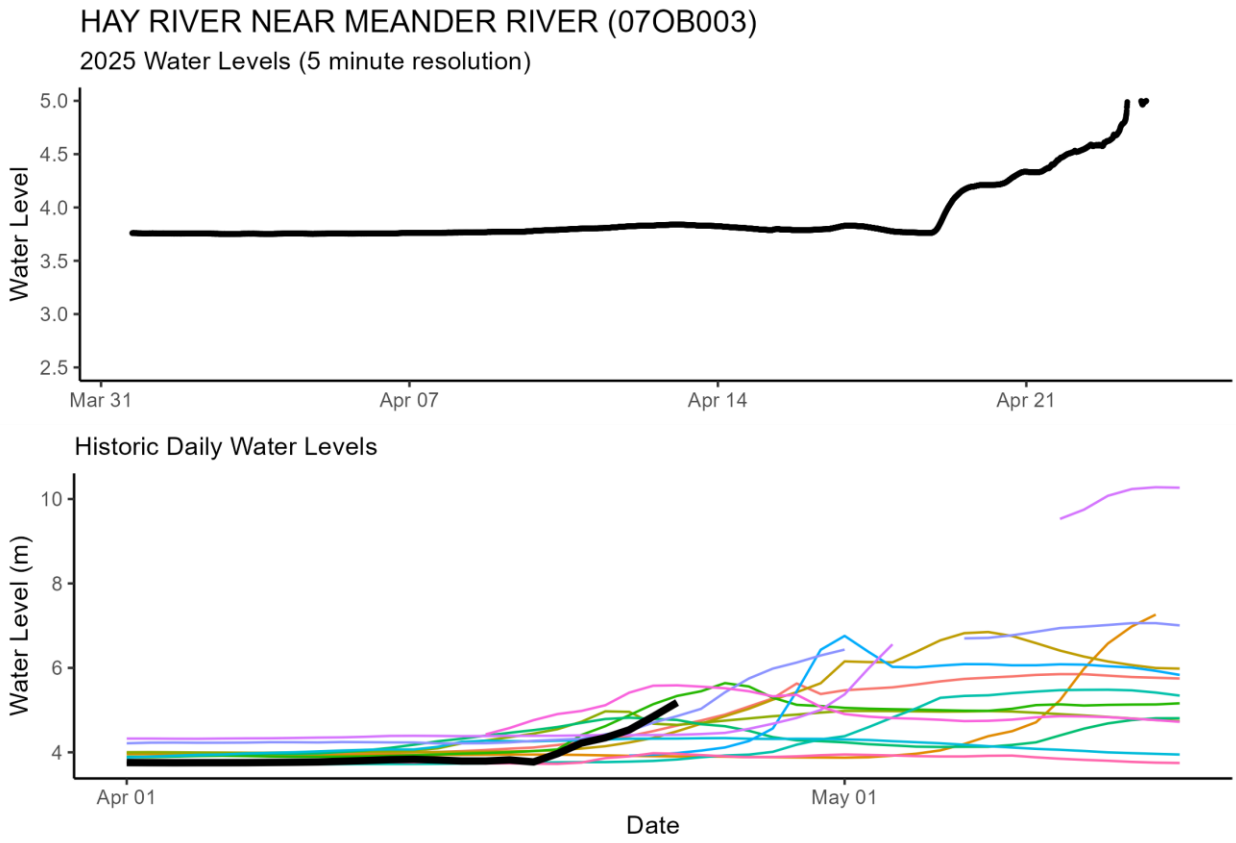
Appendix B: High resolution and historic water level plots

Chinchaga River near High Level (Alberta) [07OC001]:



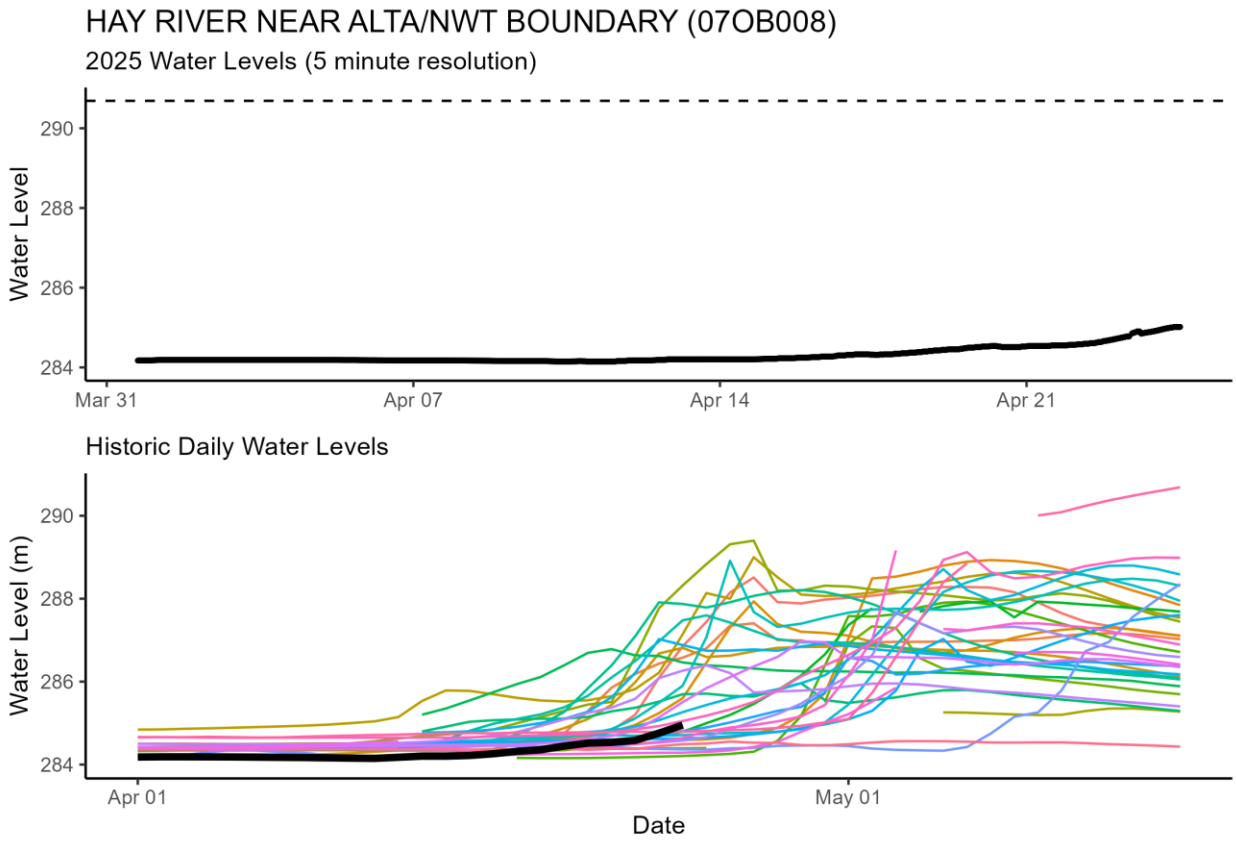
Above – Water level data at the Chinchaga River near High Level, AB. This plot shows high resolution (5 minute) water level data on the top, and daily average data on the bottom.

Hay River near Meander River (Alberta) [07OB003]:



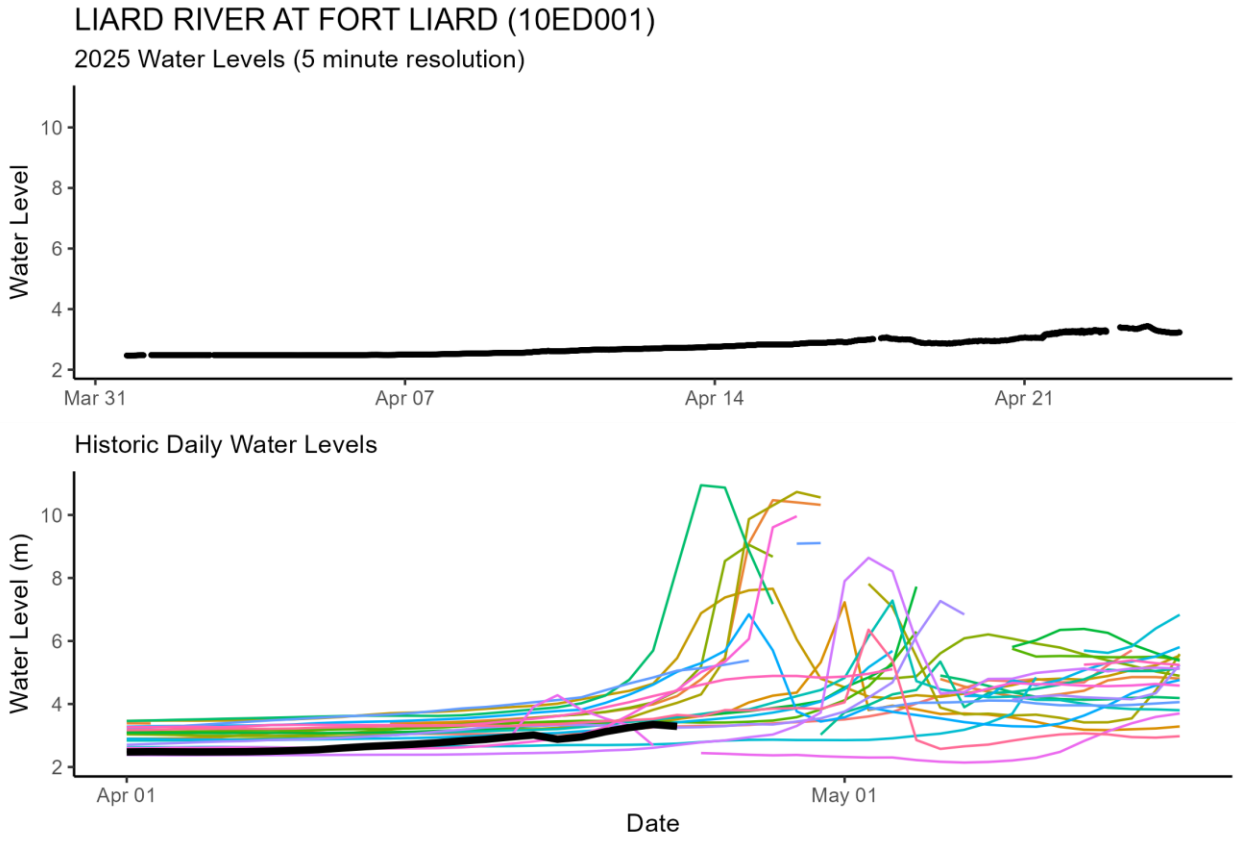
Above – Water level data on the Hay River near Meander River, AB. This plot shows high resolution (5 minute) water level data on the top, and daily average data on the bottom.

Hay River near the border [07OB008]:



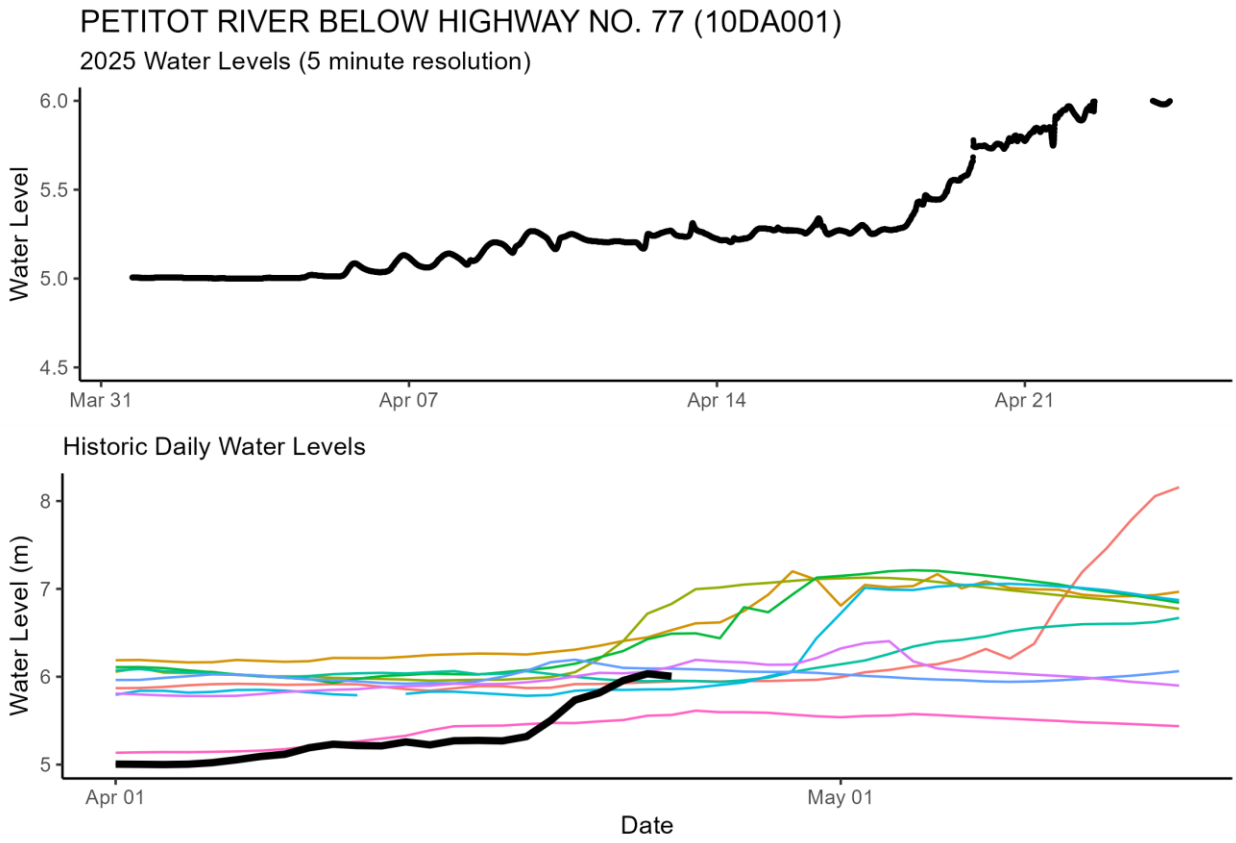
Above - The upper graph in the figure presents real time water level data at 5-minute resolution with the dashed line representing the peak water level from 2022. The lower graph shows daily average levels relative to the previous 20 years.

Liard River at Fort Liard [10ED001]:



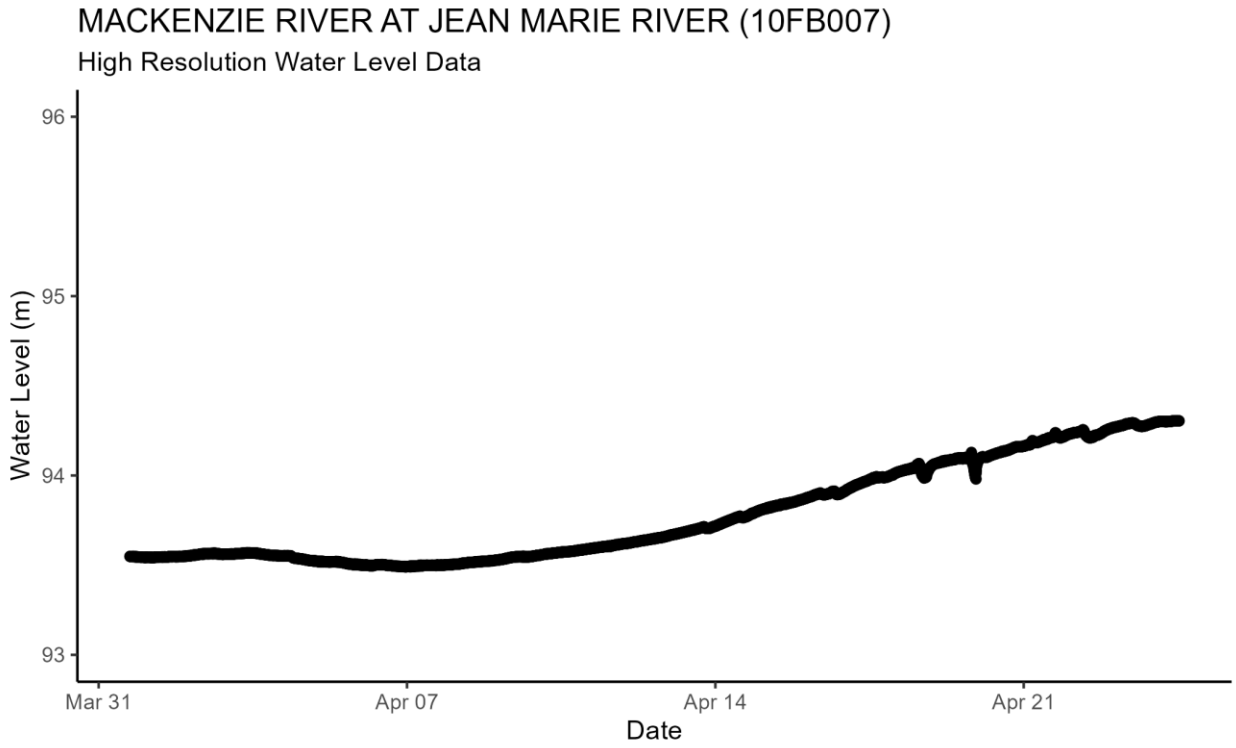
Above - The upper graph in the figure presents real time water level data at 5-minute resolution. The lower graph shows daily average levels relative to the previous 20 years.

Petitot River below highway no. 77 [10DA001]:



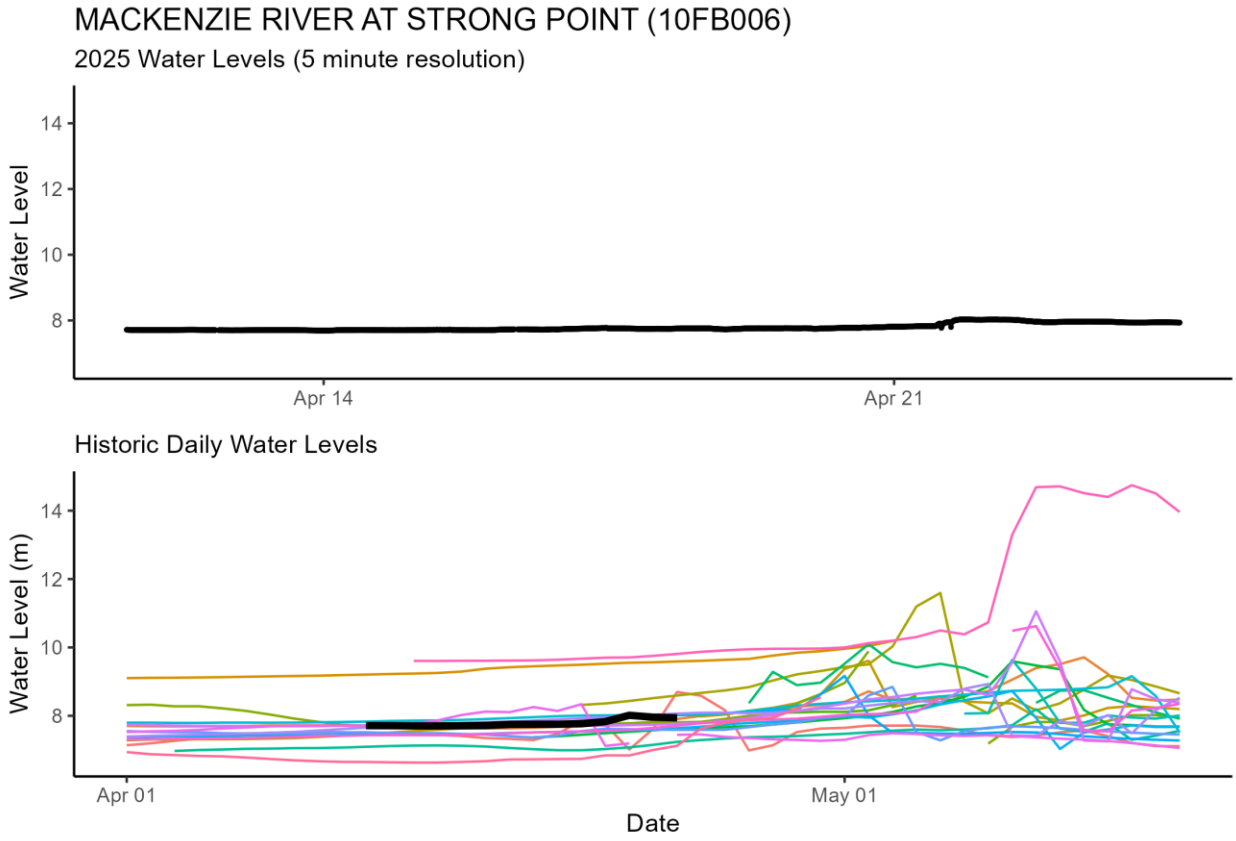
Above - The upper graph in the figure presents real time water level data at 5-minute resolution. The lower graph shows daily average levels relative to the previous 20 years.

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]: