Government of
Northwest Territories

# NWT Water Monitoring Bulletin – May 24th, 2024 at 16:00

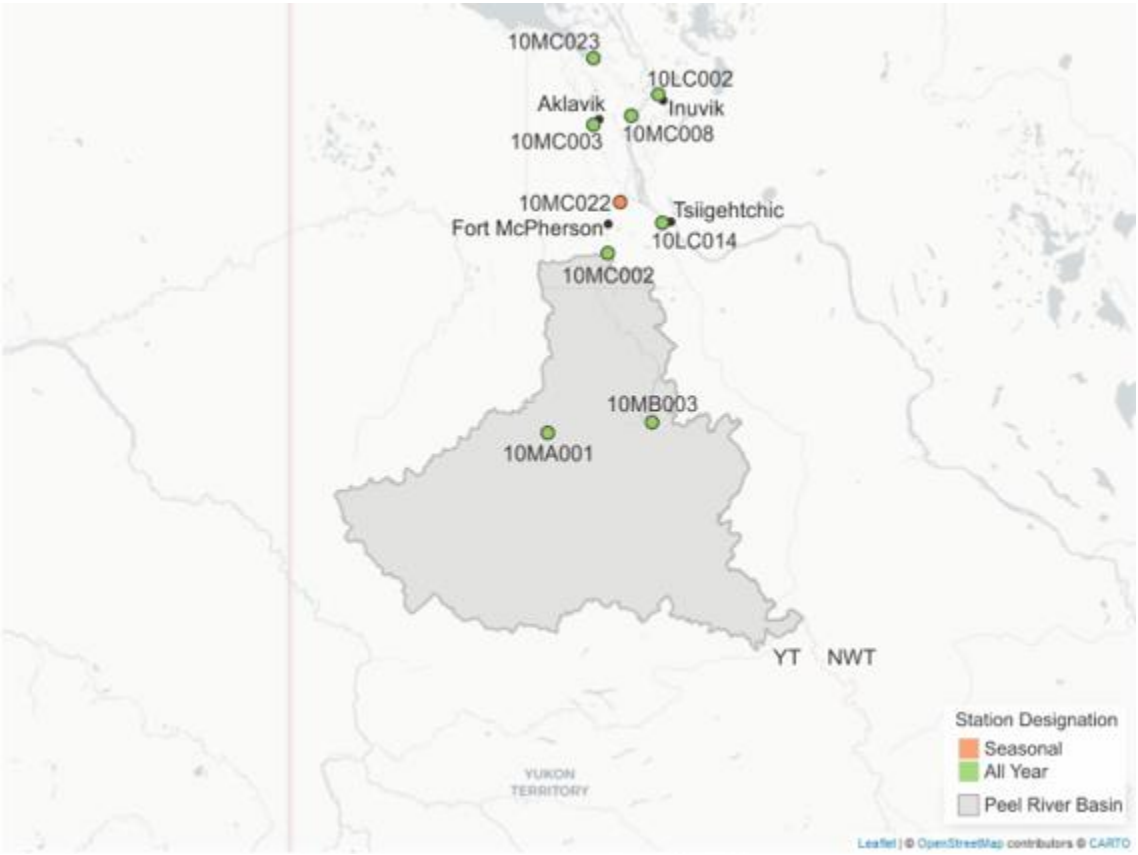
NWT break up reports will be published routinely as break up unfolds. These reports will focus on regions with active snowmelt and ice break up. The geographic focus of the report will shift as conditions change. Additional information about basin conditions can be found in the ECC Snow Survey Bulletin 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:

- Break up continues to progress down the Mackenzie River and into the Mackenzie Delta.
    - The ice front has continued to move downstream of Tsiigehtchic.
    - There are intermittent stretches of open water and sheet ice on the Mackenzie River near Tsiigehtchic.
    - Water levels are rising underneath the ice downstream of Tsiigehtchic.
- Water levels under the ice on the Mackenzie River at Aklavik are continuing to rise, but remain lower than normal for this time of year.
- Water levels on the Mackenzie River upstream of the ice front remain very low.
- In the Beaufort Delta region, significant precipitation is expected to fall today and tomorrow. Environment and Climate Change Canada has issued a winter storm warning for Aklavik and both a rainfall warning and freezing rain warning for Inuvik.
    - Precipitation falling as rain will degrade ice and further advance break up.
    - While the amount of precipitation falling in the Beaufort Delta is unlikely to influence water levels on the major channels of the Mackenzie Delta, ice jams could result in temporary water level increases throughout the region.

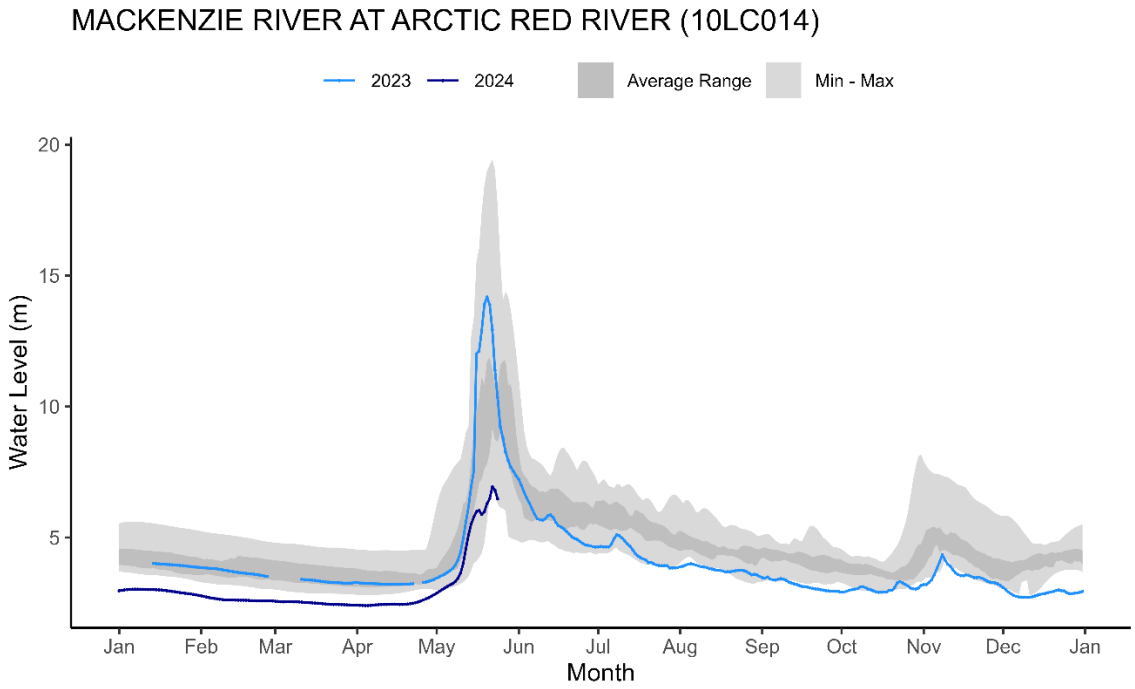
# Contents

## Beaufort Delta:

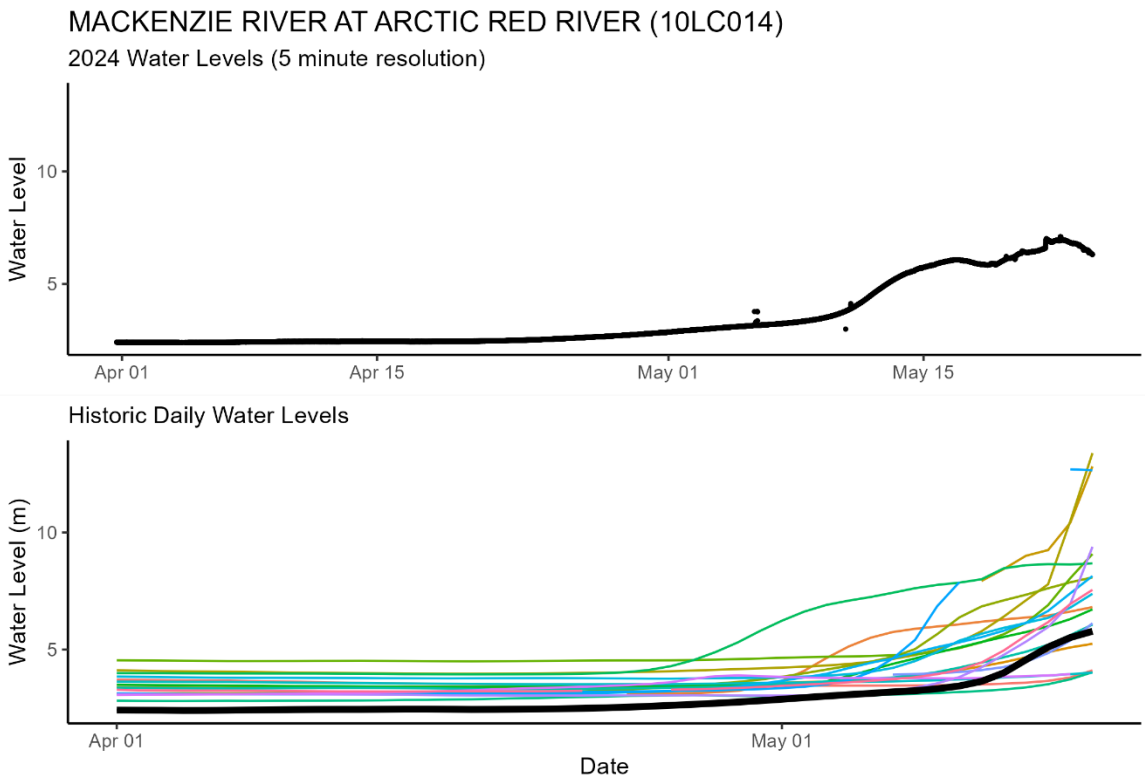


## Hydrometric Data:

### Mackenzie River at Arctic Red River [10LC014]:



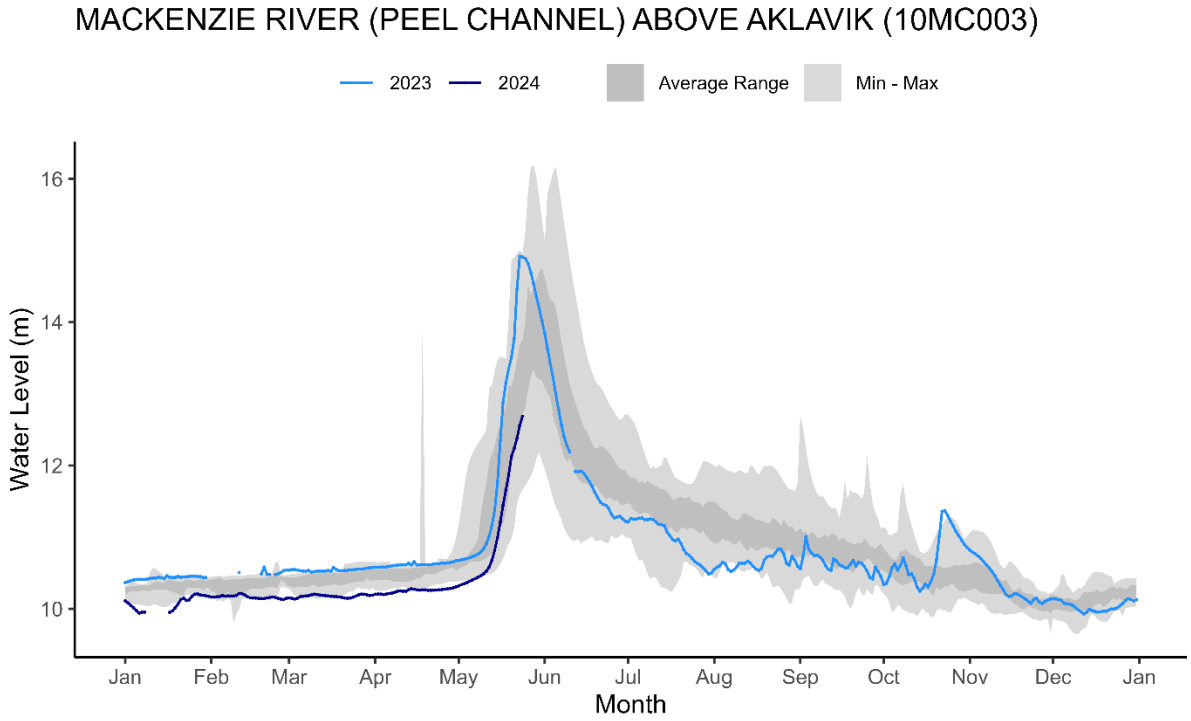

*Above* – Water level data for the Mackenzie River at Arctic Red River. Daily average levels for this year and the previous year are shown here.



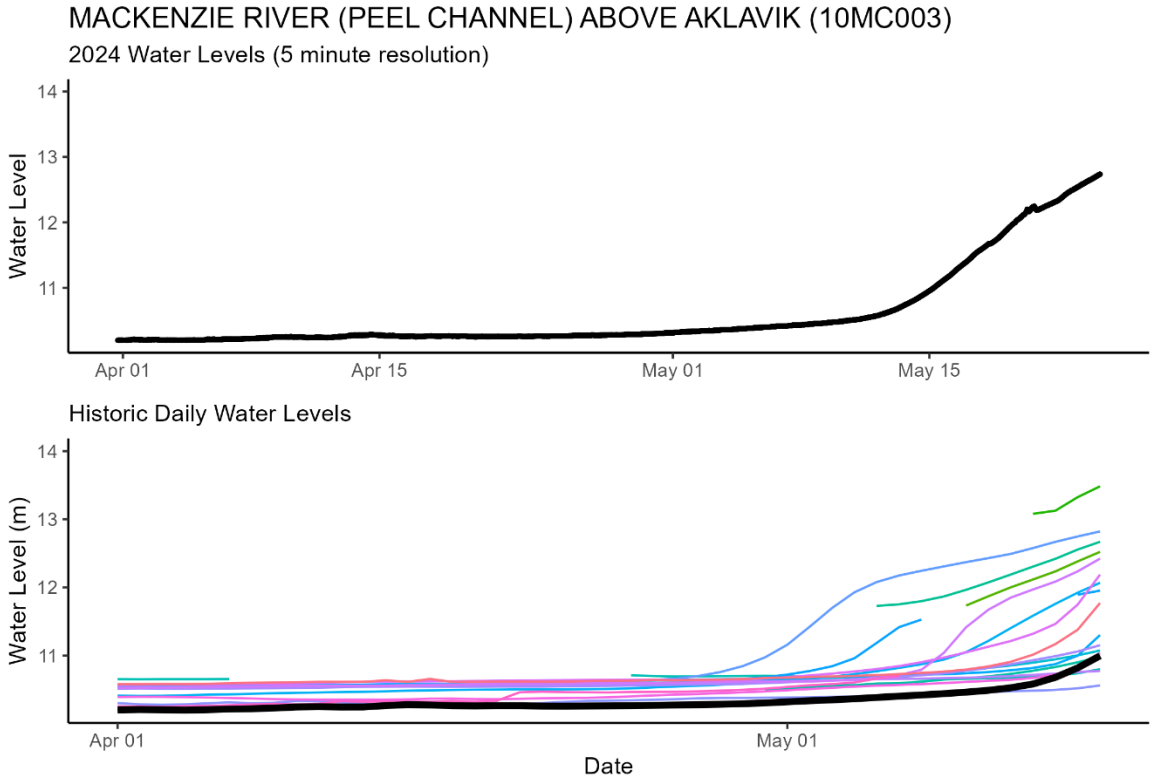

*Above:* The upper graph in the figure presents real time water level data at 5-minute resolution. The lower graph shows daily average levels relative to the previous 20 years.


*Above* – Mackenzie River at Arctic Red River hydrometric gauge photo from May 24th at 12:00. Photo courtesy of Water Survey of Canada and GNWT.

## Mackenzie River (Peel Channel) above Aklavik [10MC003]:



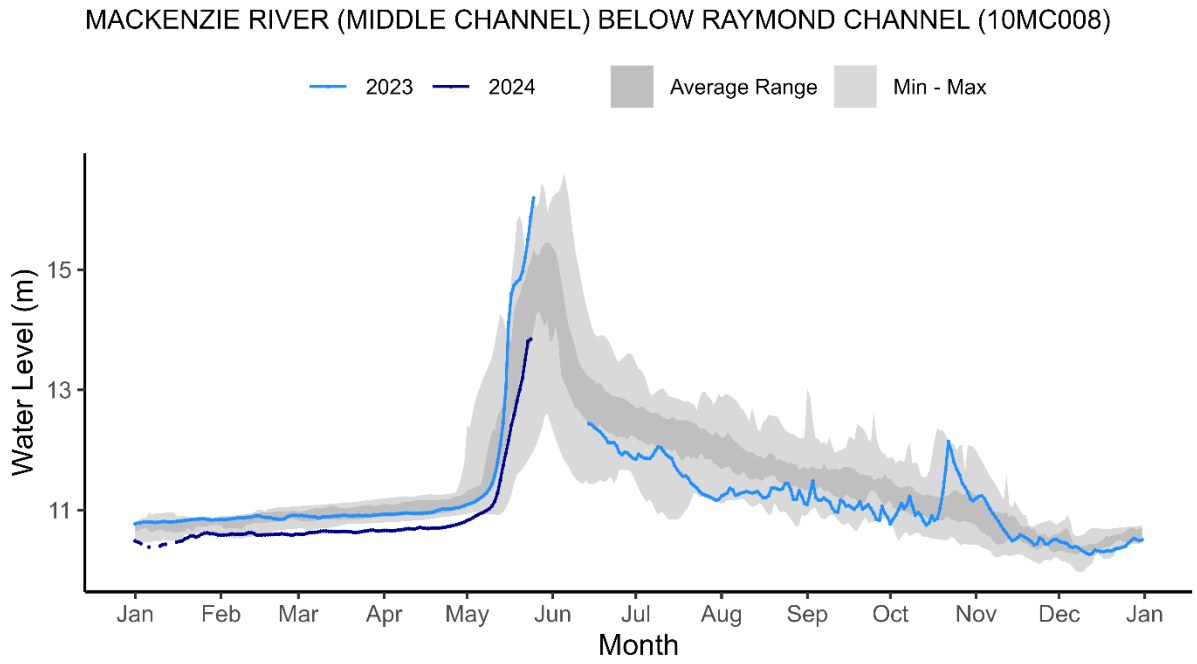

*Above* – Water level data for the Mackenzie River (Peel Channel) above Aklavik. Daily average levels for this year and the previous year are shown here.



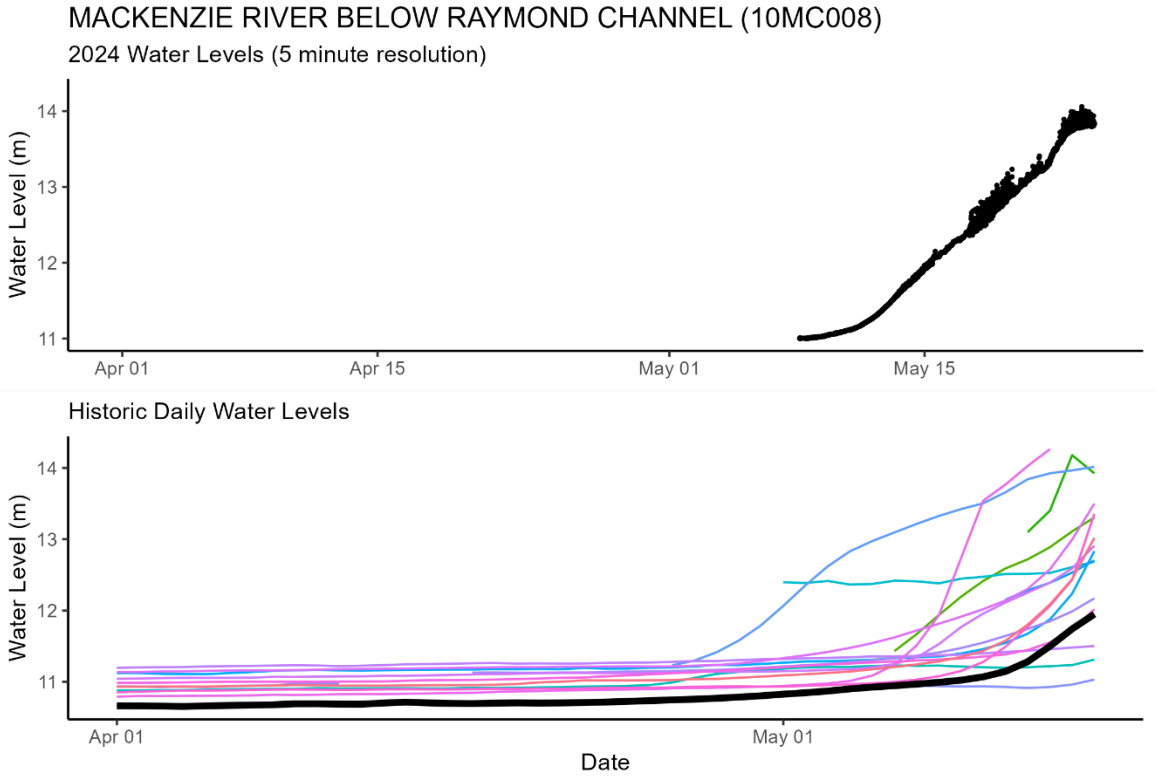

*Above:* The upper graph in the figure presents real time water level data at 5-minute resolution. The lower graph shows daily average levels relative to the previous 20 years.


*Above* – Mackenzie River (Peel Channel) above Aklavik hydrometric gauge photo from May 24th at 10:00. Photo courtesy of Water Survey of Canada and GNWT.

## Mackenzie River (Middle Channel) below Raymond Channel [10MC008]:



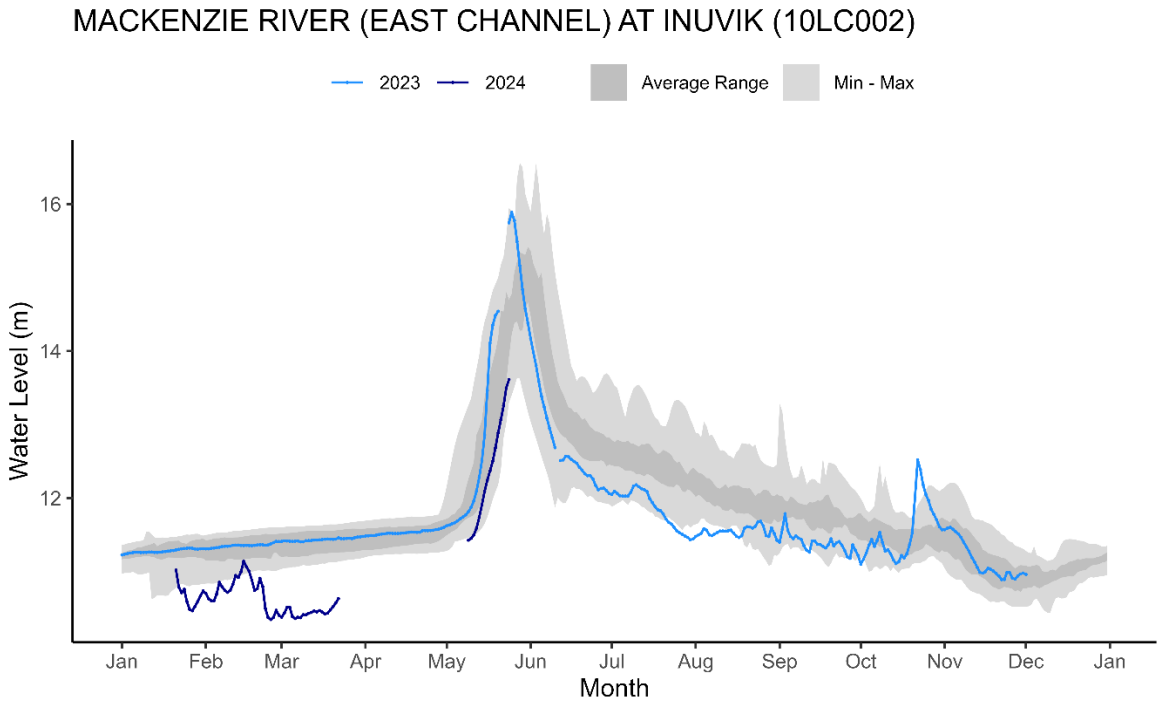

*Above* – Water level data for the Mackenzie River (Middle Channel) below Raymond Channel. Daily average levels for this year and the previous year are shown here.



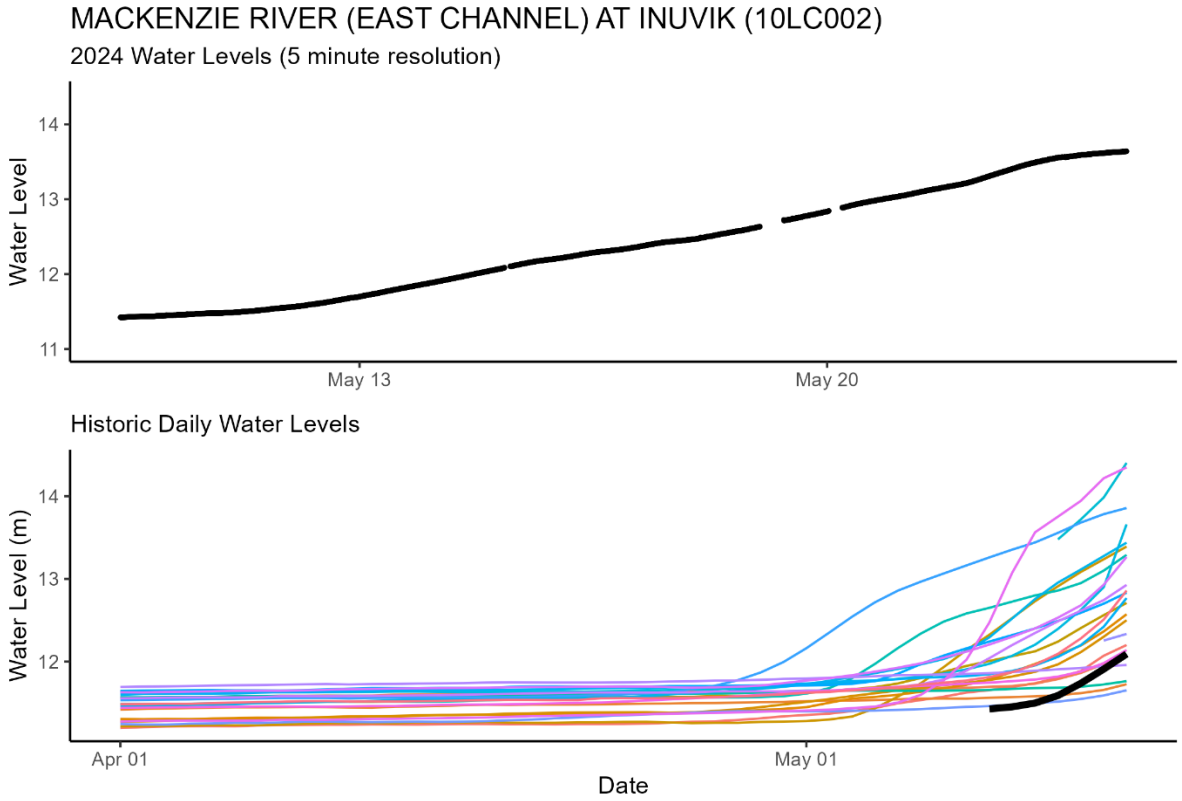

*Above:* The upper graph in the figure presents real time water level data at 5-minute resolution. The lower graph shows daily average levels relative to the previous 20 years.


*Above* – Mackenzie River (Middle Channel) below Raymond Channel hydrometric gauge photo from May 24th at 12:00. Photo courtesy of Water Survey of Canada and GNWT.

## Mackenzie River (East Channel) at Inuvik [10LC002]:




*Above* – Water level data for the Mackenzie River (East Channel) at Inuvik. Daily average levels for this year and the previous year are shown here.




*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.

# Weather Data:

## Current status and forecast:

The Beaufort-Delta region is forecast to see temperatures that are cooler than average for the weekend, with temperatures rising next week. Daytime high temperatures will be near zero with lows just below zero for today and Saturday. For Sunday and the beginning of next week, temperatures will be warmer with highs and lows above zero.

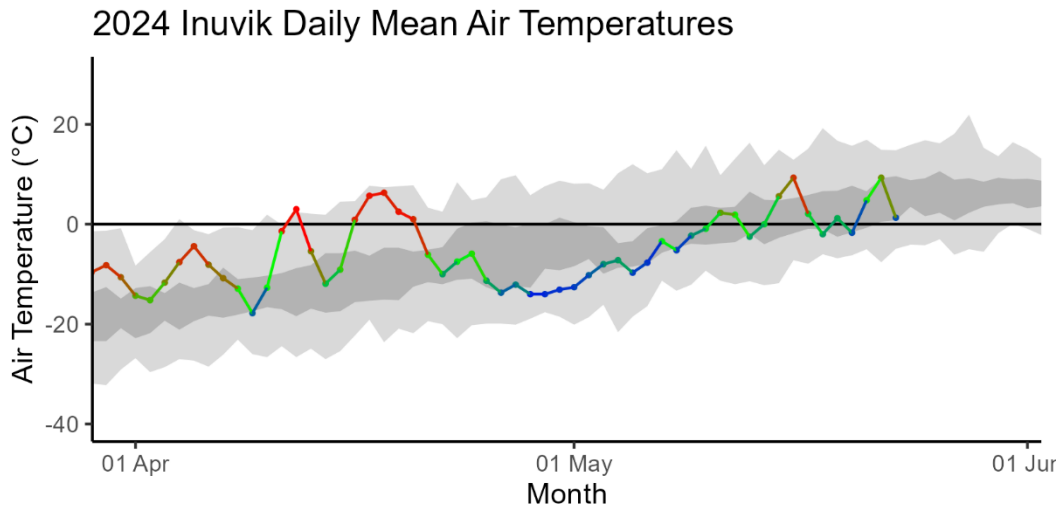
Significant precipitation (10-20 mm) is forecast by Environment and Climate Change Canada for the Beaufort-Delta starting today and continuing into the weekend.

## Background information and context:

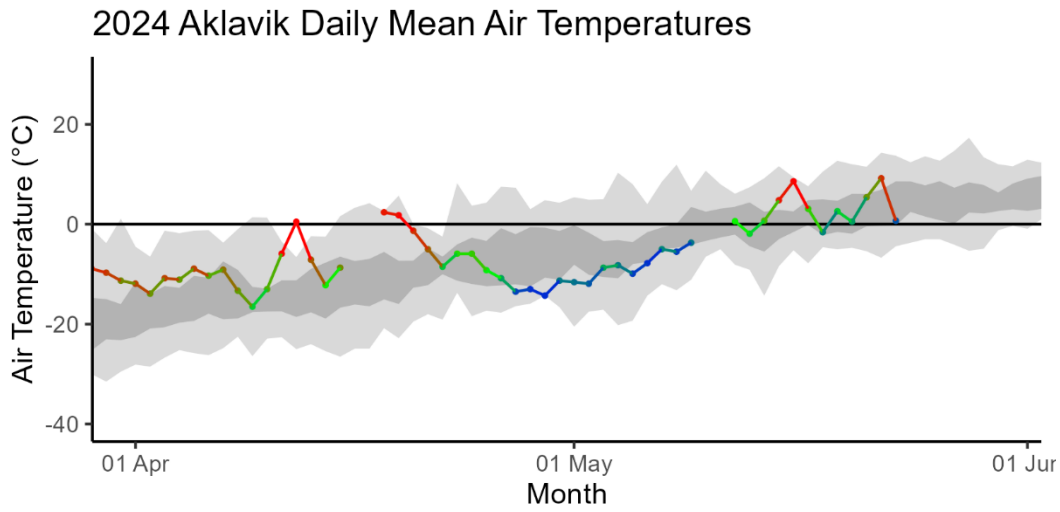
Weather information informs how snow and ice will melt and provides information about how this spring is unfolding relative to previous springs. Warmer than normal conditions early in the spring allow for additional energy to melt the snowpack and soften river ice. Rain-on-snow events can cause rapid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

## 2024 spring temperatures to-date:

### Inuvik:




### Aklavik:



## Seven-day weather forecast:

### Inuvik:

| Fri 24 May | Sat 25 May | Sun 26 May | Mon 27 May | Tue 28 May | Wed 29 May | Thu 30 May |
|---|---|---|---|---|---|---|
|  1°C Rain at times heavy or freezing rain |  1°C Snow |  4°C 30% Chance of flurries or rain showers |  6°C A mix of sun and cloud |  11°C Sunny |  14°C A mix of sun and cloud |  13°C A mix of sun and cloud |
| **Tonight** | **Night** | **Night** | **Night** | **Night** | **Night** | |
|  -1°C Rain at times heavy mixed with snow |  -2°C Cloudy |  3°C Cloudy |  5°C Sunny |  5°C A mix of sun and cloud |  3°C A mix of sun and cloud | |

### Aklavik:

| Fri 24 May | Sat 25 May | Sun 26 May | Mon 27 May | Tue 28 May | Wed 29 May | Thu 30 May |
|---|---|---|---|---|---|---|
|  0°C Snow at times heavy mixed with freezing rain |  1°C Snow |  3°C 30% Chance of flurries or rain showers |  5°C A mix of sun and cloud |  7°C Sunny |  7°C A mix of sun and cloud |  9°C A mix of sun and cloud |
| **Tonight** | **Night** | **Night** | **Night** | **Night** | **Night** | |
|  -1°C Snow at times heavy |  -2°C A mix of sun and cloud |  2°C Cloudy |  4°C A mix of sun and cloud |  2°C A mix of sun and cloud |  2°C A mix of sun and cloud | |

## Factors to Watch:

It is important to note that much of the water contributing to flooding of NWT communities 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 snow pack 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, Nahanni Butte, 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 form when 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 will 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. 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.