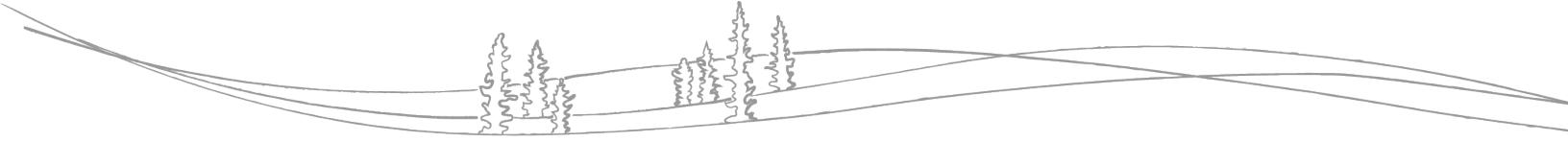




NWT Water Monitoring Bulletin

– May 25, 2022: 11:00



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 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.

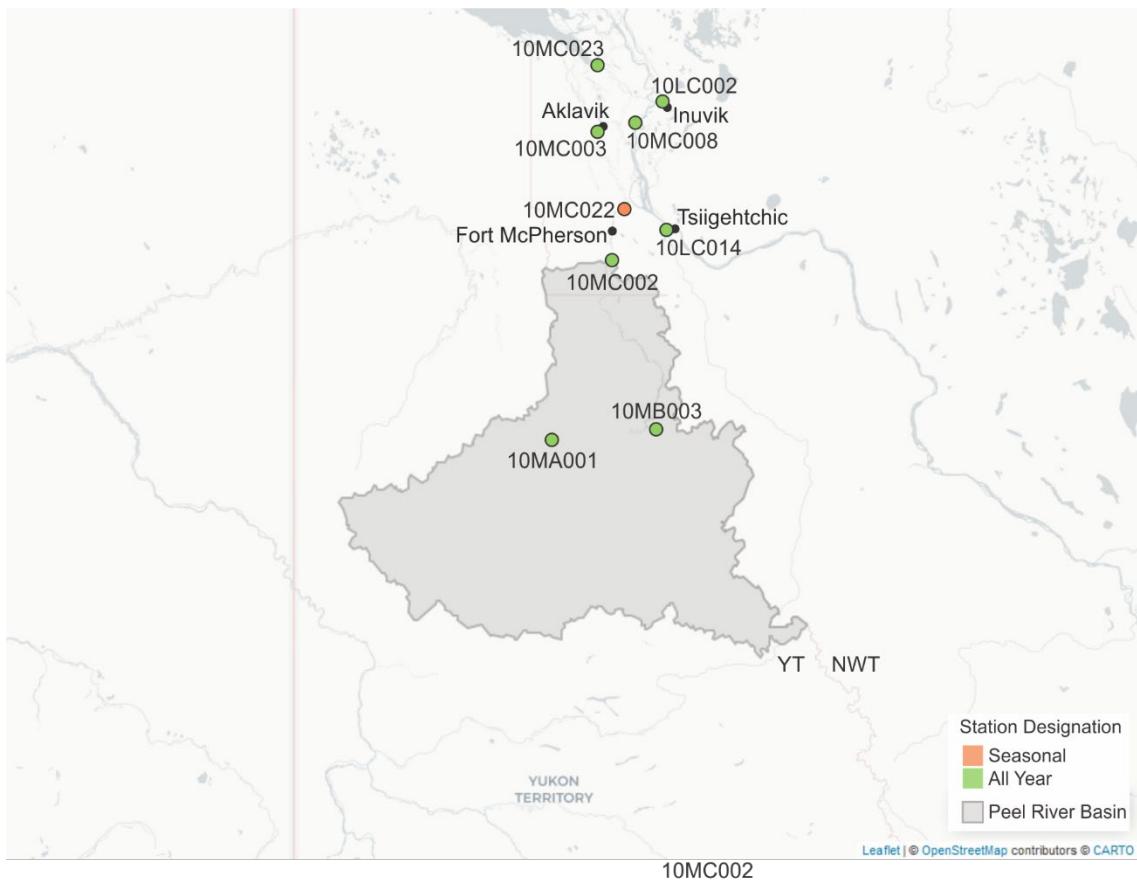
Current Status:

- The ice jam on the Mackenzie River appears to have released at Tsiigehtchic, and the head (upstream end) of the ice jam is now at Point Separation;
 - Ice and water from the large jam are expected to have moved downstream and into the Delta;
 - Although hydrometric data are still unavailable at the Mackenzie River at Arctic Red River gauge, there are reports of water levels having receded at the ferry crossing;
 - We will be monitoring gauges, photos, and satellite imagery to track the progression of the ice front.
- Water levels under ice continue to increase in the Mackenzie River Delta, at normal rates for this time of year;
 - Water levels at Aklavik are at 13.7 m (maximum from last year was 15.539 m).
 - Water levels at Inuvik are 15.0 m (maximum from last year was 15.561 m).
- Water levels on the Peel River at Fort McPherson are slowly dropping and appear to have reached their ice-induced peak after rising on the weekend.

Contents

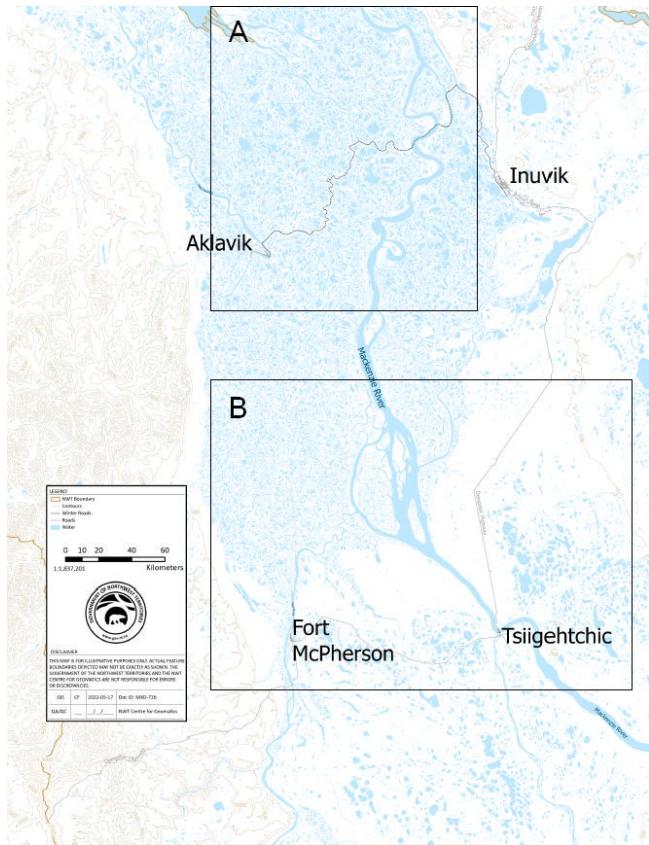
Current Status:	1
Peel River and Beaufort Delta	3
Imagery:	4
Hydrometric Data:	6
Mackenzie River at Arctic Red River [10LC014]:.....	6
Peel River at Fort McPherson [10MC002]:.....	7
Mackenzie River (Peel Channel) at Aklavik [10MC003]:	9
Mackenzie River (Middle Channel) below Raymond Channel [10MC008]:.....	11
Mackenzie River (East Channel) at Inuvik [10LC002]:.....	12
Mackenzie River (Napoiaq Channel) above Shallow Bay [10MC023]:	13
Weather Data:	14
Factors to Watch:	16
Spring Break up on NWT Rivers: Mechanical vs Thermal	16

Peel River and Beaufort Delta

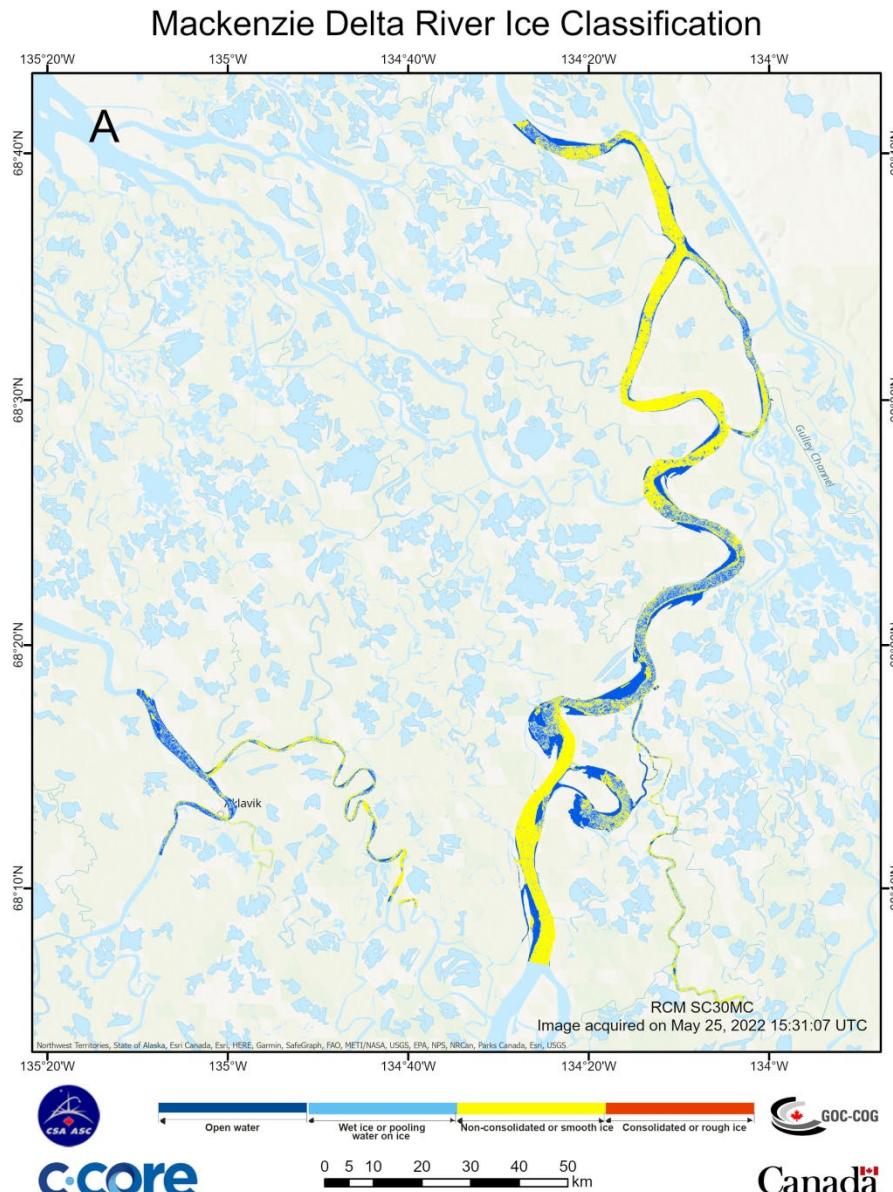


Above – Map of select hydrometric stations in the Peel River basin and the Beaufort Delta. The station numbers are referenced in the water level plots below.

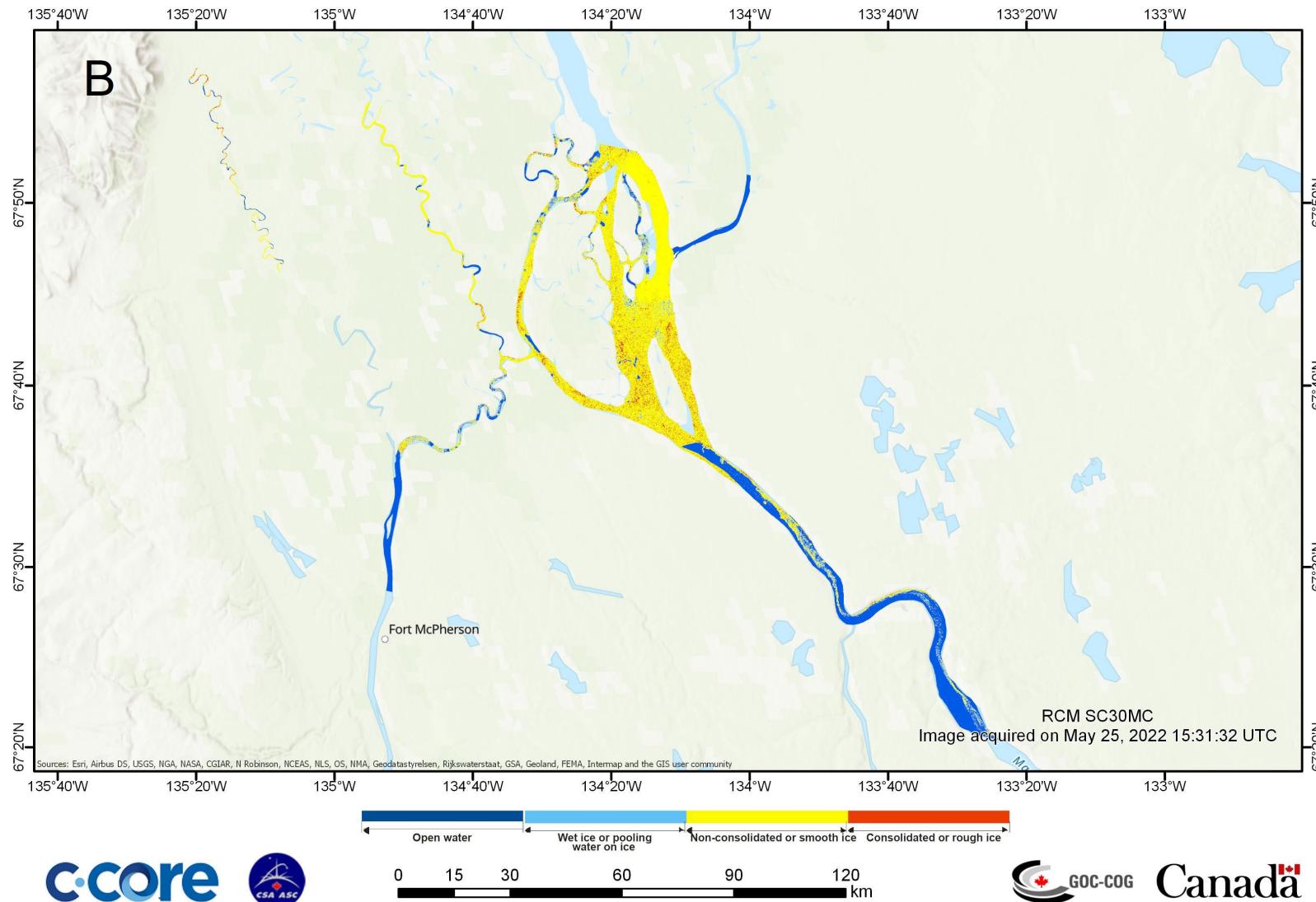
Imagery:



Right (A) and next page (B) – Ice classification maps based on radar imagery of the Mackenzie Delta. Taken on 25th May at 09:31 MDT.



Mackenzie Delta River Ice Classification



Hydrometric Data:

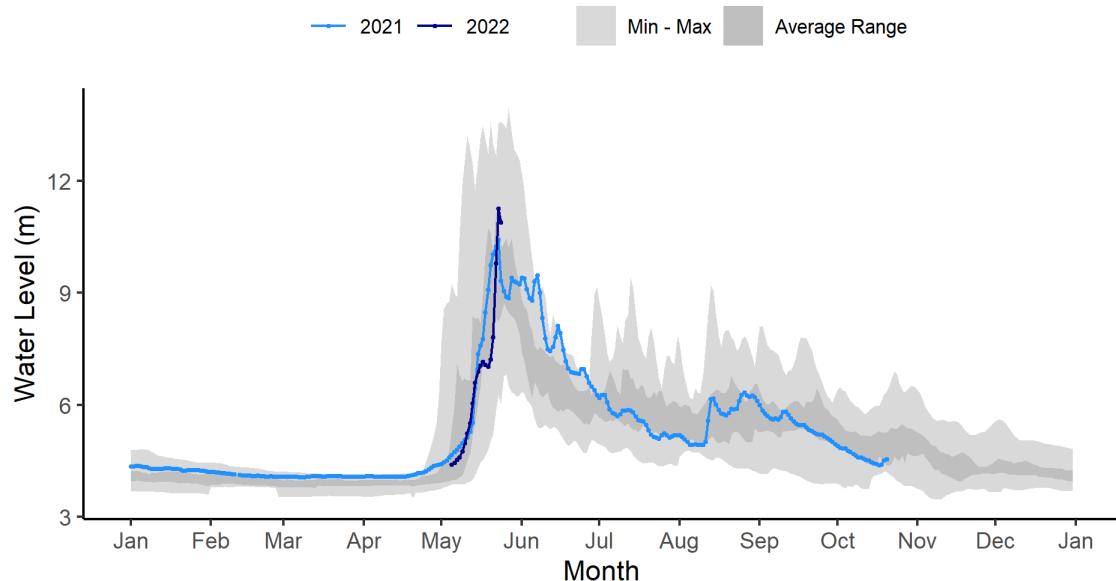
Mackenzie River at Arctic Red River [10LC014]:

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



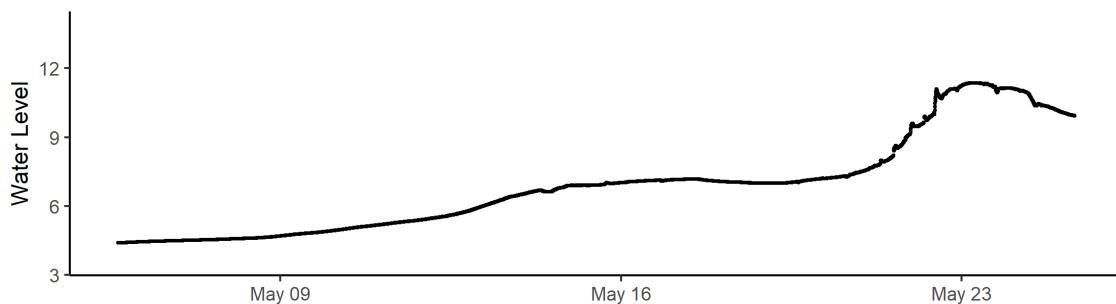
Above – Mackenzie River at Arctic Red River hydrometric gauge photo from May 25 at 07:00. Photo courtesy of Water Survey of Canada and GNWT.

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

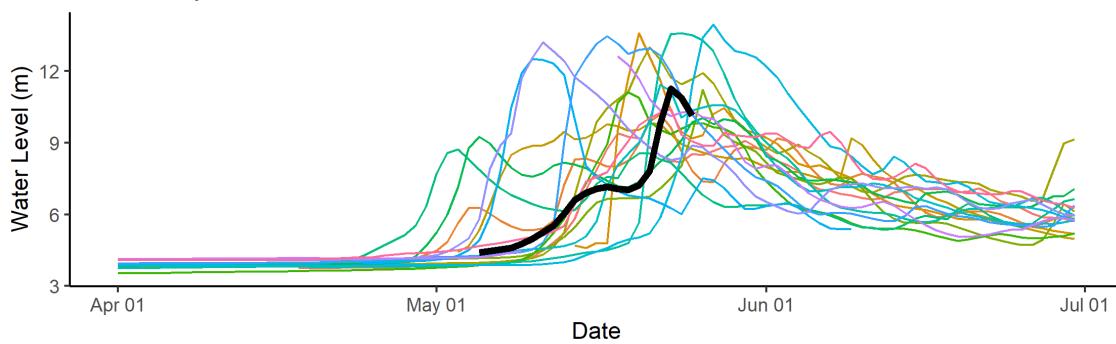


PEEL RIVER ABOVE FORT MCPHERSON (10MC002)

2022 Water Levels (5 minute resolution)



Historic Daily Water Levels

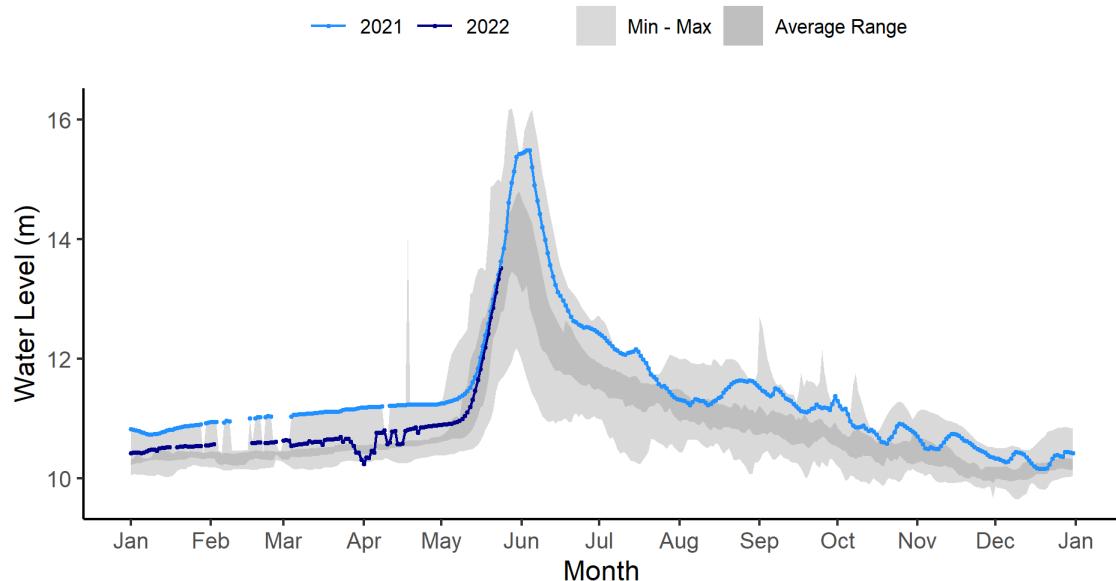


Above – The middle graph in the figure presents real time water level data at 5-minute resolution while the lower graph shows daily average levels relative to the previous 20 years. Water levels are now declining from an ice-induced peak over the weekend.

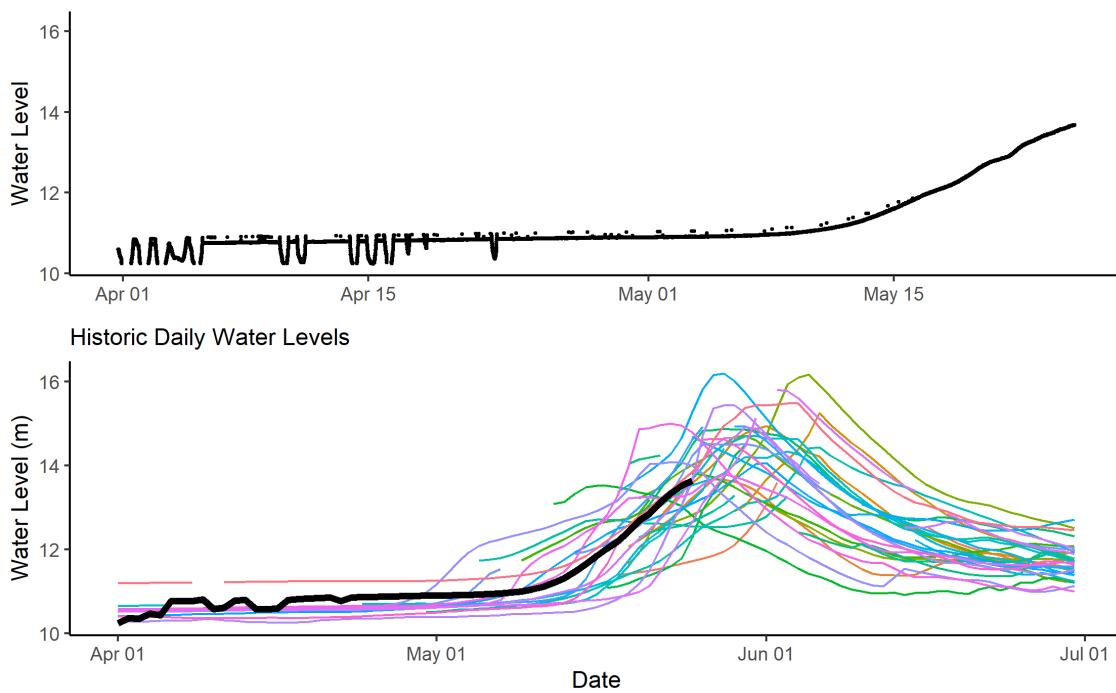


Above – Peel River at Fort McPherson hydrometric gauge photo from May 24 at 12:00. Photo courtesy of Water Survey of Canada and GNWT.

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



MACKENZIE RIVER (PEEL CHANNEL) ABOVE AKLAVIK (10MC003)
2022 Water Levels (5 minute resolution)

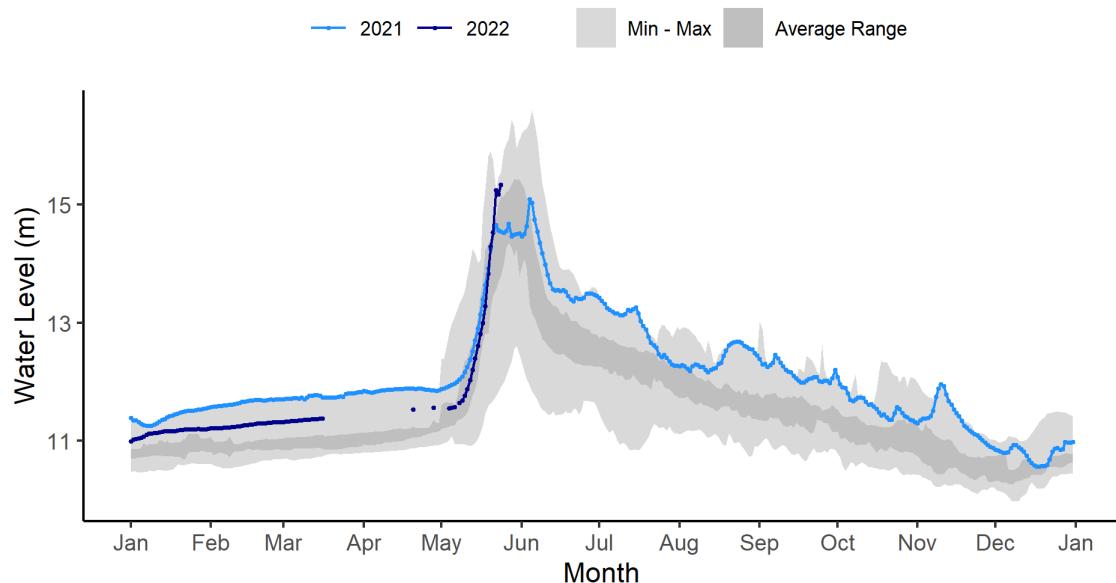


Above – The middle graph in the figure presents real time water level data at 5-minute resolution while the lower graph shows daily average levels relative to the previous 20 years. Water levels in the Mackenzie Delta continue to rise at a normal rate for this time of year.

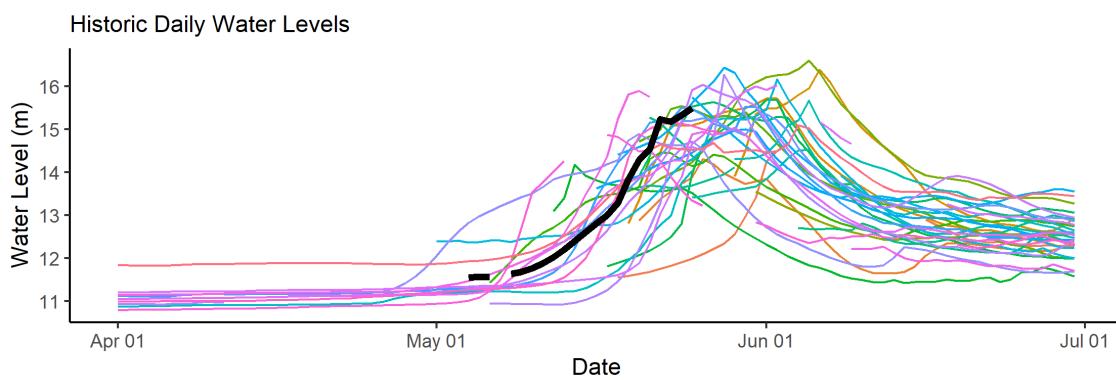
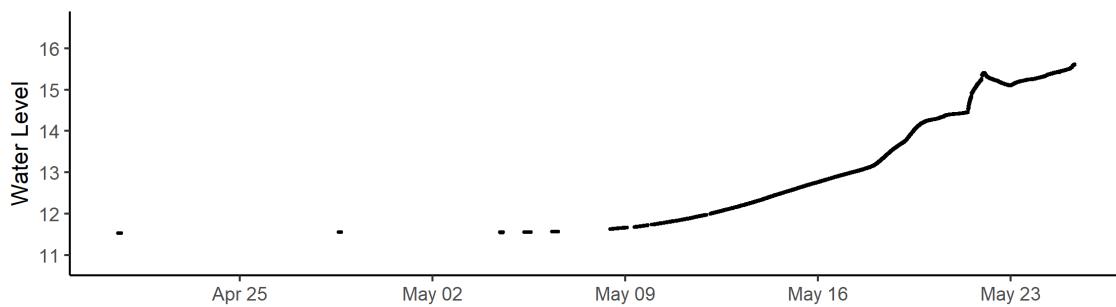


Above – Mackenzie River above Aklavik hydrometric gauge photo from May 24 at 14:00. Photo courtesy of Water Survey of Canada and GNWT.

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

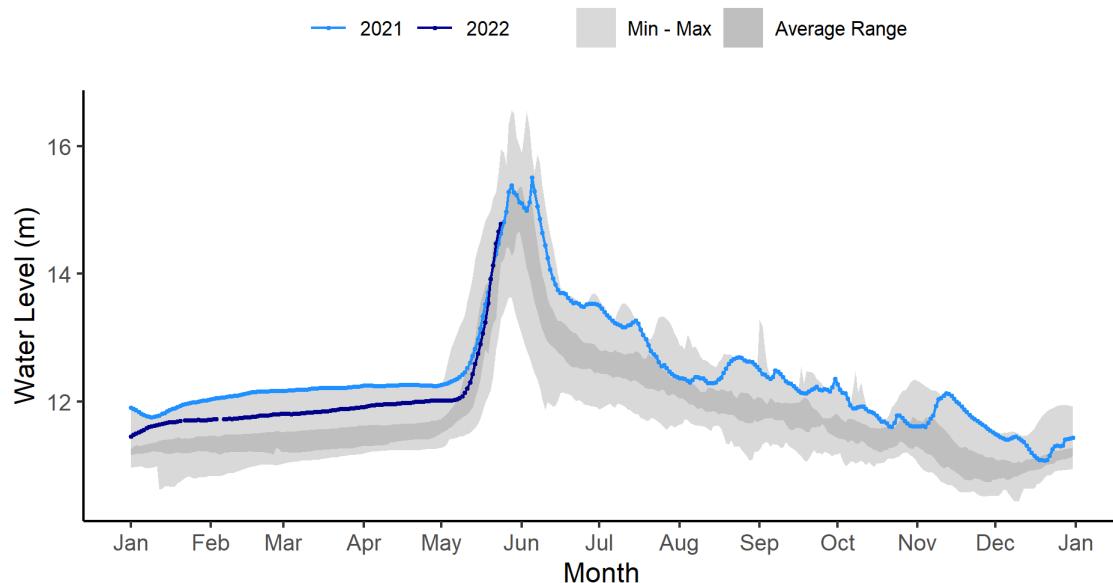


MACKENZIE RIVER (MIDDLE CHANNEL) BELOW RAYMOND CHANNEL (10MC008)
2022 Water Levels (5 minute resolution)

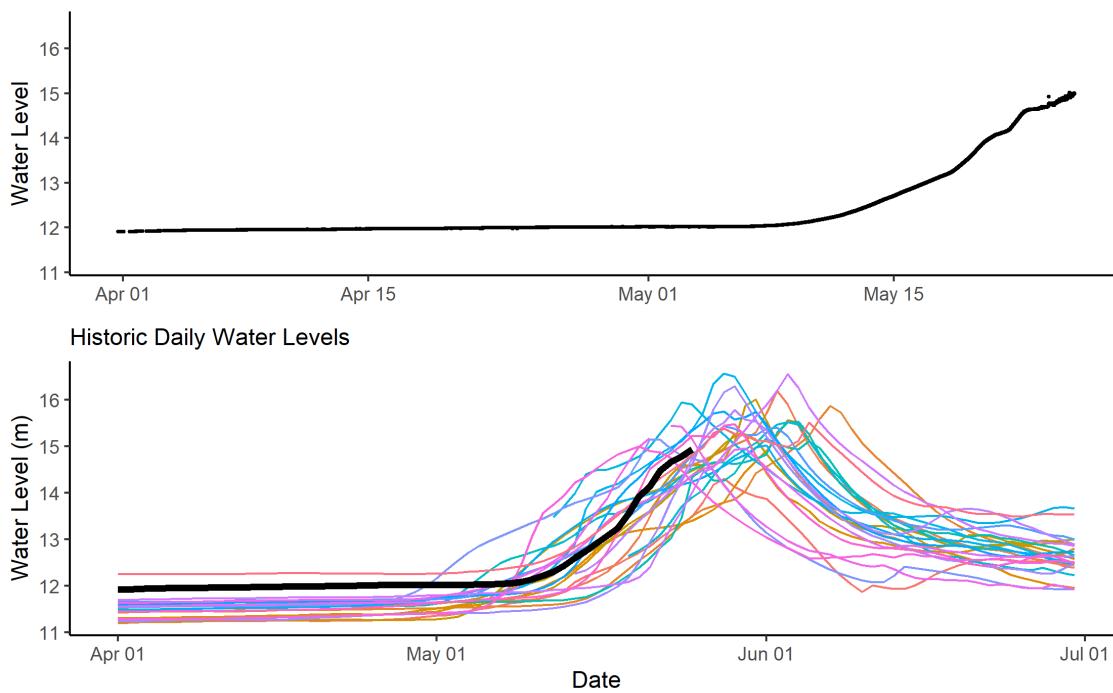


Above – The middle graph in the figure presents real time water level data at 5-minute resolution while the lower graph shows daily average levels relative to the previous 20 years.

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)

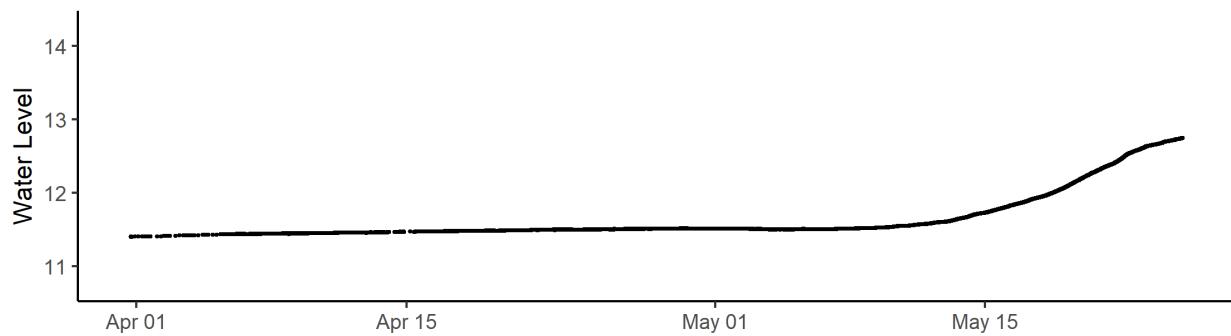


Above – The middle graph in the figure presents real time water level data at 5-minute resolution while the lower graph shows daily average levels relative to the previous 20 years. Water levels in the Mackenzie Delta continue to rise at normal rates for this time of year.

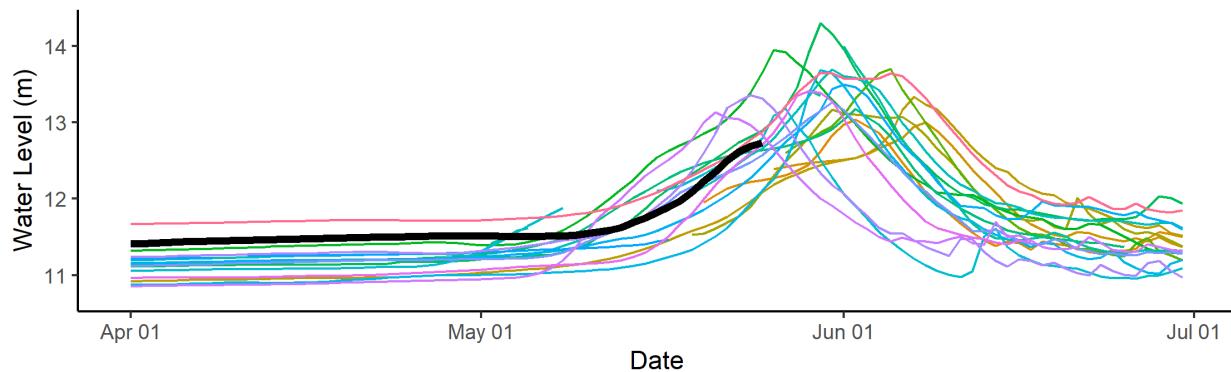
Mackenzie River (Napoiaik Channel) above Shallow Bay [10MC023]:

MACKENZIE RIVER (NAPOIAK CHANNEL) ABOVE SHALLOW BAY (10MC023)

2022 Water Levels (5 minute resolution)



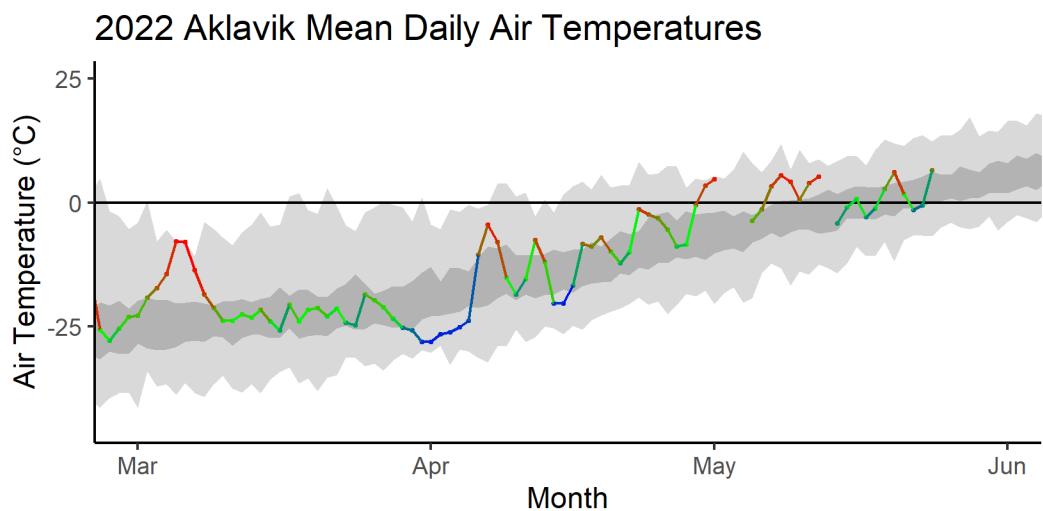
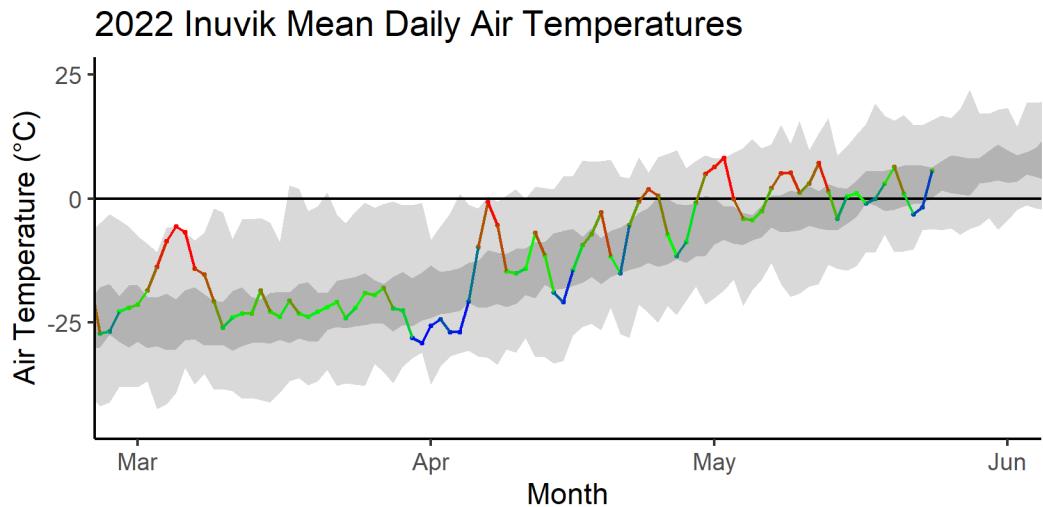
Historic Daily Water Levels



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:

Wed 25 May	Thu 26 May	Fri 27 May	Sat 28 May	Sun 29 May	Mon 30 May	Tue 31 May
 11°C A mix of sun and cloud	 8°C Increasing cloudiness	 5°C Cloudy	 10°C A mix of sun and cloud	 9°C A mix of sun and cloud	 12°C A mix of sun and cloud	 16°C A mix of sun and cloud
Tonight	Night	Night	Night	Night	Night	
 3°C Sunny	 0°C A mix of sun and cloud	 -2°C A mix of sun and cloud	 1°C Cloudy	 -1°C A mix of sun and cloud	 3°C A mix of sun and cloud	

Aklavik seven-day weather forecast:

Wed 25 May	Thu 26 May	Fri 27 May	Sat 28 May	Sun 29 May	Mon 30 May	Tue 31 May
 11°C A mix of sun and cloud	 8°C Increasing cloudiness	 5°C Cloudy	 9°C Cloudy	 9°C A mix of sun and cloud	 9°C A mix of sun and cloud	 11°C A mix of sun and cloud
Tonight	Night	Night	Night	Night	Night	
 2°C Sunny	 1°C A mix of sun and cloud	 1°C A mix of sun and cloud	 2°C Cloudy	 -1°C A mix of sun and cloud	 1°C A mix of sun and cloud	

Fort McPherson seven-day weather forecast:

Wed 25 May	Thu 26 May	Fri 27 May	Sat 28 May	Sun 29 May	Mon 30 May	Tue 31 May
 14°C A mix of sun and cloud	 14°C A mix of sun and cloud	 12°C A mix of sun and cloud	 15°C A mix of sun and cloud	 13°C A mix of sun and cloud	 11°C A mix of sun and cloud	 13°C A mix of sun and cloud
Tonight	Night	Night	Night	Night	Night	
 3°C Clear	 1°C Cloudy periods	 1°C A mix of sun and cloud	 2°C 60% Chance of showers	 1°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.