Government of
Northwest Territories

NWT Water Monitoring Bulletin – April 19, 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.

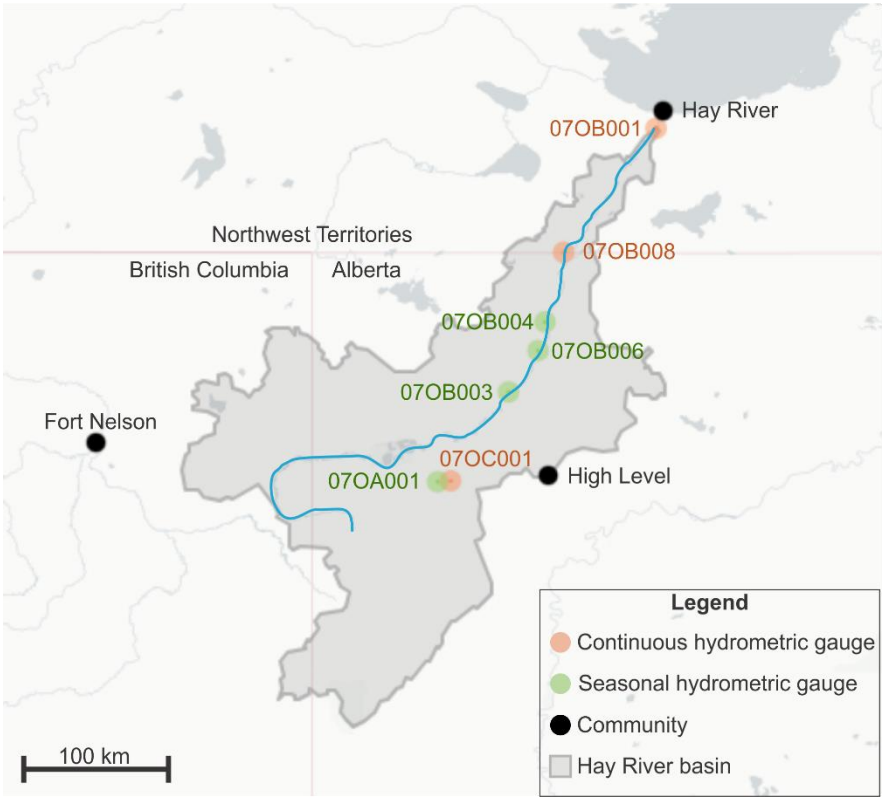
Current Status:

- Break-up along the Hay River is thermal so far (ice is primarily melting in place) and should slowly progress over the next few days;
    - There are some small open water stretches along the river, but river ice has not yet started to move at the Alberta/NWT border.
- Break-up of river ice has not yet started on the Liard River.
    - The Petitot River (tributary to the Liard River at Fort Liard) has started to see ice movement and corresponding rises in water level but rises are relatively small.
- Snowmelt is ongoing in the Hay River basin, with the southern parts of the basin almost snow free;
- Snowmelt in the lower Liard River basin (i.e., the low elevation, non-mountainous part of the basin) is ongoing;
- Water levels are slowly increasing on the Hay River but remain well below normal for this time of year.
- Water levels are slowly beginning to rise under ice on the Liard River, but the rates of increase are very small.

Hay River:

Current Status:

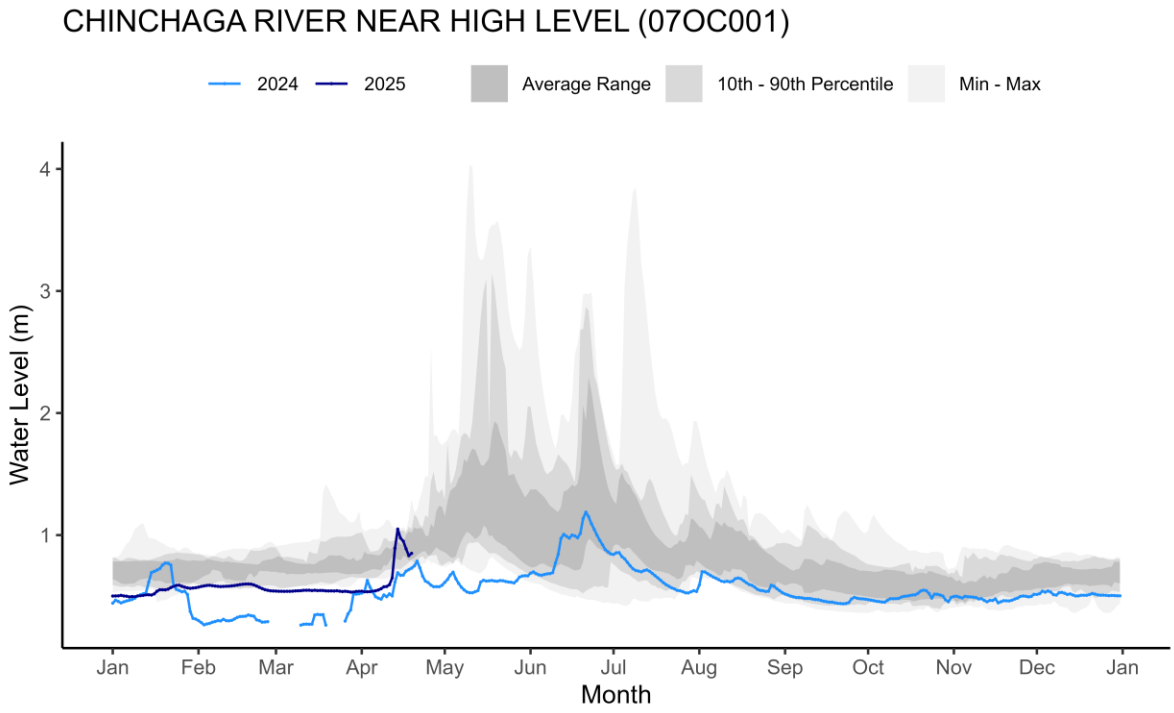
- The snowpack has melted substantially across the basin;
- Ice appears to be degrading thermally along the Hay River:
    - River ice is pushing through on the Hay River at Meander River, which is approximately 100 km upstream of the Alberta/NWT border.
        - Corresponding rises in water level have been relatively small.
    - The Chinchaga River, the southern tributary to the Hay River, has shown significant thermal break-up with some ice movement.
    - Forecasted weather over the weekend should limit further melt of snow and river ice.
- Water levels continue to rise slowly along the Hay River and its tributaries;
    - The rate of water level rise is low;
    - Water levels remain well below average for this time of year.
- April temperatures throughout the basin have been mostly above normal, which has resulted in an early season snowmelt.
- Temperatures in the Hay River basin are expected to be variable for the rest of the weekend, with temperatures fluctuating 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.

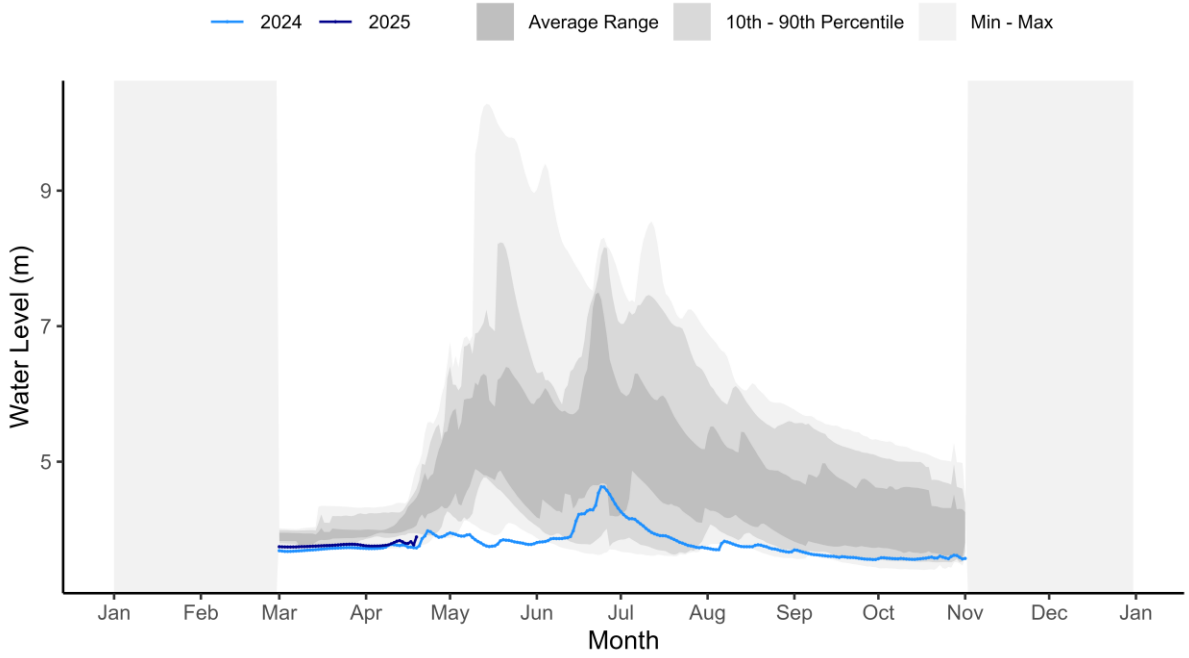
Hydrometric Data:

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



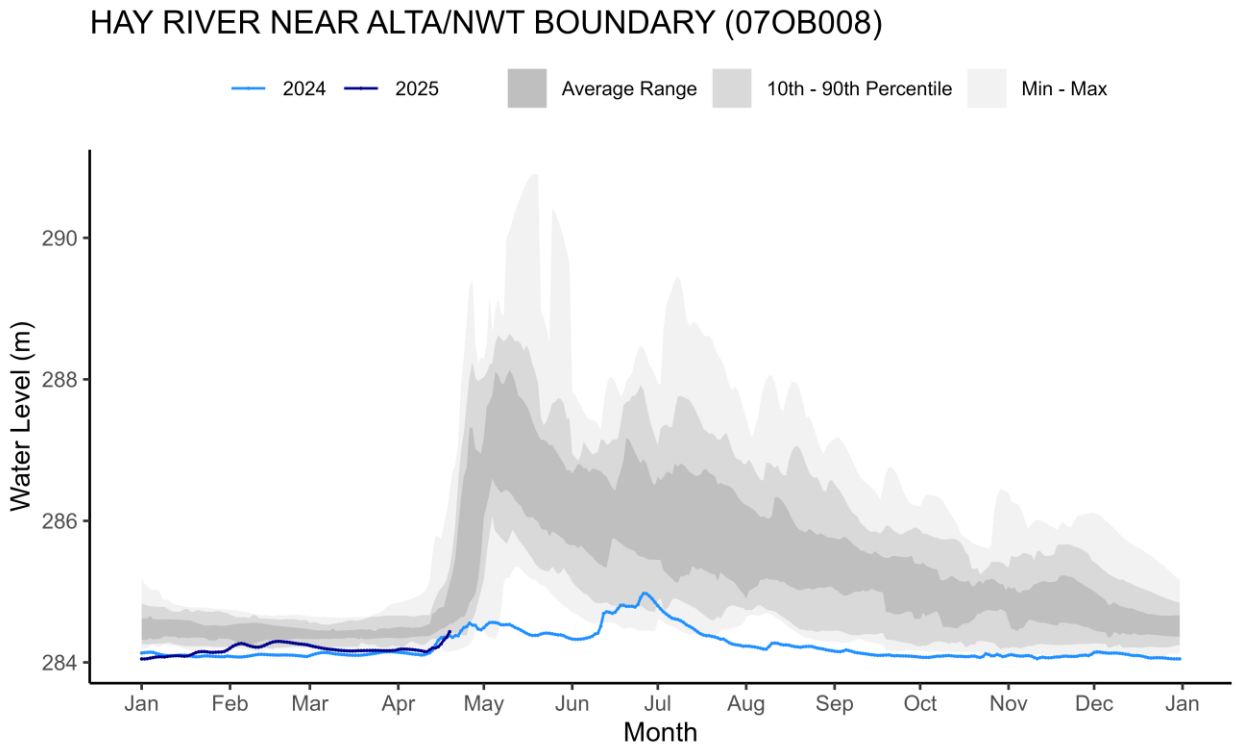
Above – Water level data for the Chinchaga River near High Level. Daily average levels for the previous year are also shown here.

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 19 at 11:00. 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 19 at 11:00. Photo courtesy of Water Survey of Canada and GNWT.

Liard River:

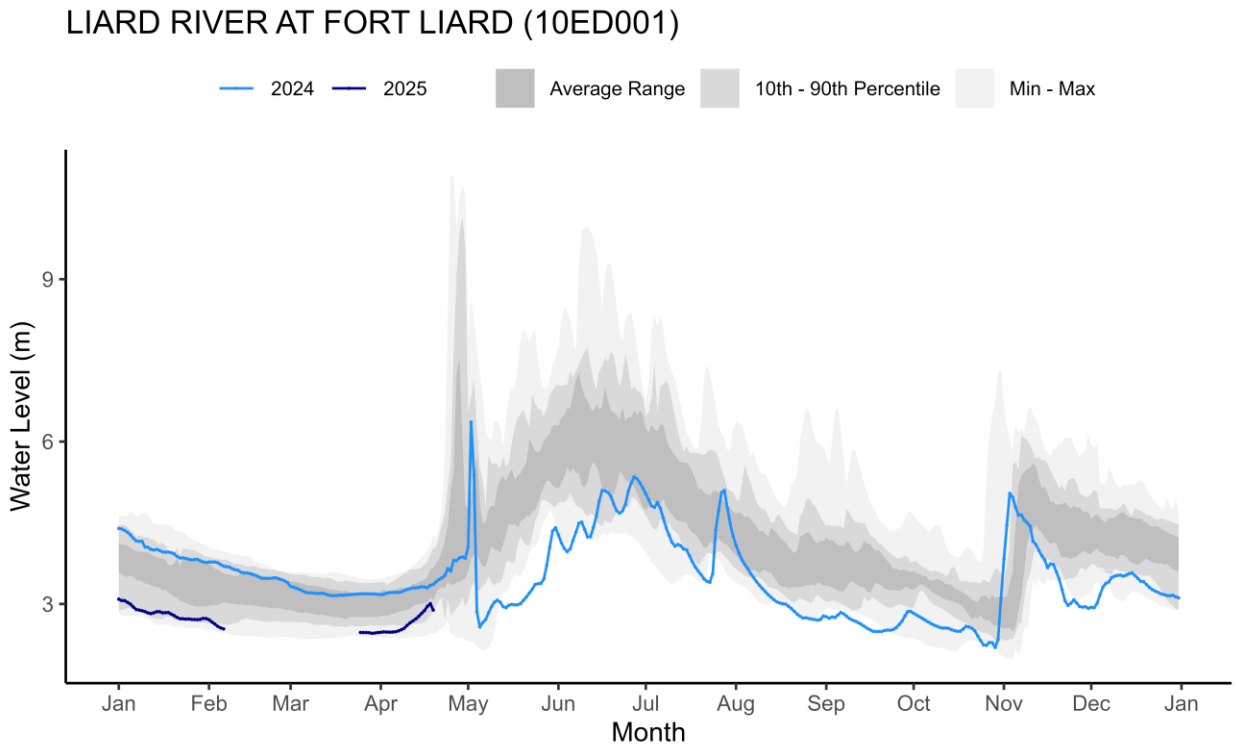
Current Status:

- Early season snowmelt has been substantial in the lower Liard River basin;
    - This is the low-lying (non-mountainous) area in northern BC and AB, and southwestern NWT.
- Ice remains intact along the Liard River within the NWT;
    - Small sections of open water have been observed along the banks.
    - Break-up is progressing along the Petitot River, a tributary to the Liard River.
- 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 above average over the rest of the weekend, with a chance of rain this afternoon.

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 19 at 11:00. Photo courtesy of Water Survey of Canada and GNWT.

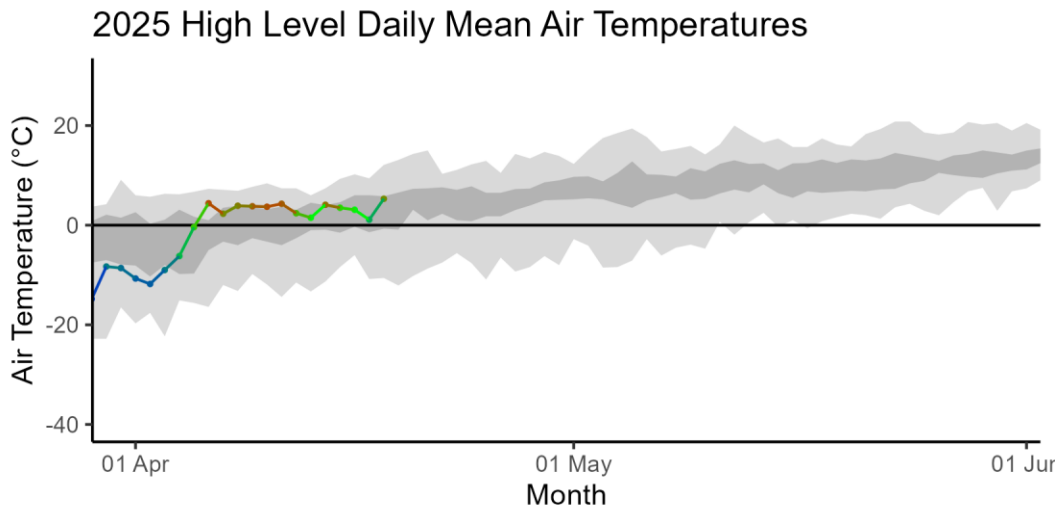
Liard River near the mouth [10ED002]:

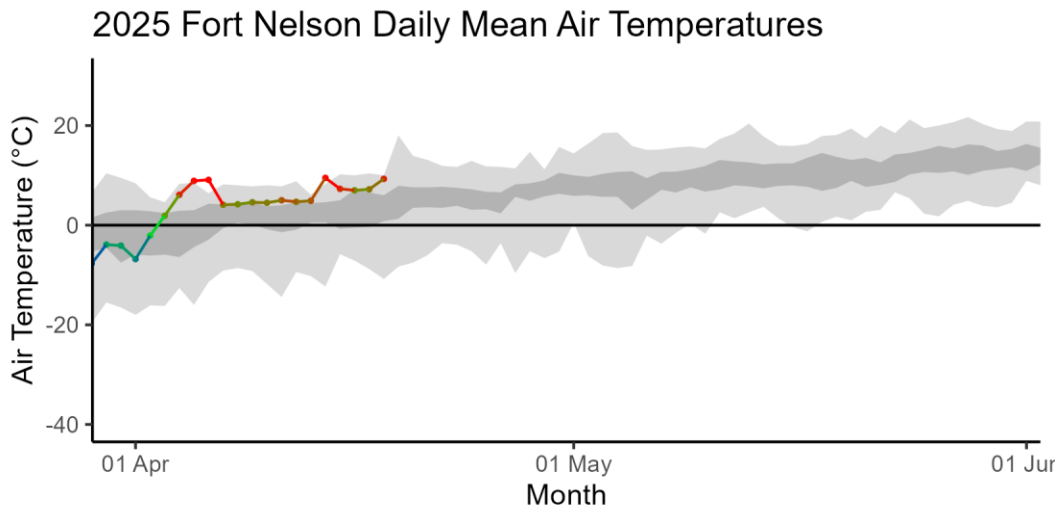
Above – Liard River near the mouth hydrometric gauge photo from April 19 at 11:00. Photo courtesy of Water Survey of Canada and GNWT.

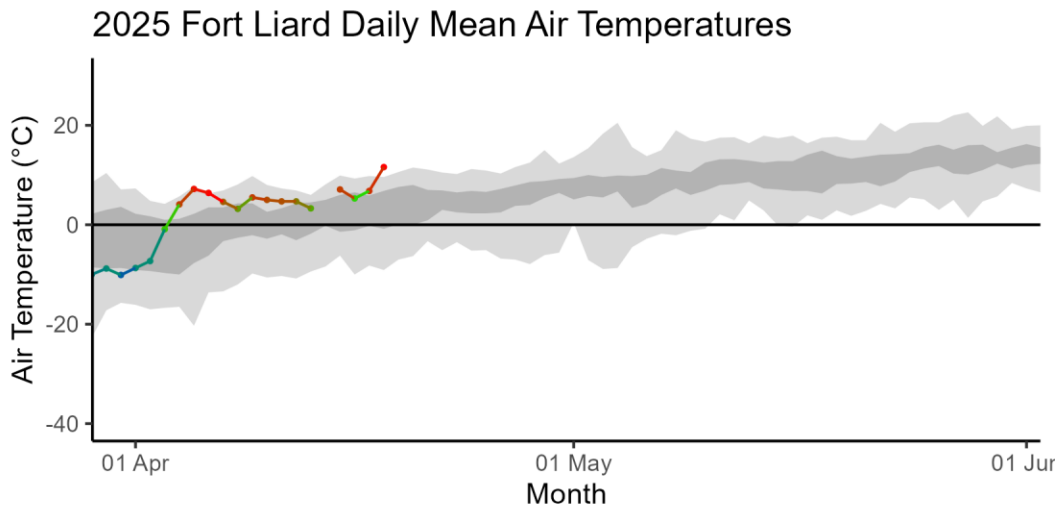
Weather Data:

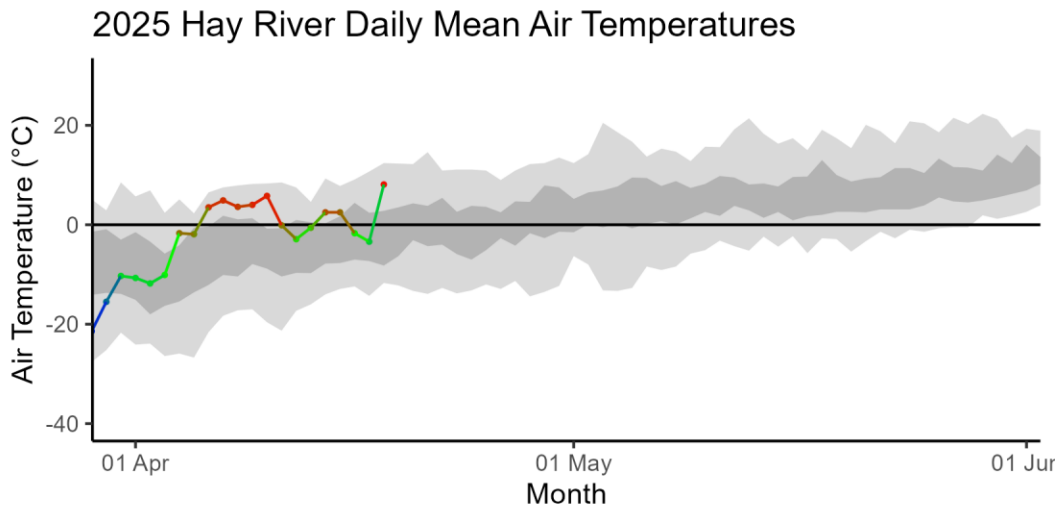
Weather information informs how snow and ice will melt and provides information about how this spring is unfolding relative to previous springs. Warmer than normal conditions early in the spring allow for additional energy to melt the snowpack and soften river ice. Rain-on-snow events can cause rapid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

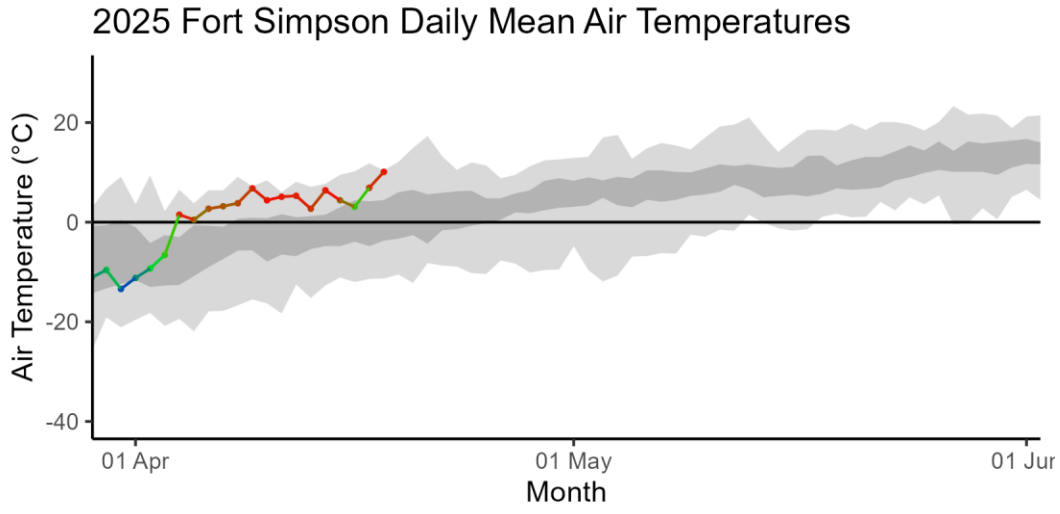
The Hay River basin and the southern Dehcho region are forecast to see average to above average temperatures for the rest of the weekend.






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:

Sat 19 Apr	Sun 20 Apr	Mon 21 Apr	Tue 22 Apr	Wed 23 Apr	Thu 24 Apr	Fri 25 Apr
7°C 60% Chance of rain showers or flurries	7°C Clearing	11°C A mix of sun and cloud	6°C A mix of sun and cloud	11°C A mix of sun and cloud	10°C A mix of sun and cloud	14°C A mix of sun and cloud
Tonight	**Night**	**Night**	**Night**	**Night**	**Night**	
-3°C 60% Chance of showers	-3°C Cloudy	-3°C Clear	-2°C Cloudy periods	-6°C Cloudy periods	-4°C Cloudy periods	

Fort Nelson seven-day weather forecast:

Sat 19 Apr	Sun 20 Apr	Mon 21 Apr	Tue 22 Apr	Wed 23 Apr	Thu 24 Apr	Fri 25 Apr
10°C Cloudy	10°C Mainly cloudy	13°C Sunny	10°C A mix of sun and cloud	12°C A mix of sun and cloud	11°C 30% Chance of flurries or rain showers	11°C A mix of sun and cloud
Tonight	**Night**	**Night**	**Night**	**Night**	**Night**	
1°C Cloudy	0°C 30% Chance of showers	0°C Cloudy periods	0°C Cloudy periods	-1°C Cloudy periods	1°C Cloudy periods	

Fort Liard seven-day weather forecast:

Sat 19 Apr	Sun 20 Apr	Mon 21 Apr	Tue 22 Apr	Wed 23 Apr	Thu 24 Apr	Fri 25 Apr
9°C 30% Chance of showers	8°C A mix of sun and cloud	13°C A mix of sun and cloud	5°C Cloudy	8°C Cloudy	7°C A mix of sun and cloud	10°C A mix of sun and cloud
Tonight	**Night**	**Night**	**Night**	**Night**	**Night**	
-1°C 30% Chance of flurries or rain showers	-2°C Clear	-3°C Cloudy	-3°C 40% Chance of rain showers or flurries	-5°C Cloudy periods	-3°C Cloudy periods	

Hay River seven-day weather forecast:

Sat 19 Apr	Sun 20 Apr	Mon 21 Apr	Tue 22 Apr	Wed 23 Apr	Thu 24 Apr	Fri 25 Apr
 3°C 60% Chance of rain showers or flurries	 -3°C Mainly sunny	 7°C A mix of sun and cloud	 -2°C A mix of sun and cloud	 0°C A mix of sun and cloud	 -1°C Sunny	 5°C Sunny
Tonight	**Night**	**Night**	**Night**	**Night**	**Night**	
 -10°C Partly cloudy	 -8°C Cloudy periods	 -9°C 60% Chance of rain showers or flurries	 -8°C Cloudy periods	 -10°C Clear	 -6°C Clear	

Fort Simpson seven-day weather forecast:

Sat 19 Apr	Sun 20 Apr	Mon 21 Apr	Tue 22 Apr	Wed 23 Apr	Thu 24 Apr	Fri 25 Apr
 6°C 30% Chance of flurries or rain showers	 4°C Mainly cloudy	 2°C 30% Chance of flurries	 4°C Cloudy	 5°C Cloudy	 5°C A mix of sun and cloud	 9°C A mix of sun and cloud
Tonight	**Night**	**Night**	**Night**	**Night**	**Night**	
 -6°C Partly cloudy	 -3°C Cloudy	 -6°C Cloudy	 -7°C Cloudy	 -7°C Cloudy periods	 -3°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

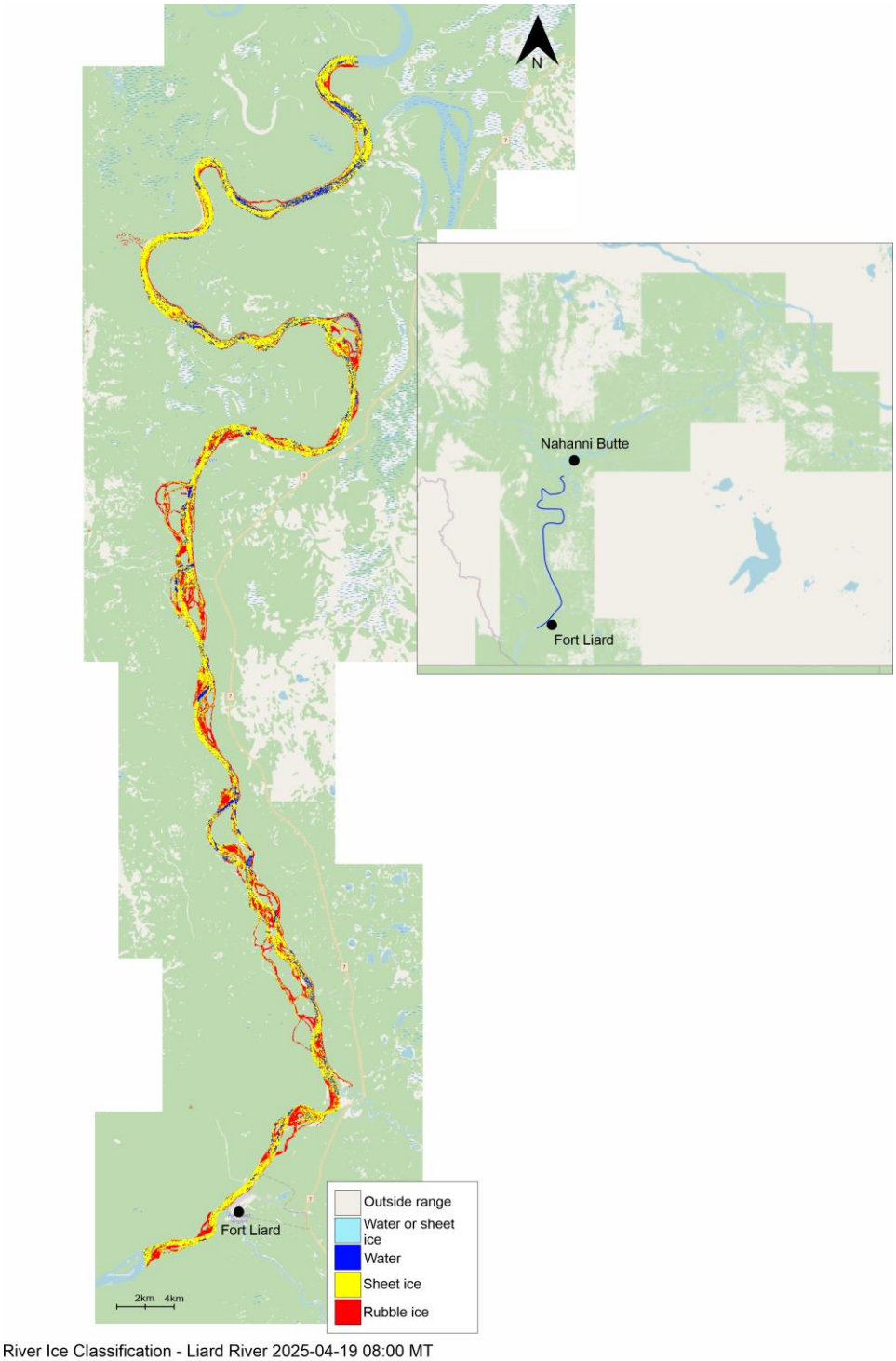
river reach has different locations that are prone to ice jams. The location of the ice jam can be an important factor as to whether or not a community floods. Furthermore, ice will jam and then move again at multiple locations along a river as break-up progresses downstream. The timing and location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

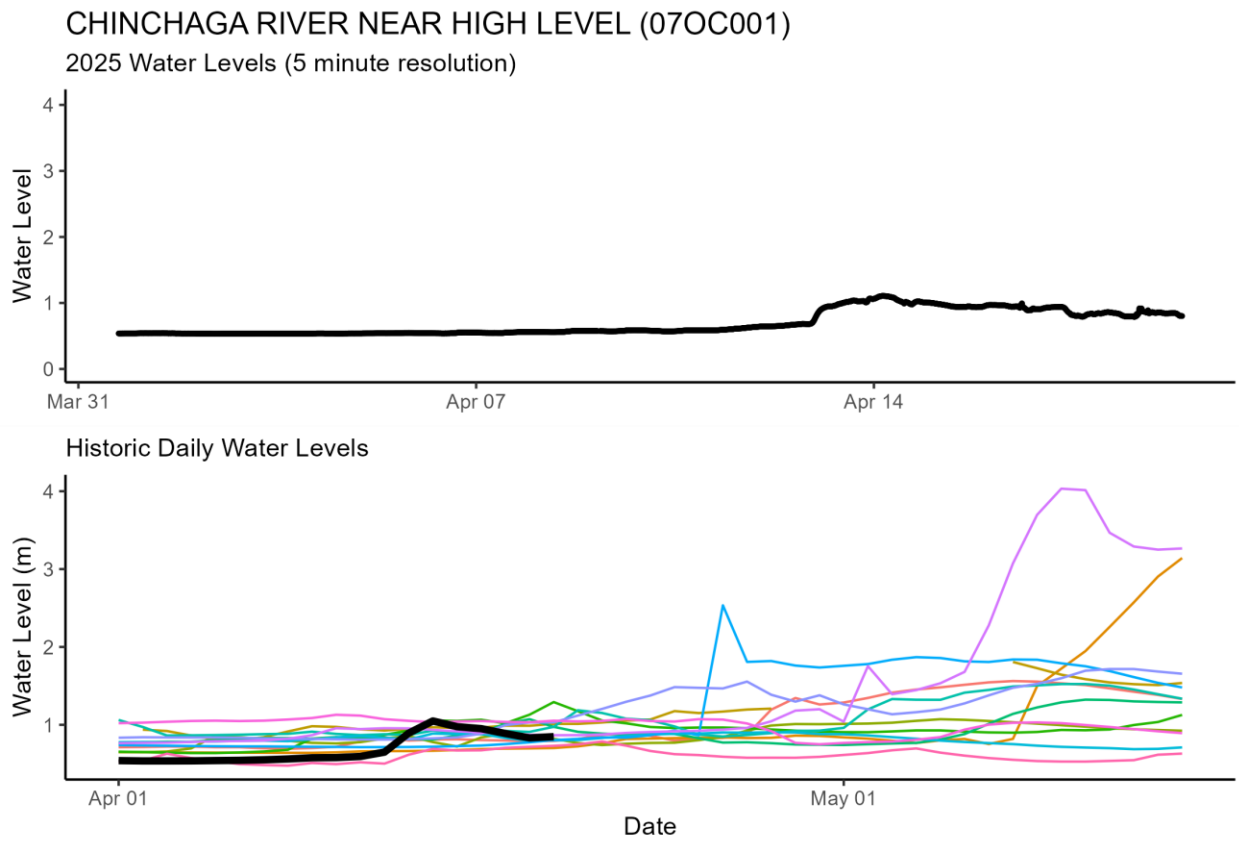
Appendix A: River Ice Imagery



Above – Classified river ice image of the Liard River near Fort Liard. The image was acquired this morning at 08:00 MDT and is courtesy of the federal government's Government Operations Centre. The river ice classification was completed using the IceBC algorithm.

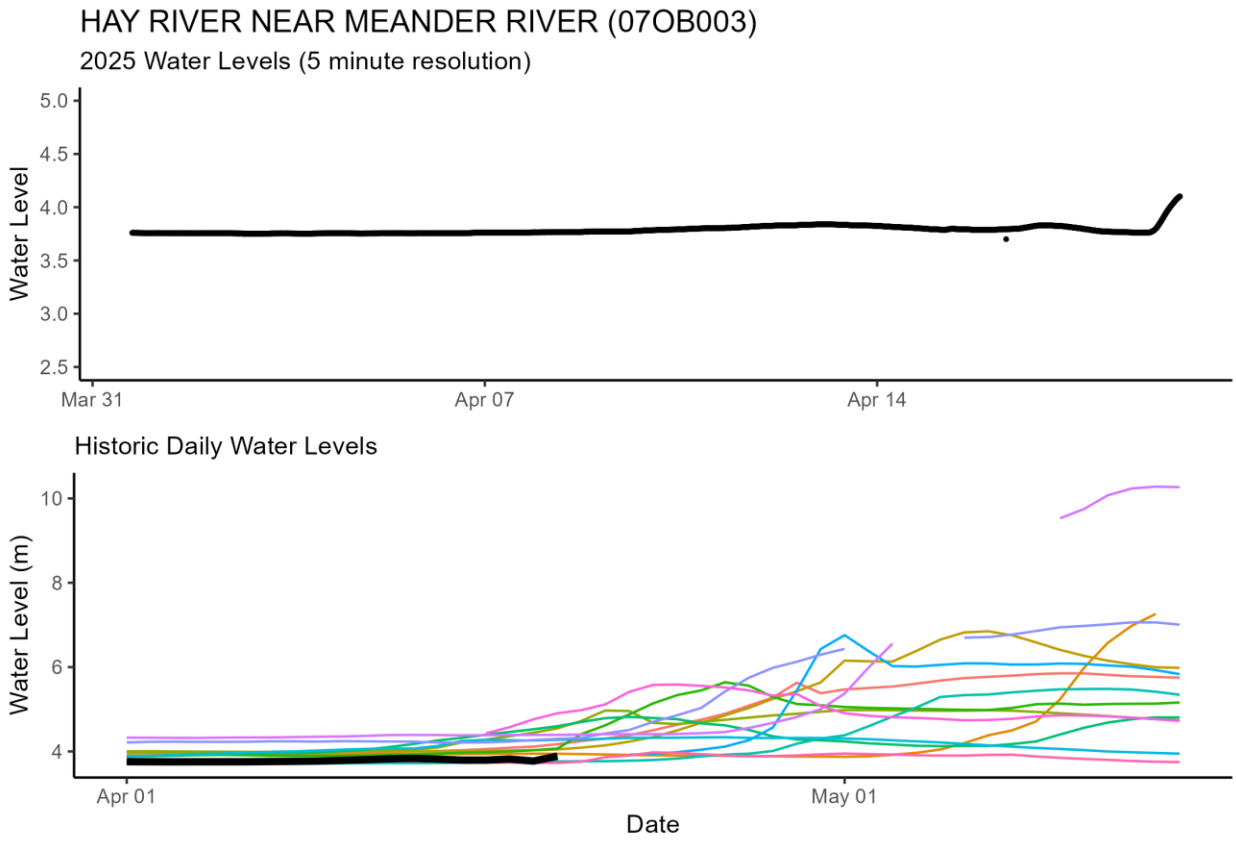
Appendix B: High resolution and historic water level plots

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



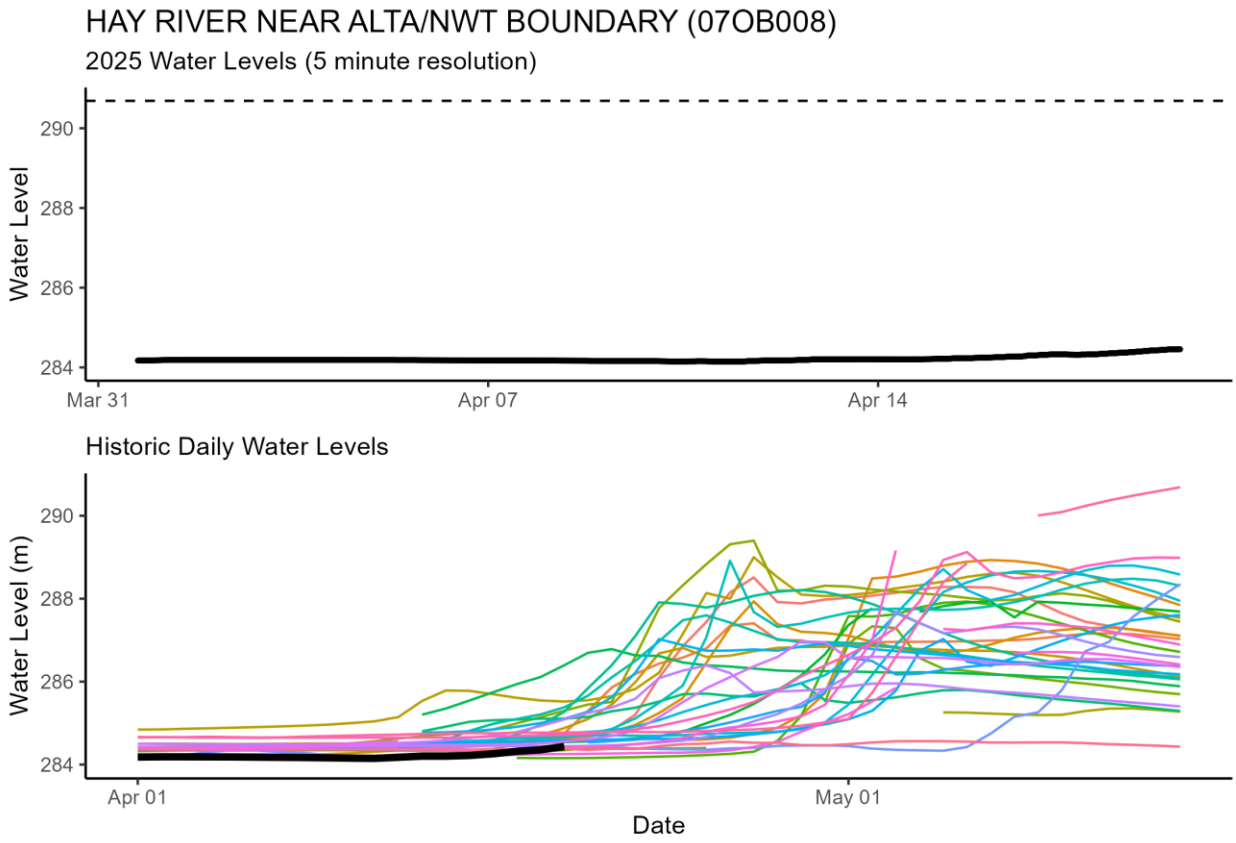
Above – Water level data at the Chinchaga River near High Level, AB. This plot shows high resolution (5 minute) water level data on the top, and daily average data on the bottom.

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



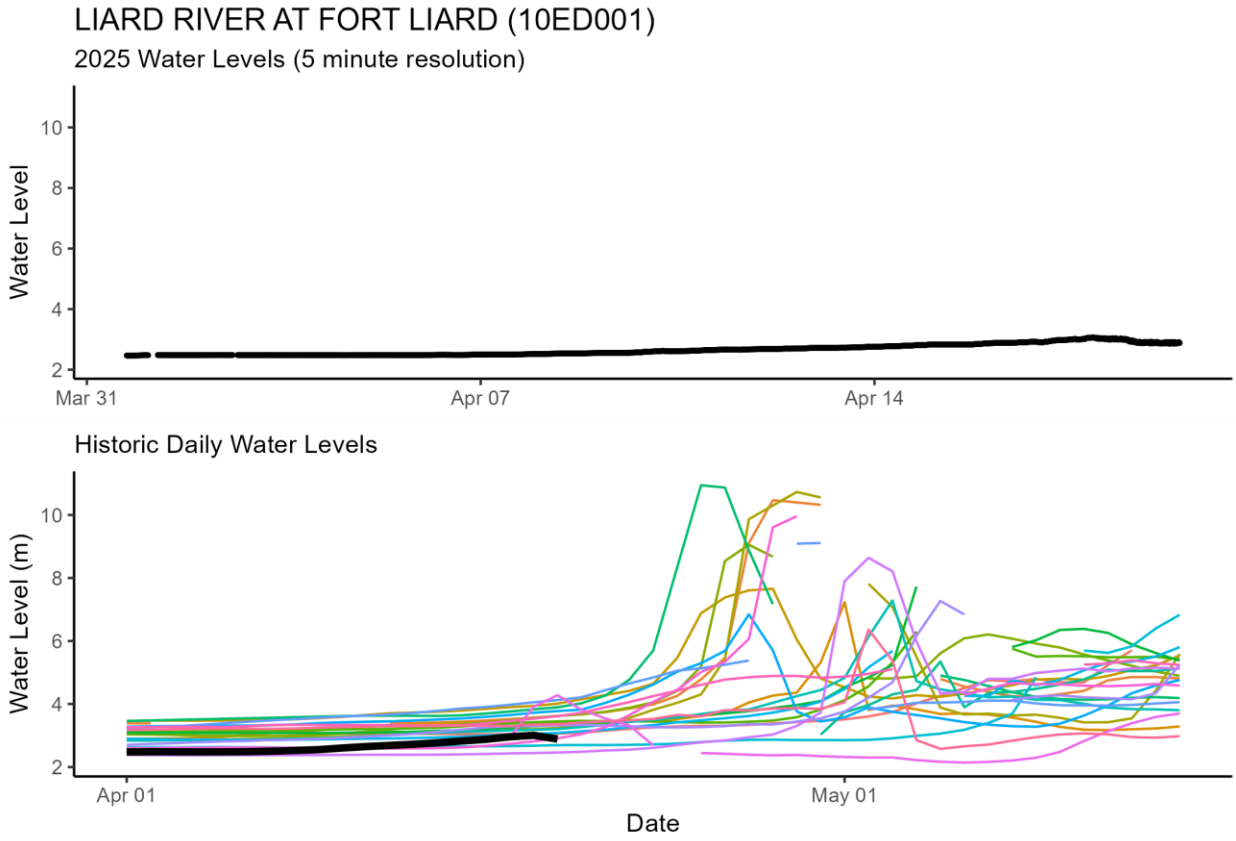
Above – Water level data on the Hay River near Meander River, AB.

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]: