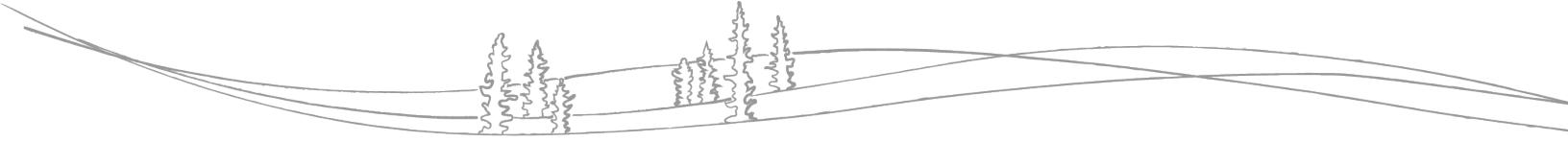




NWT Water Monitoring Bulletin

– May 22, 2022: 09:30



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 ENR 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.

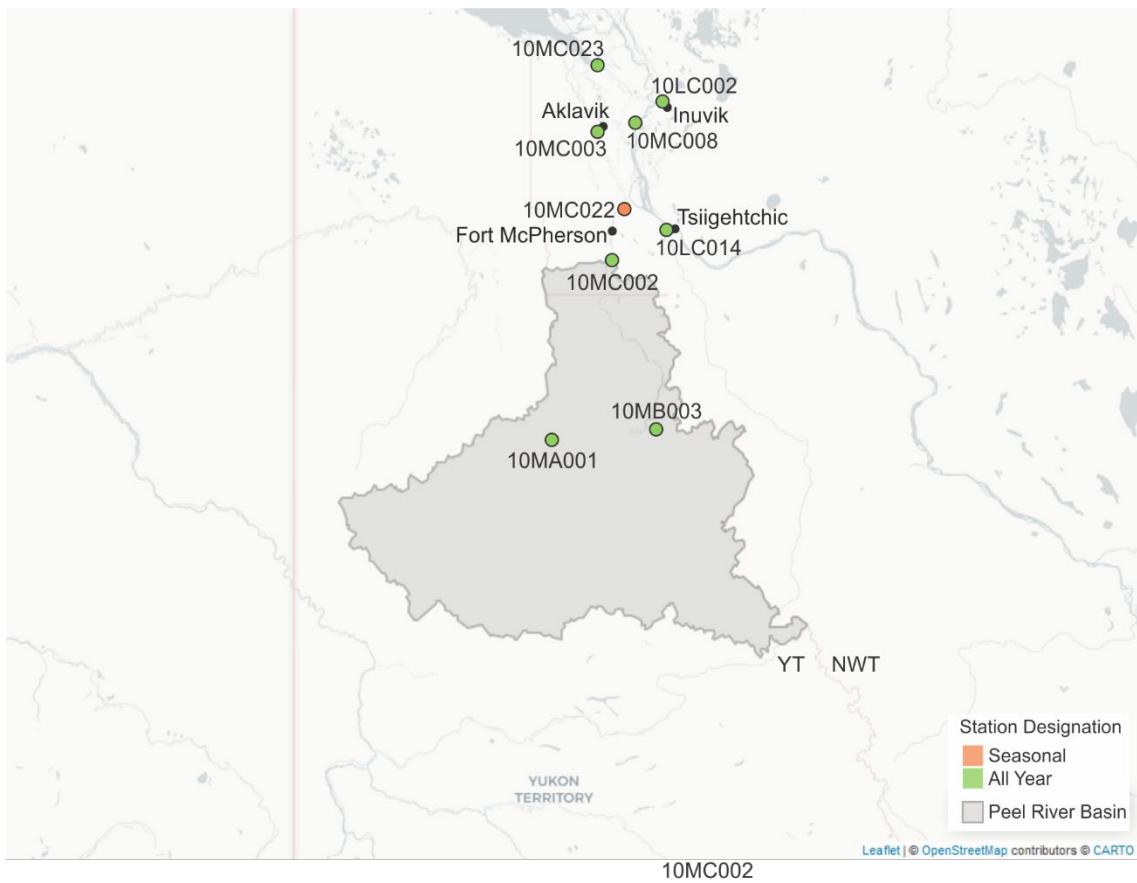
Current Status:

- Ice is moving on the Mackenzie River near Tsiigehtchic;
- Water levels under ice continue to increase in the Mackenzie River Delta, at normal rates for this time of year;
 - The timing of breakup in the Delta is average relative to the previous 20 years.
- Ice is moving on the Peel River;
 - Water levels on the Peel River rose more rapidly over the past 24 hours, after previously slowing in response to cool weather. Ice from upstream is pushing along the river at Fort McPherson. The rise in water levels remains within normal ranges.

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Peel River and Beaufort Delta



Above – Map of select hydrometric stations in the Peel River basin and the Beaufort Delta. The station numbers are referenced in the water level plots below.

Hydrometric Data:

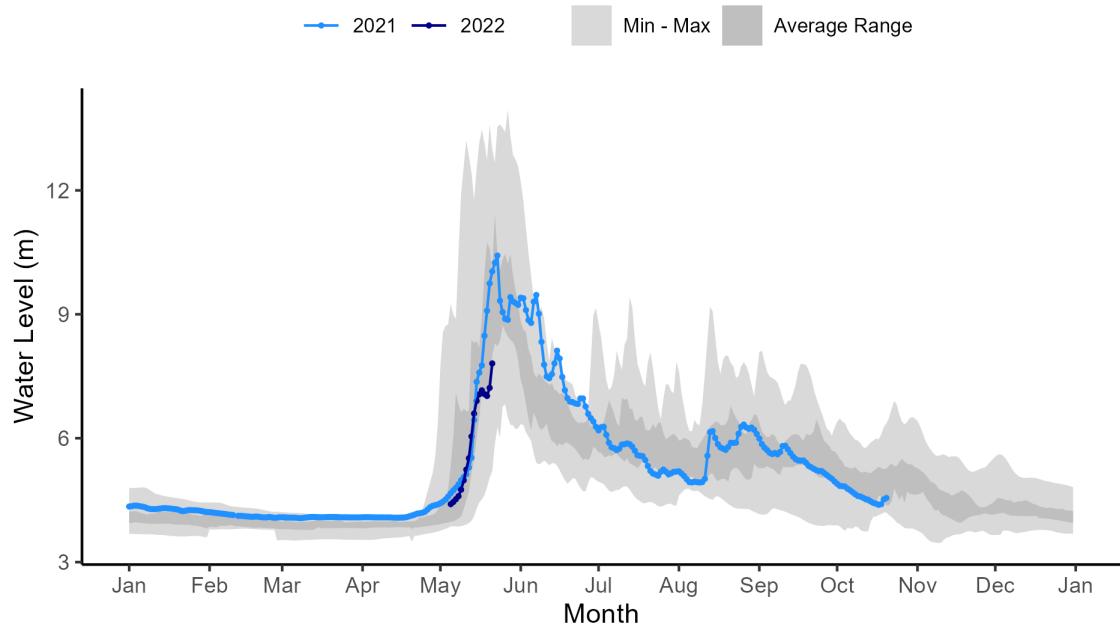
Mackenzie River at Arctic Red River [10LC014]:

Note: Ice has impacted the gauge and it is not currently producing accurate data.



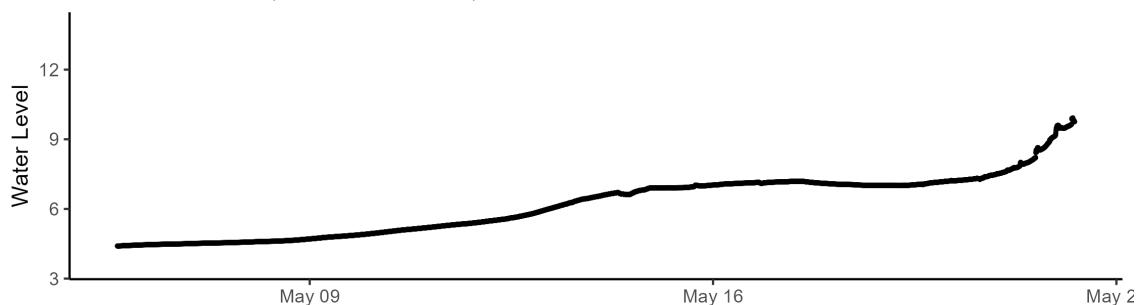
Above – Mackenzie River at Arctic Red River hydrometric gauge photo from May 22 at 09:00. Photo courtesy of Water Survey of Canada and GNWT.

Peel River at Fort McPherson [10MC002]:
PEEL RIVER ABOVE FORT MCPHERSON (10MC002)

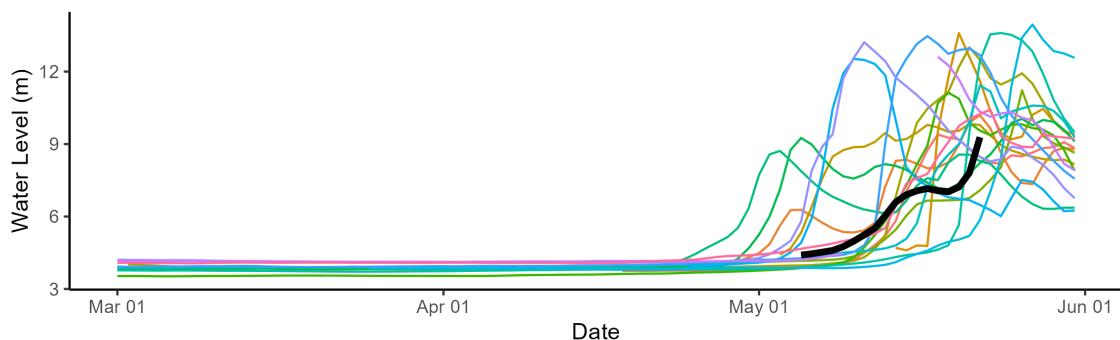


PEEL RIVER ABOVE FORT MCPHERSON (10MC002)

2022 Water Levels (5 minute resolution)



Historic Daily Water Levels

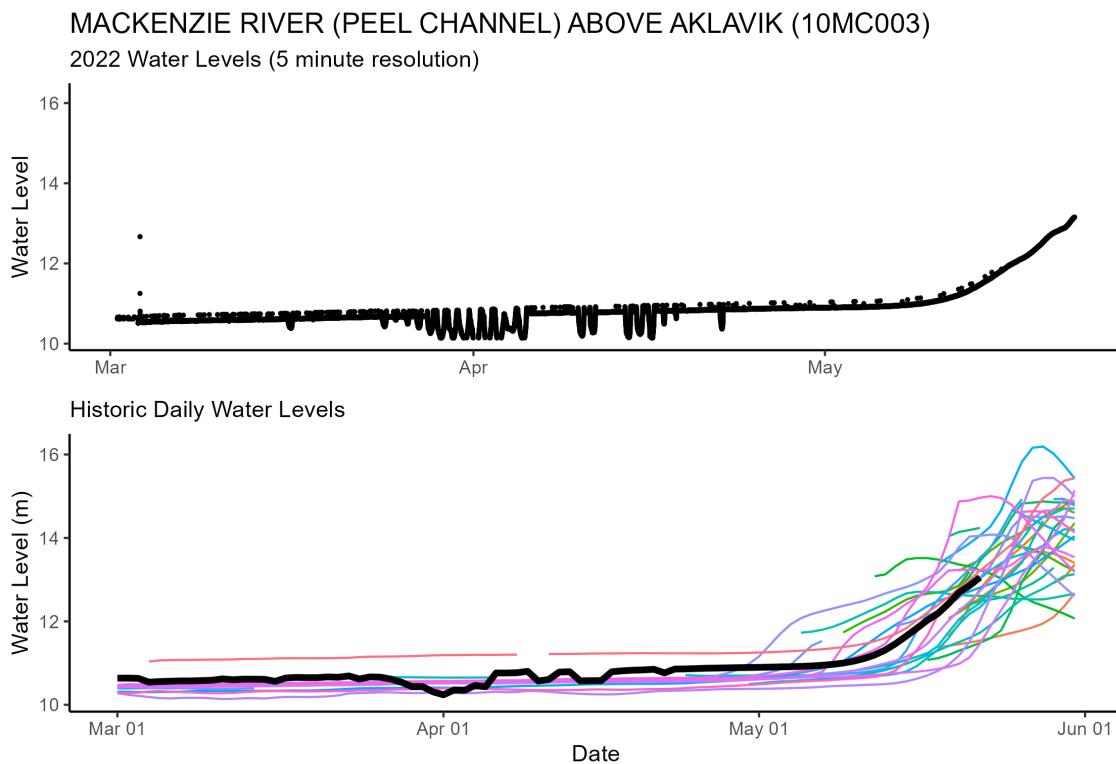
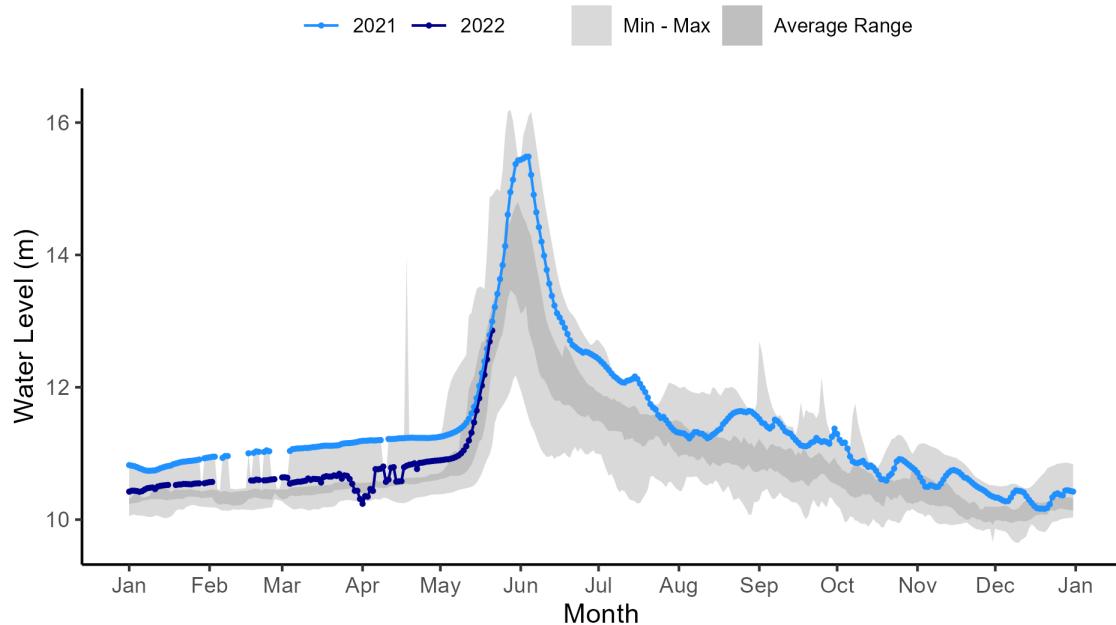


Above – The middle graph in the figure presents real time water level data at 5-minute resolution while the lower graph shows daily average levels relative to the previous 20 years. Water levels have risen more rapidly over the last 24 hours, with ice pushing through from upstream. The rise in water levels remains within normal ranges.



Above – Peel River at Fort McPherson hydrometric gauge photo from May 22 at 09:00. Photo courtesy of Water Survey of Canada and GNWT.

Mackenzie River (Peel Channel) at Aklavik [10MC003]:
MACKENZIE RIVER (PEEL CHANNEL) ABOVE AKLAVIK (10MC003)

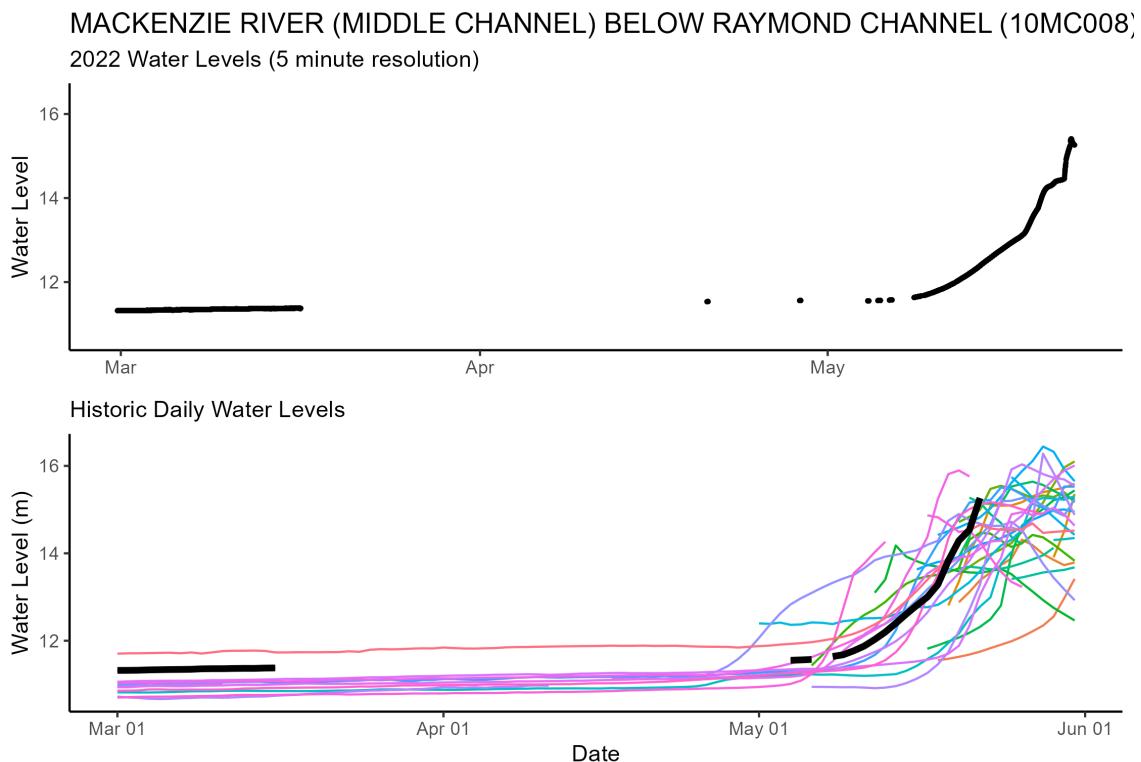
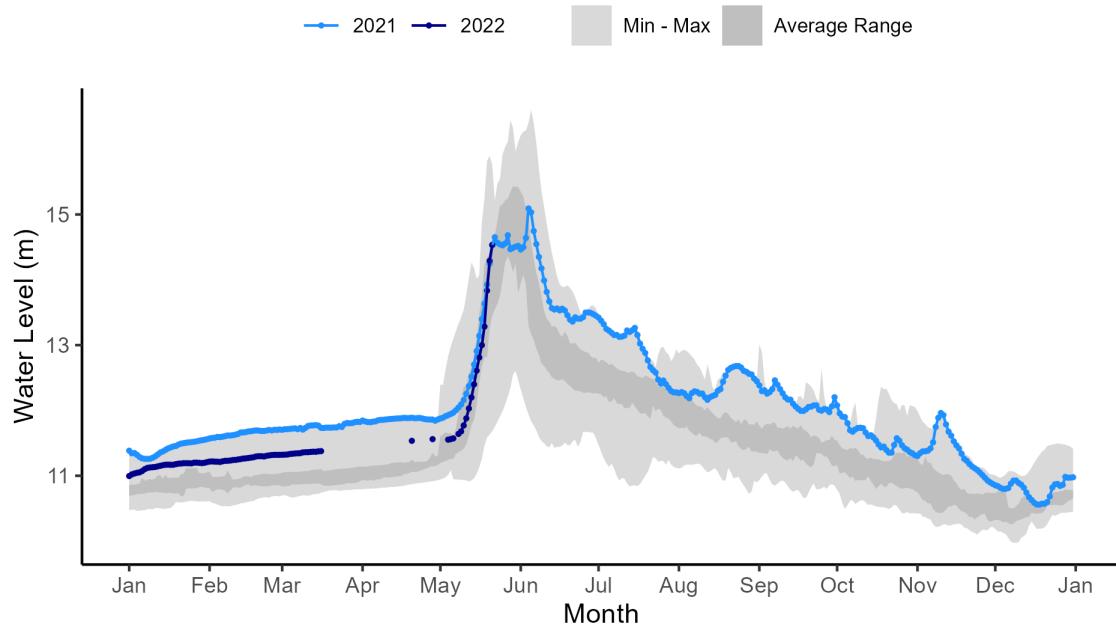


Above – The middle graph in the figure presents real time water level data at 5-minute resolution while the lower graph shows daily average levels relative to the previous 20 years. Water levels in the Mackenzie Delta continue to rise at a normal rate for this time of year.



Above – Mackenzie River above Aklavik hydrometric gauge photo from May 21 at 13:30. Photo courtesy of Water Survey of Canada and GNWT.

Mackenzie River (Middle Channel) below Raymond Channel [10MC008]:
MACKENZIE RIVER (MIDDLE CHANNEL) BELOW RAYMOND CHANNEL



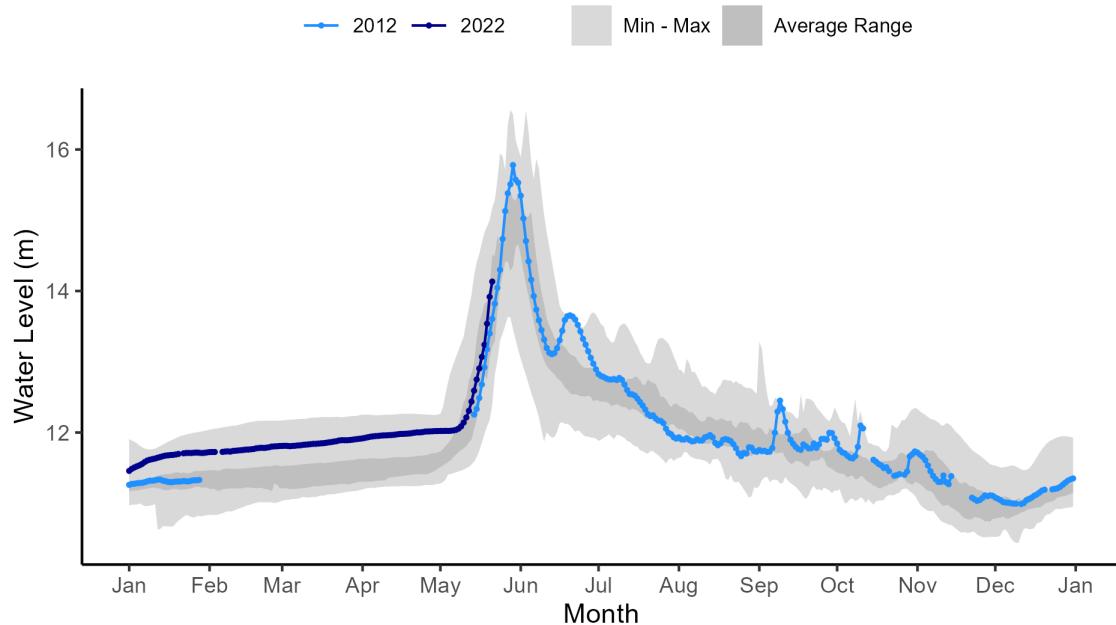
Above – The middle graph in the figure presents real time water level data at 5-minute resolution while the lower graph shows daily average levels relative to the previous 20 years. Water levels at this location in the Mackenzie Delta rose rapidly yesterday (May 21), likely due to ice movement, and stabilised overnight. Water levels are within the normal range for this time of year.

10MC008 2022-05-22 15:01:14 UTC
68.29235, -134.42966 13.0V 15°C P



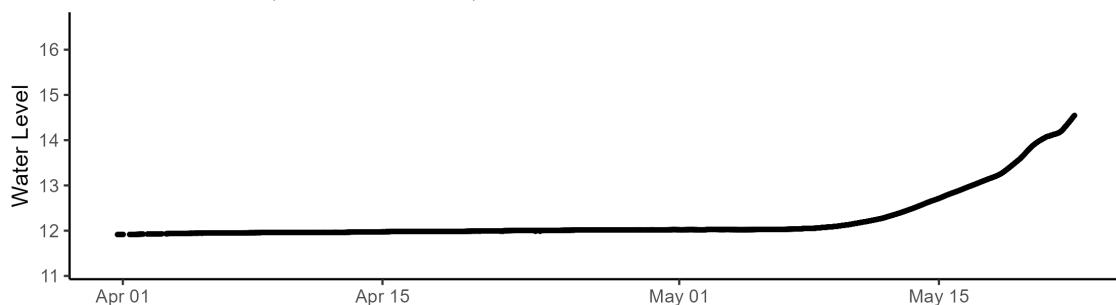
Above – Mackenzie River below Raymond Channel hydrometric gauge photo from May 22 at 09:00. Photo courtesy of Water Survey of Canada and GNWT.

Mackenzie River (East Channel) at Inuvik [10LC002]:
MACKENZIE RIVER (EAST CHANNEL) AT INUVIK (10LC002)

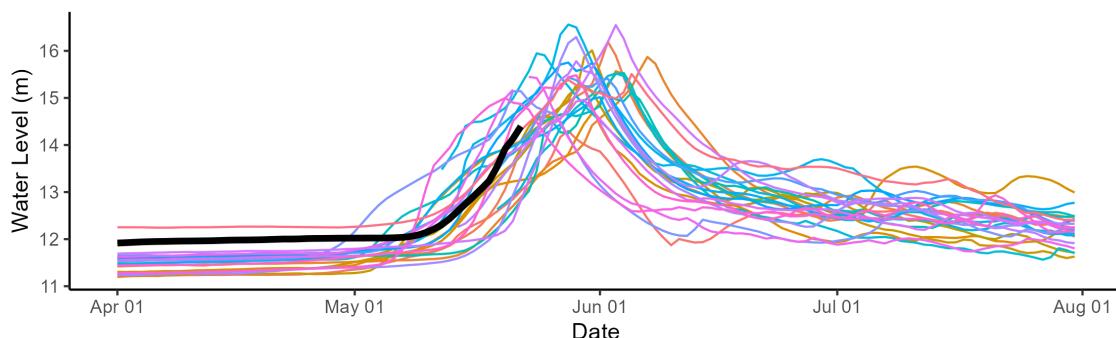


MACKENZIE RIVER (EAST CHANNEL) AT INUVIK (10LC002)

2022 Water Levels (5 minute resolution)

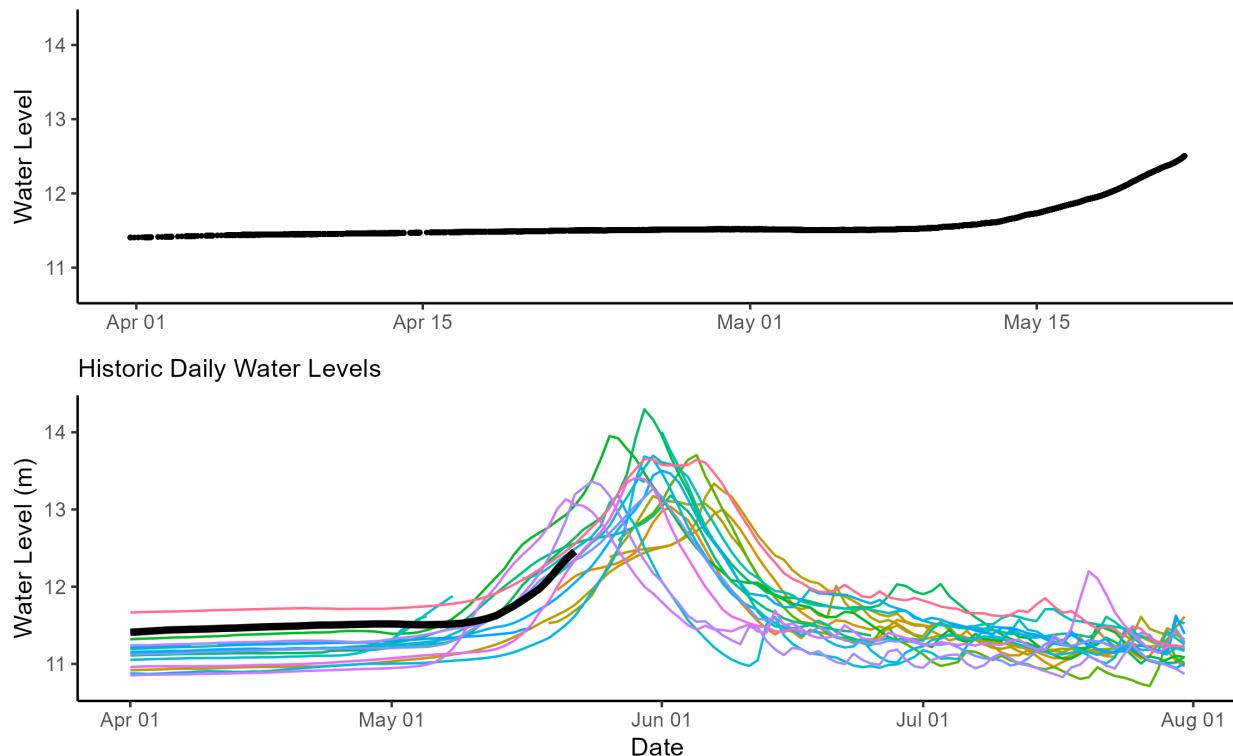


Historic Daily Water Levels



Above – The middle graph in the figure presents real time water level data at 5-minute resolution while the lower graph shows daily average levels relative to the previous 20 years. Water levels in the Mackenzie Delta continue to rise at normal rates for this time of year.

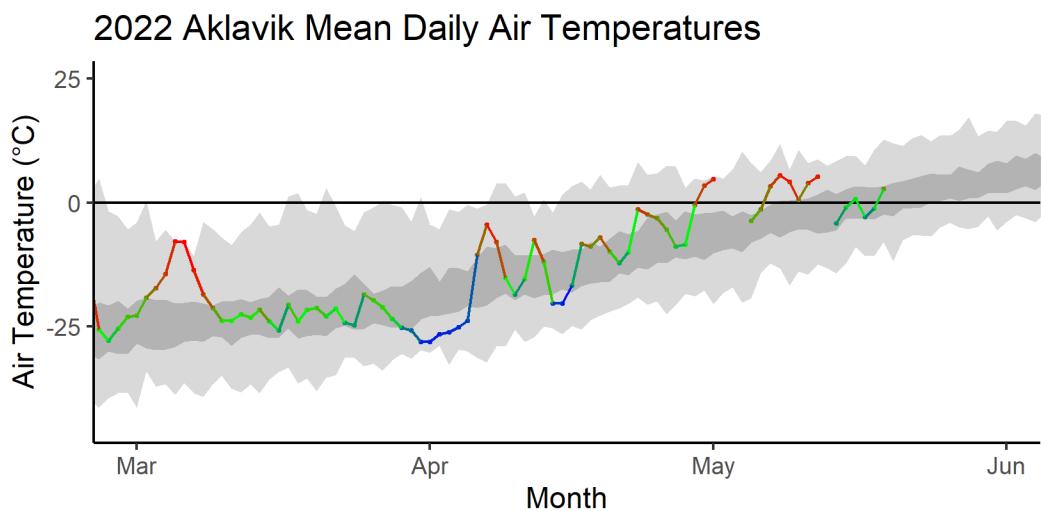
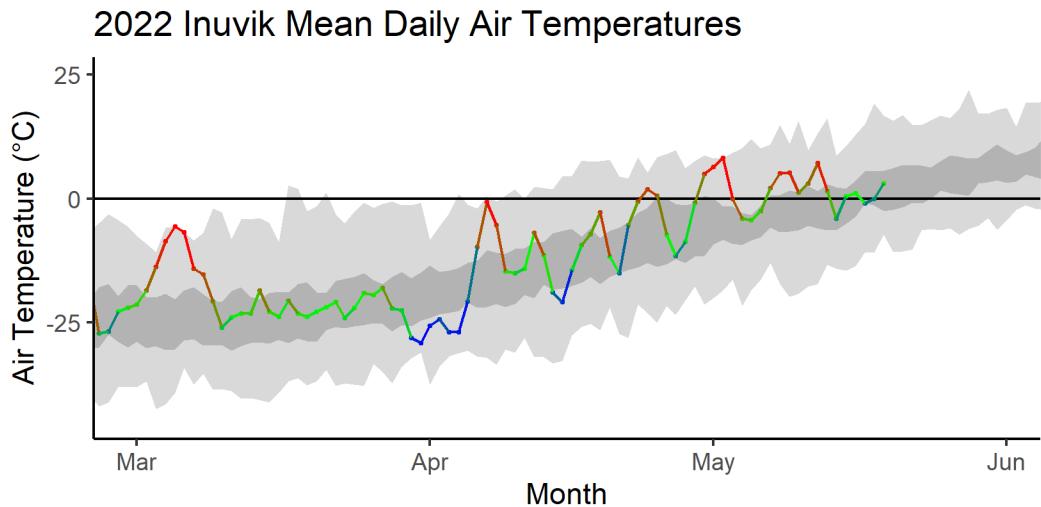
Mackenzie River (Napoiaik Channel) above Shallow Bay [10MC023]:
MACKENZIE RIVER (NAPOIAK CHANNEL) ABOVE SHALLOW BAY (10MC023)
2022 Water Levels (5 minute resolution)



Above – The top graph in the figure presents real time water level data at 5-minute resolution while the lower graph shows daily average levels relative to the previous 20 years. Water levels in the Mackenzie Delta continue to rise at normal rates for this time of year.

Weather Data:

Weather information informs how snow and ice will melt and provides information about how this spring is unfolding relative to previous springs. Locations included here cover basin areas that feed into NWT rivers that are currently undergoing break up. The first set of plots 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.



Inuvik seven-day weather forecast:

Sun 22 May	Mon 23 May	Tue 24 May	Wed 25 May	Thu 26 May	Fri 27 May	Sat 28 May
 1°C 30% Chance of flurries	 6°C A mix of sun and cloud	 12°C Sunny	 13°C A mix of sun and cloud	 15°C Sunny	 11°C A mix of sun and cloud	 11°C A mix of sun and cloud
Tonight	Night	Night	Night	Night	Night	
 -7°C Mainly cloudy	 -3°C Sunny	 1°C A mix of sun and cloud	 3°C Sunny	 1°C A mix of sun and cloud	 -1°C A mix of sun and cloud	

Aklavik seven-day weather forecast:

Sun 22 May	Mon 23 May	Tue 24 May	Wed 25 May	Thu 26 May	Fri 27 May	Sat 28 May
 1°C 60% Chance of flurries	 5°C A mix of sun and cloud	 12°C Sunny	 13°C A mix of sun and cloud	 15°C Sunny	 7°C A mix of sun and cloud	 6°C A mix of sun and cloud
Tonight	Night	Night	Night	Night	Night	
 -6°C Mainly cloudy	 -2°C Sunny	 1°C A mix of sun and cloud	 3°C Sunny	 1°C A mix of sun and cloud	 -1°C A mix of sun and cloud	

Fort McPherson seven-day weather forecast:

Sun 22 May	Mon 23 May	Tue 24 May	Wed 25 May	Thu 26 May	Fri 27 May	Sat 28 May
 2°C 30% Chance of flurries	 8°C A mix of sun and cloud	 13°C Sunny	 13°C A mix of sun and cloud	 16°C Sunny	 8°C A mix of sun and cloud	 8°C A mix of sun and cloud
Tonight	Night	Night	Night	Night	Night	
 -7°C Mainly cloudy	 -2°C Clear	 1°C Clear	 2°C Clear	 1°C Cloudy periods	 1°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.