Government of
Northwest Territories

NWT Water Monitoring Bulletin – April 29

Break up reports will be published routinely as break up unfolds. The 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.

Contents

Current Status – NWT

- The initiation of spring break up is delayed relative to average break up times due to cooler than normal spring temperatures;
- Snowmelt is ongoing throughout the basins in the south of the NWT;
- Ice is starting to break up in the upper Hay River basin (AB/BC sections) and we are seeing a small initial rise in water levels;
- Water levels are beginning to rise slightly on the Liard River at Fort Liard;
- Environment and Climate Change Canada are forecasting an upper ridge to bring warm temperatures to the Hay and Liard basins beginning next Tuesday (May 3) and lasting through to the weekend. This warm weather will help to melt remaining snowpacks and expedite the melt of river ice.

Hay River

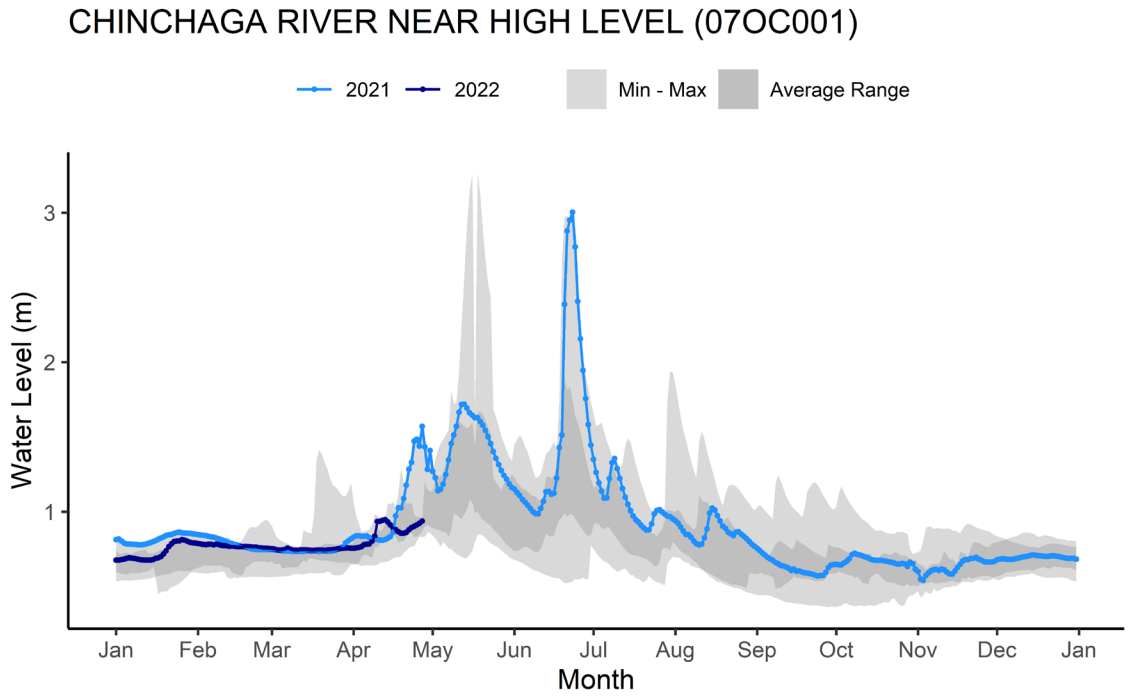
Current Status:

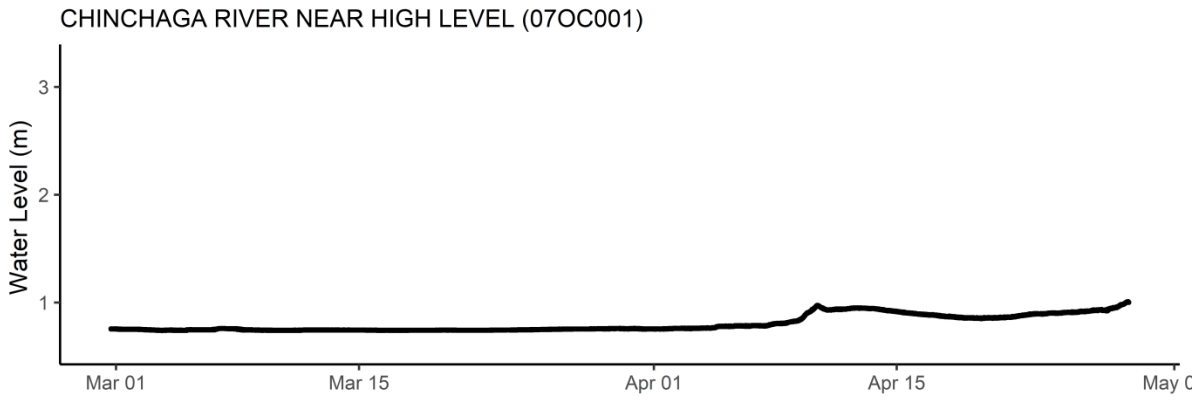
- Snow in the upper (southern) part of the basin is starting to melt;
- Water levels are beginning to rise, but the rate of increase is still small;
- Warm temperatures are forecast beginning early next week;
- Ice remains solid along the Hay River within the NWT.

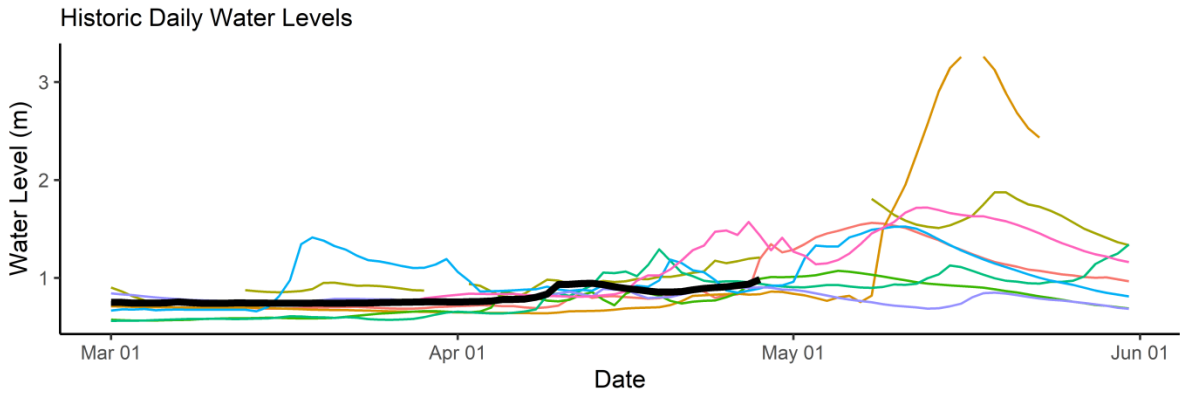
Map of hydrometric stations in the Hay River basin. The station numbers are referenced in the water level plots below.

Hydrometric Data:

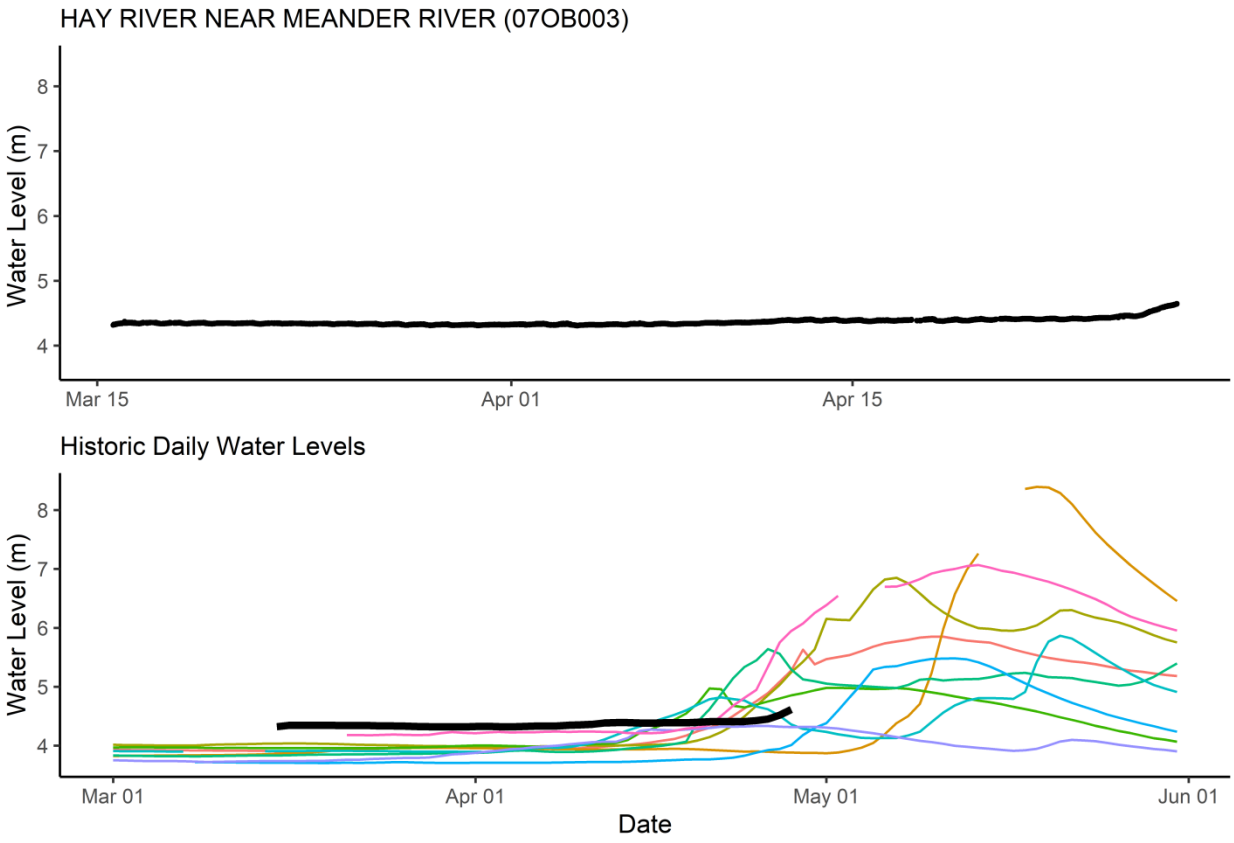
Chinchaga River near High Level (Alberta):



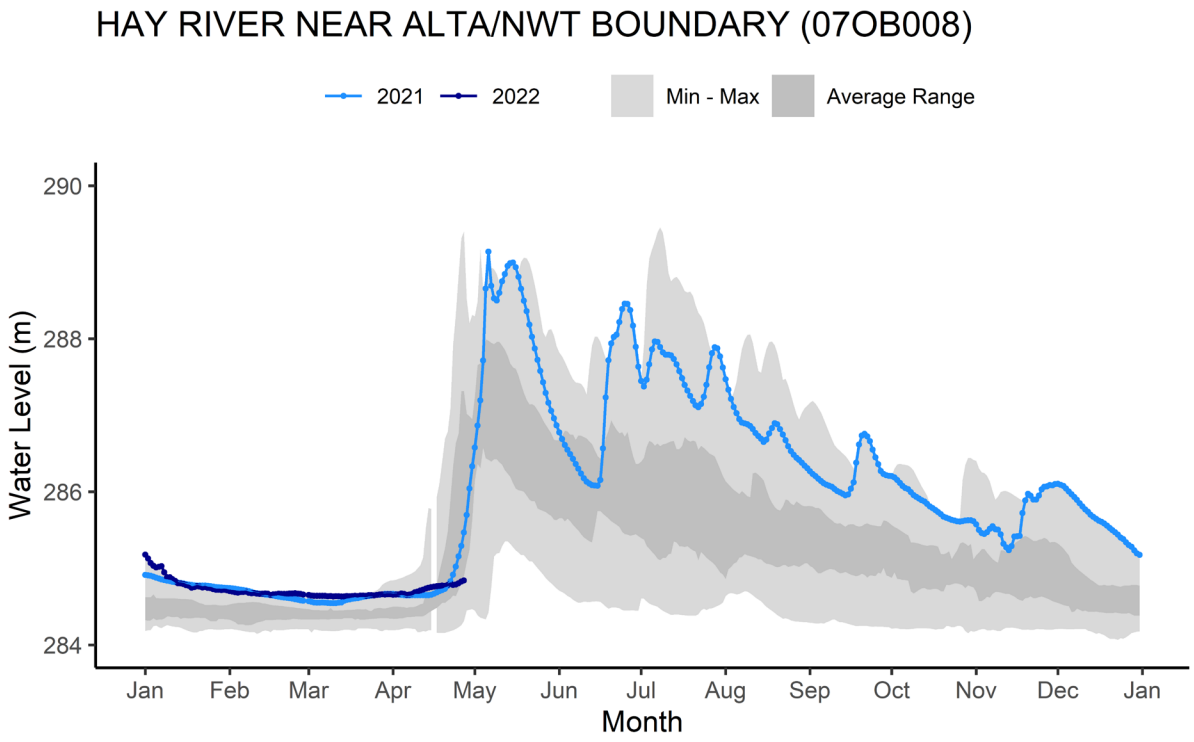


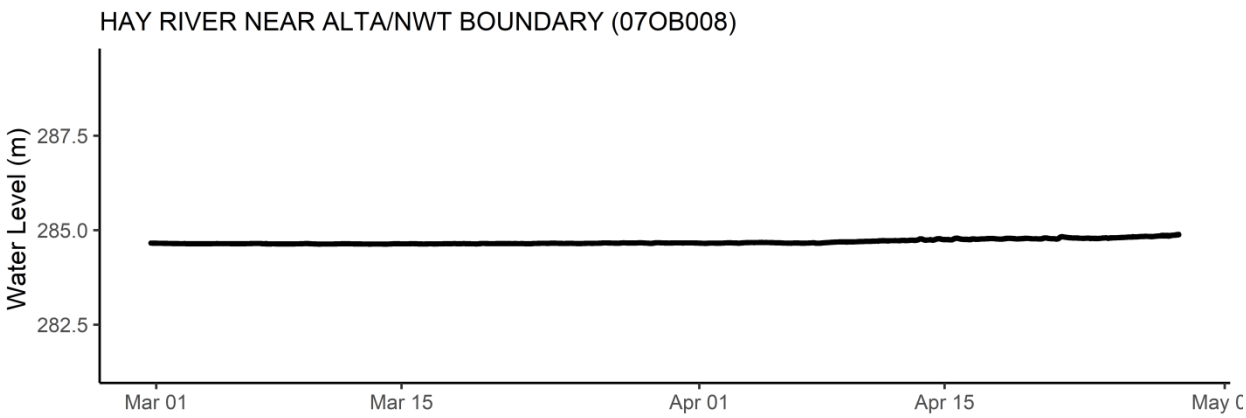


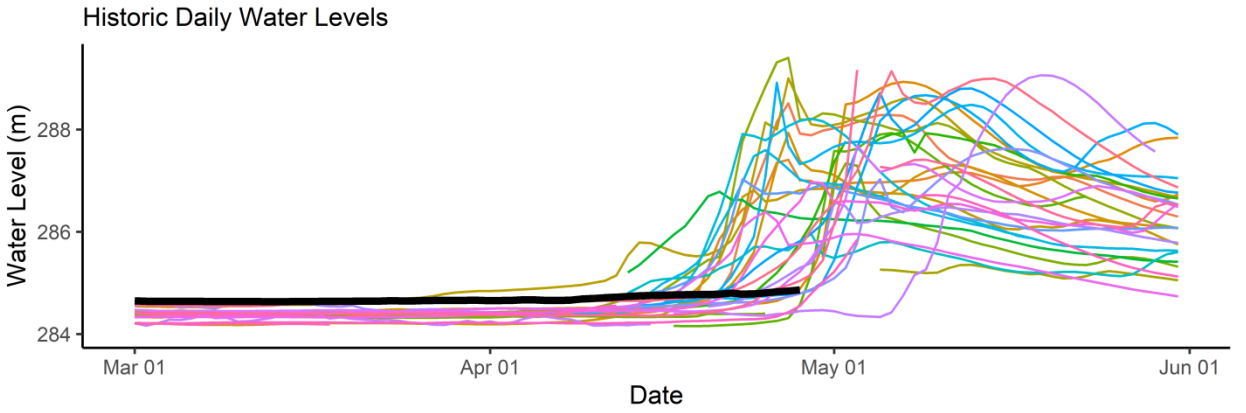
Hay River near Meander River (Alberta):



Hay River near the border:

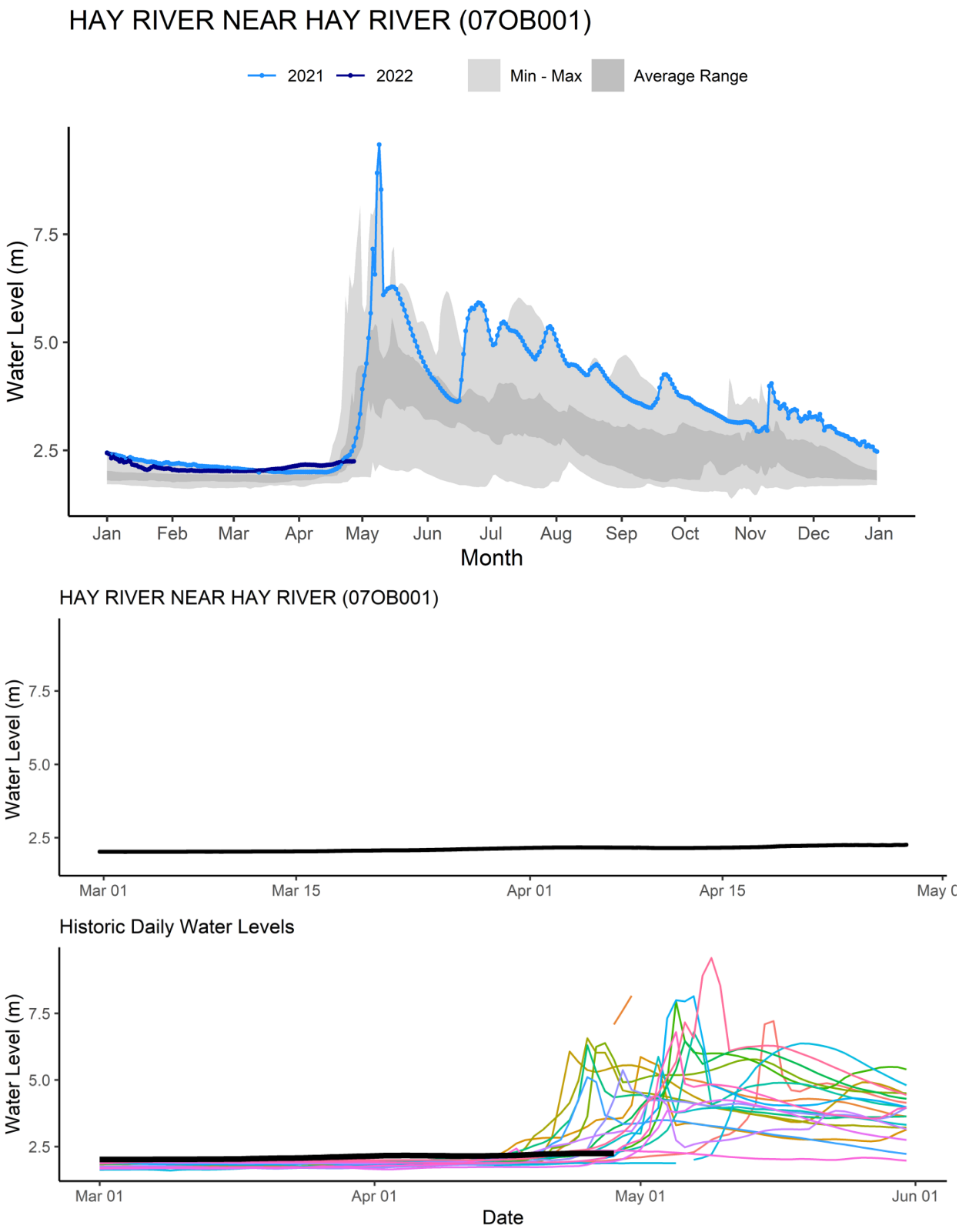






Hay River near the border hydrometric gauge photo, April 28th. Photo courtesy of Water Survey of Canada and GNWT.

Hay River near Hay River:



Hay River near the Town of Hay River hydrometric gauge photo, April 28th. Photo courtesy of Water Survey of Canada and GNWT.

Liard River:

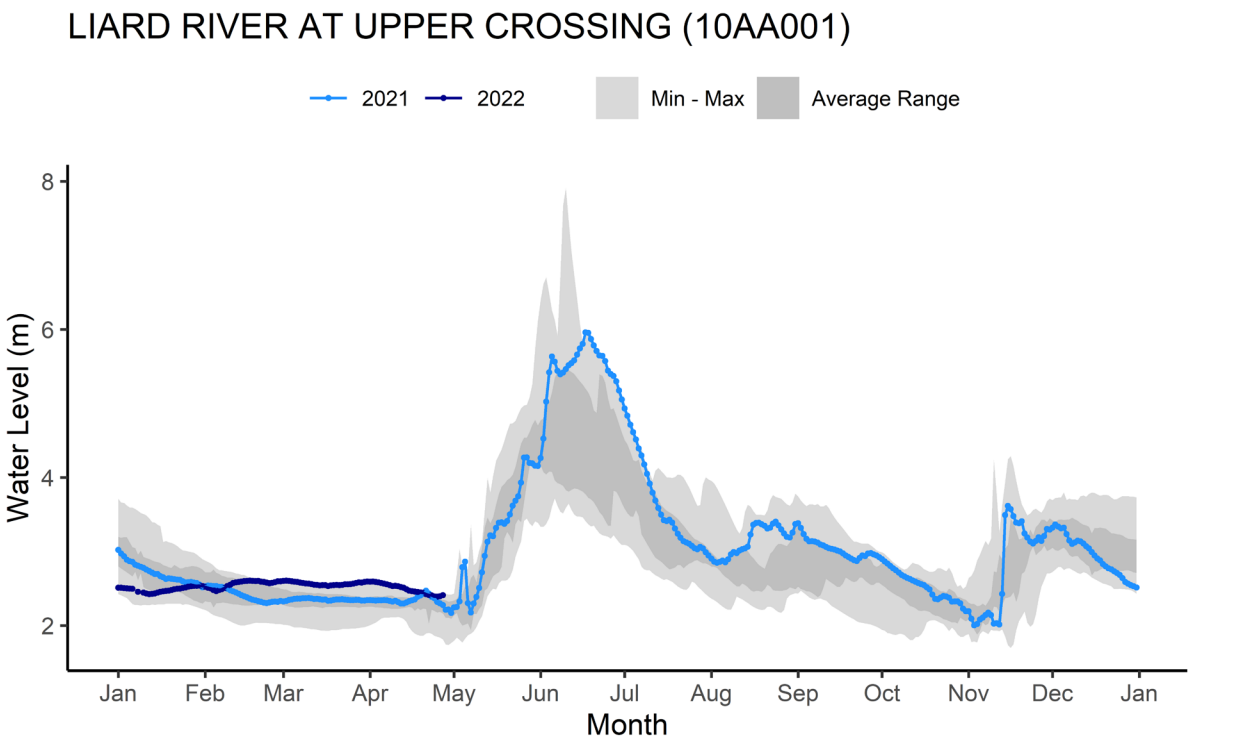
Current Status:

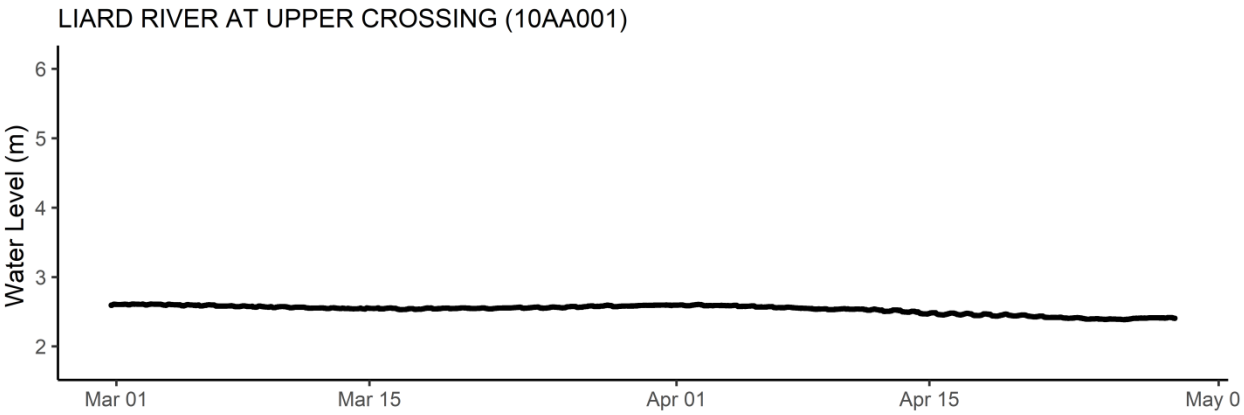
- Snowpack is beginning to melt across the basin;
- Ice remains solid along the Liard River within the NWT;
- Water levels are slowly beginning to rise underneath the ice at the Liard River at Fort Liard;
- Warm temperatures are forecast later beginning early next week.

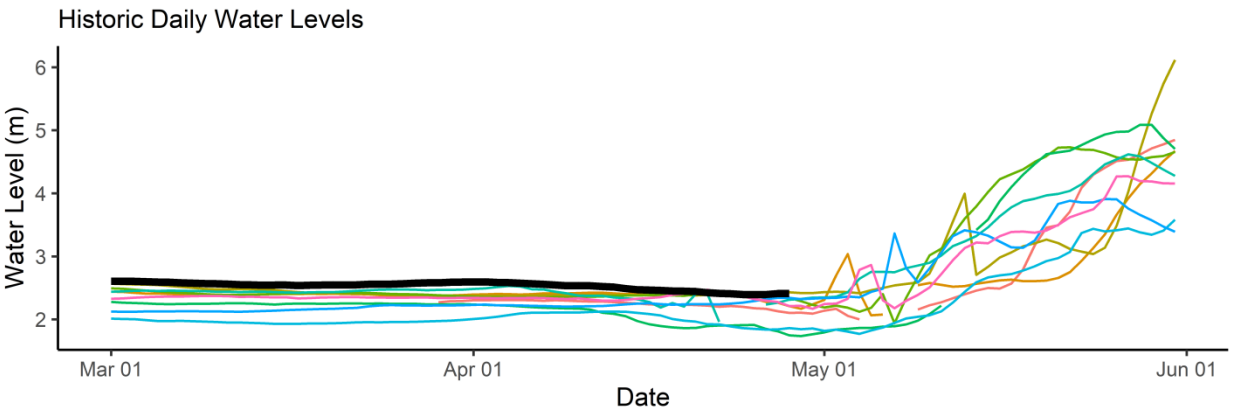
Map of hydrometric stations in the Liard River basin. The station numbers are referenced in the water level plots below.

Hydrometric Data:

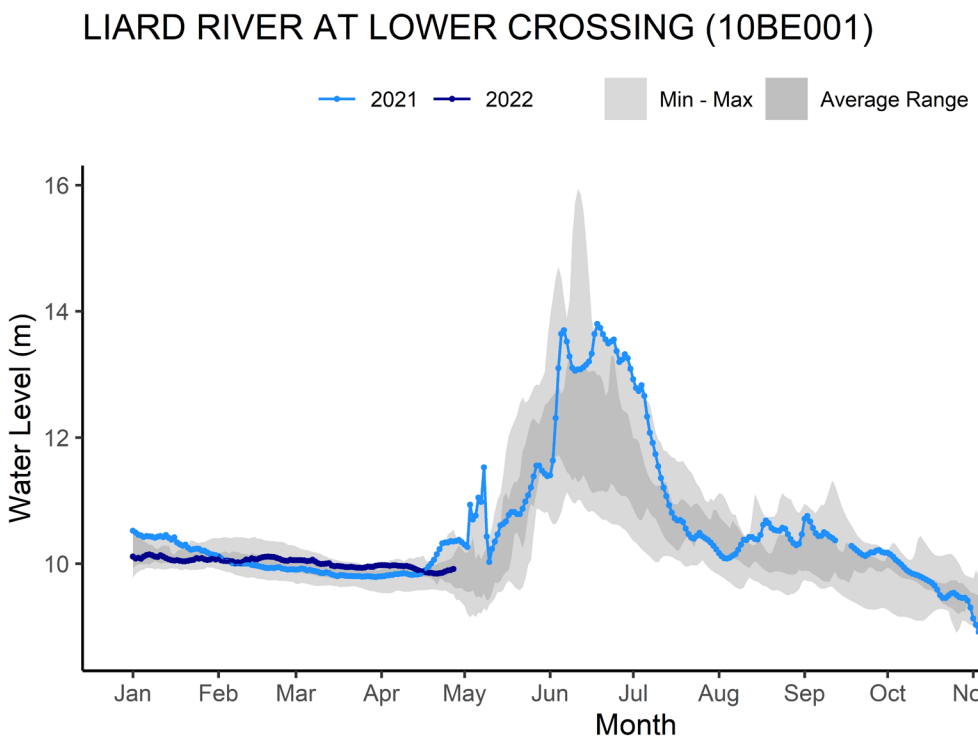
Liard River at Upper Crossing (Yukon):

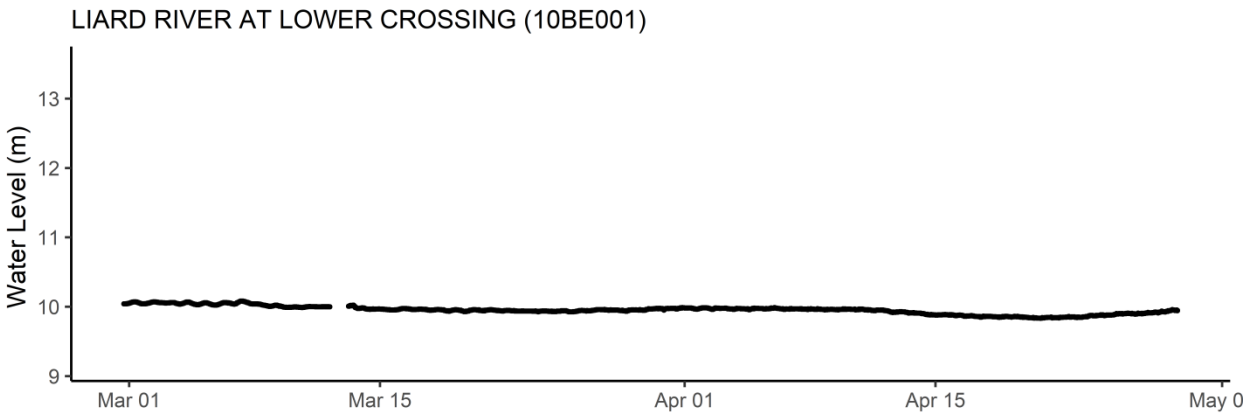


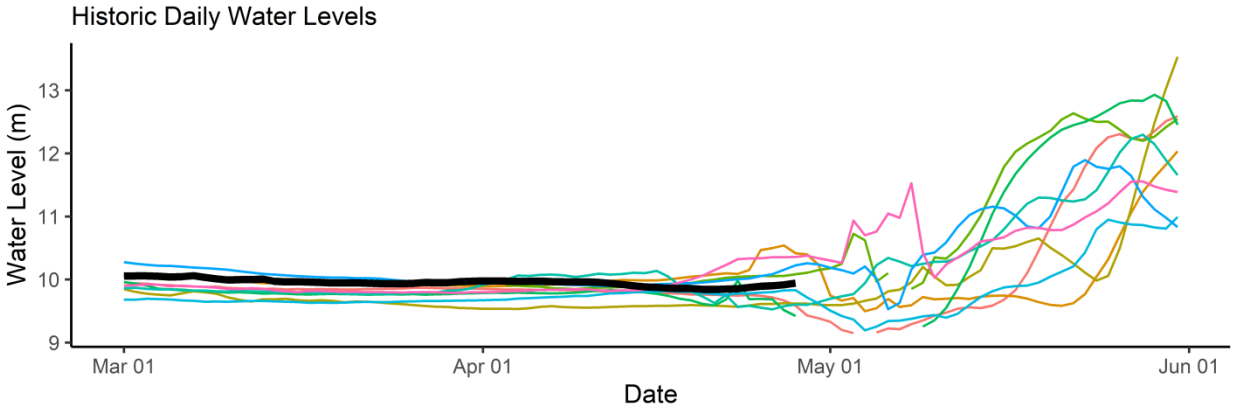




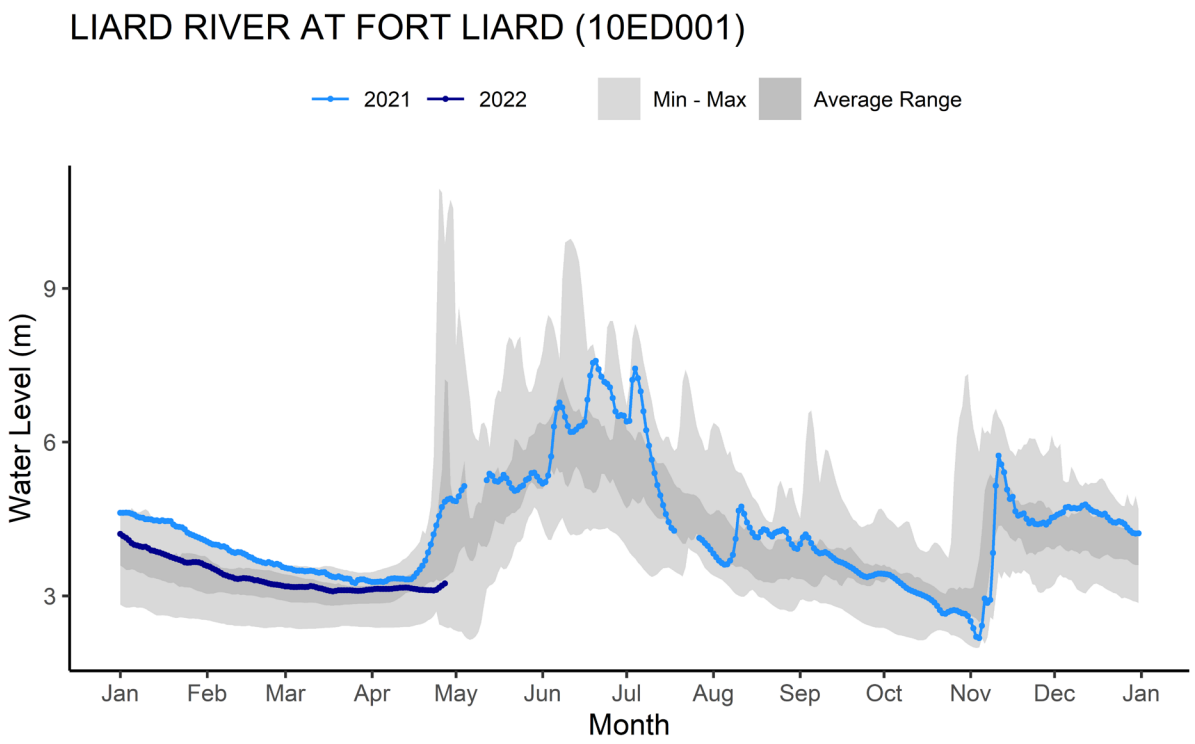
Liard River at Lower Crossing (British Columbia):

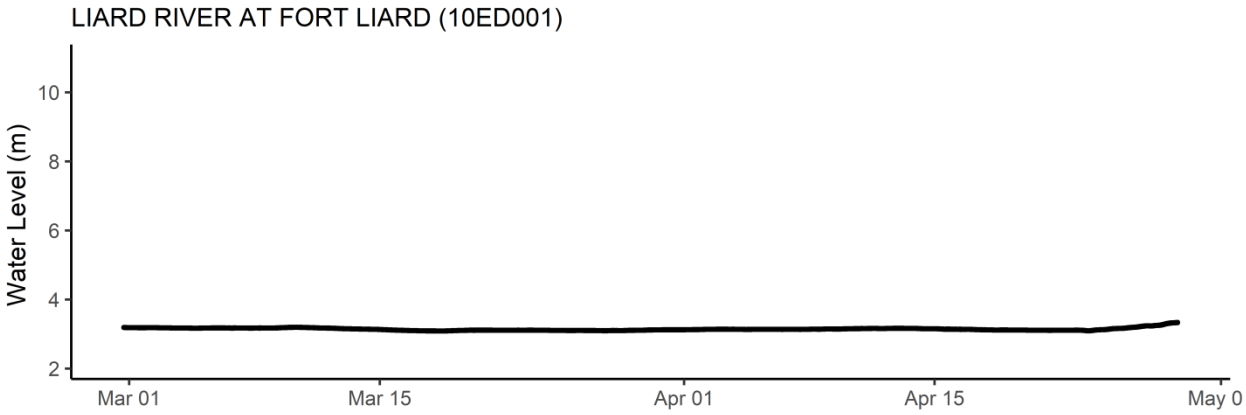


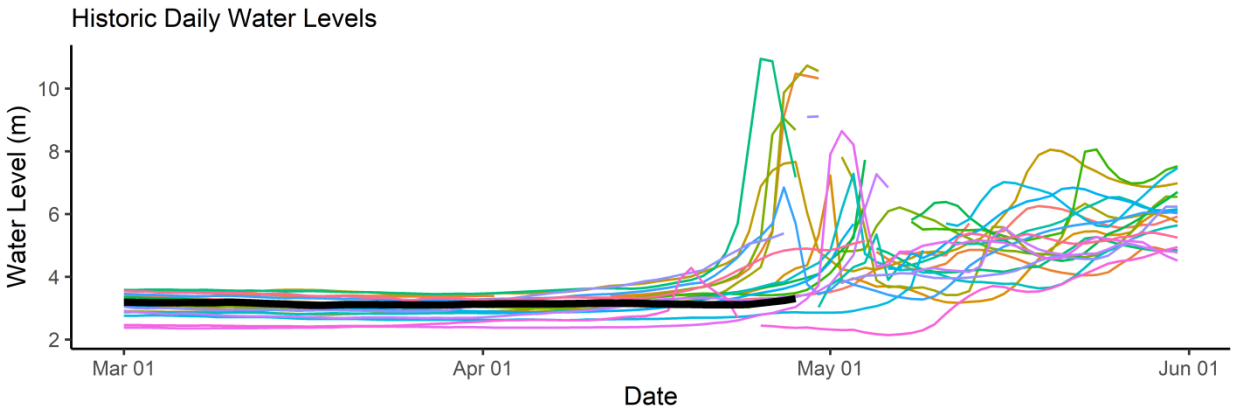




Liard River at Fort Liard:

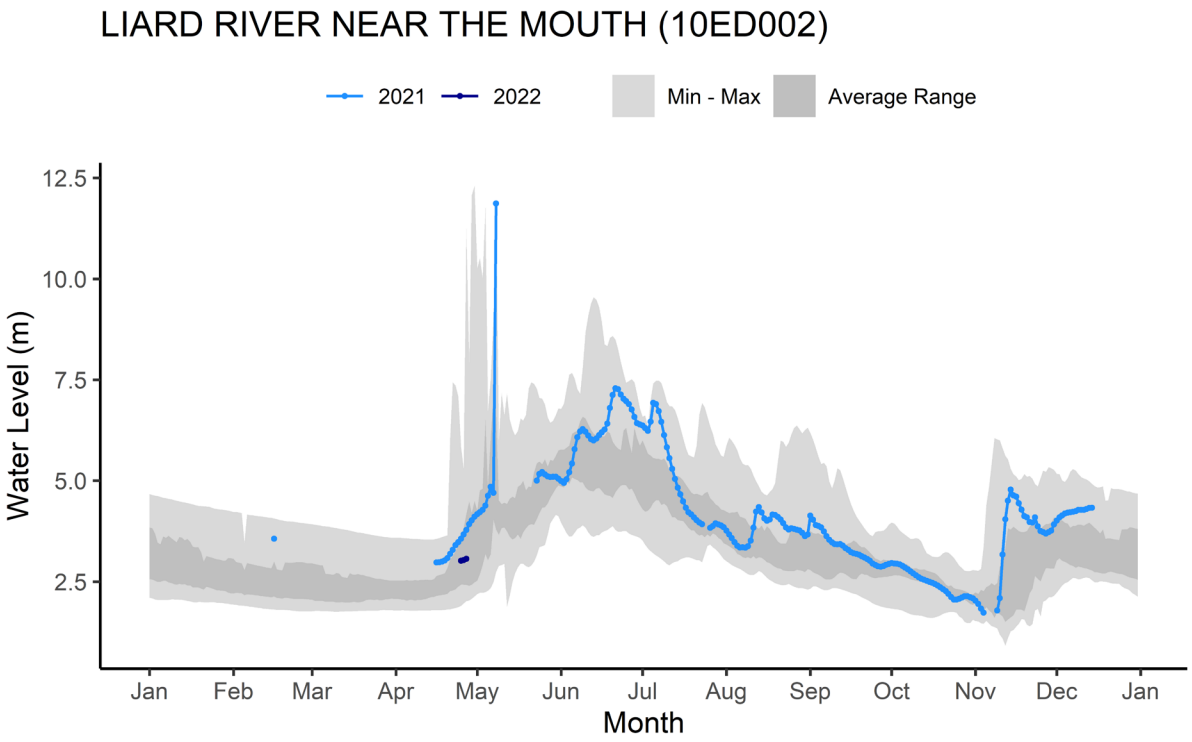


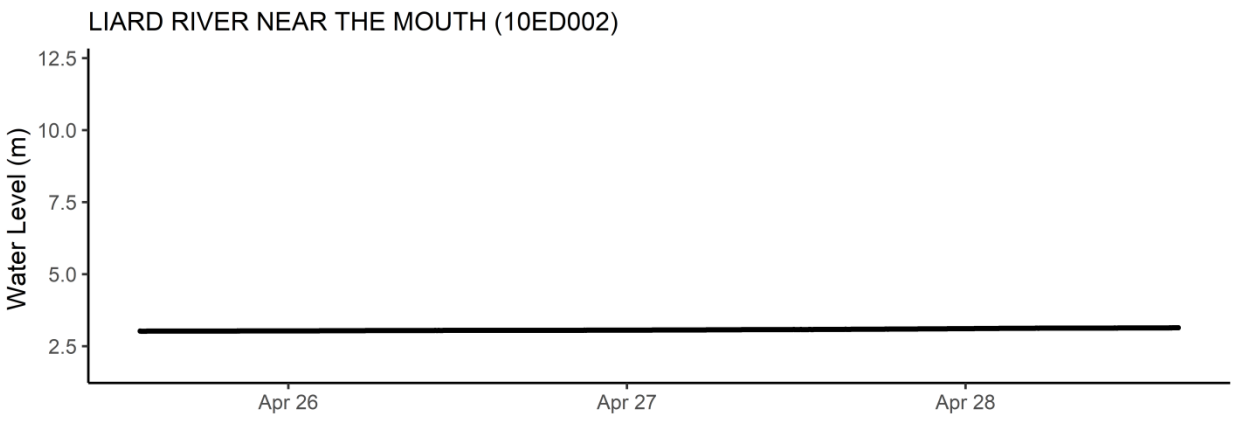


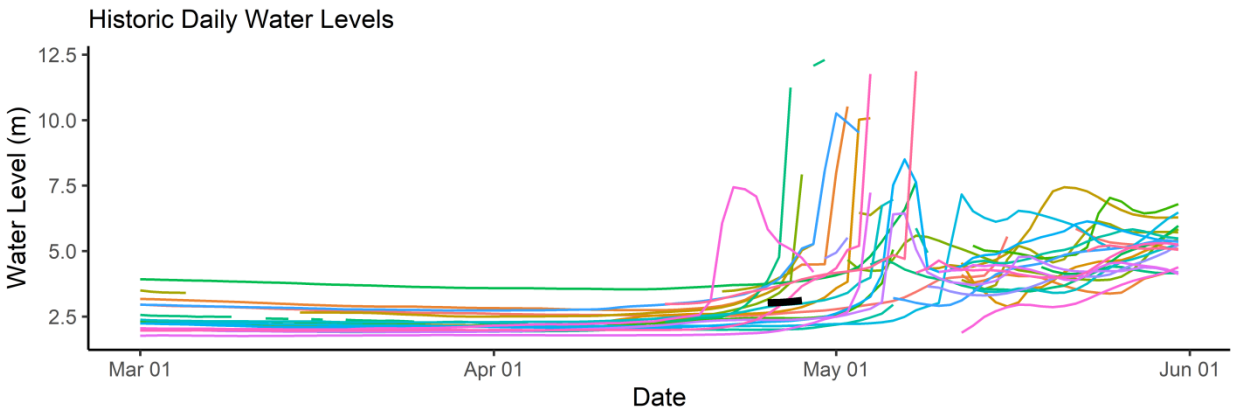


Liard River at Fort Liard hydrometric gauge photo, April 28th. Photo courtesy of Water Survey of Canada and GNWT.

Liard River near the mouth:





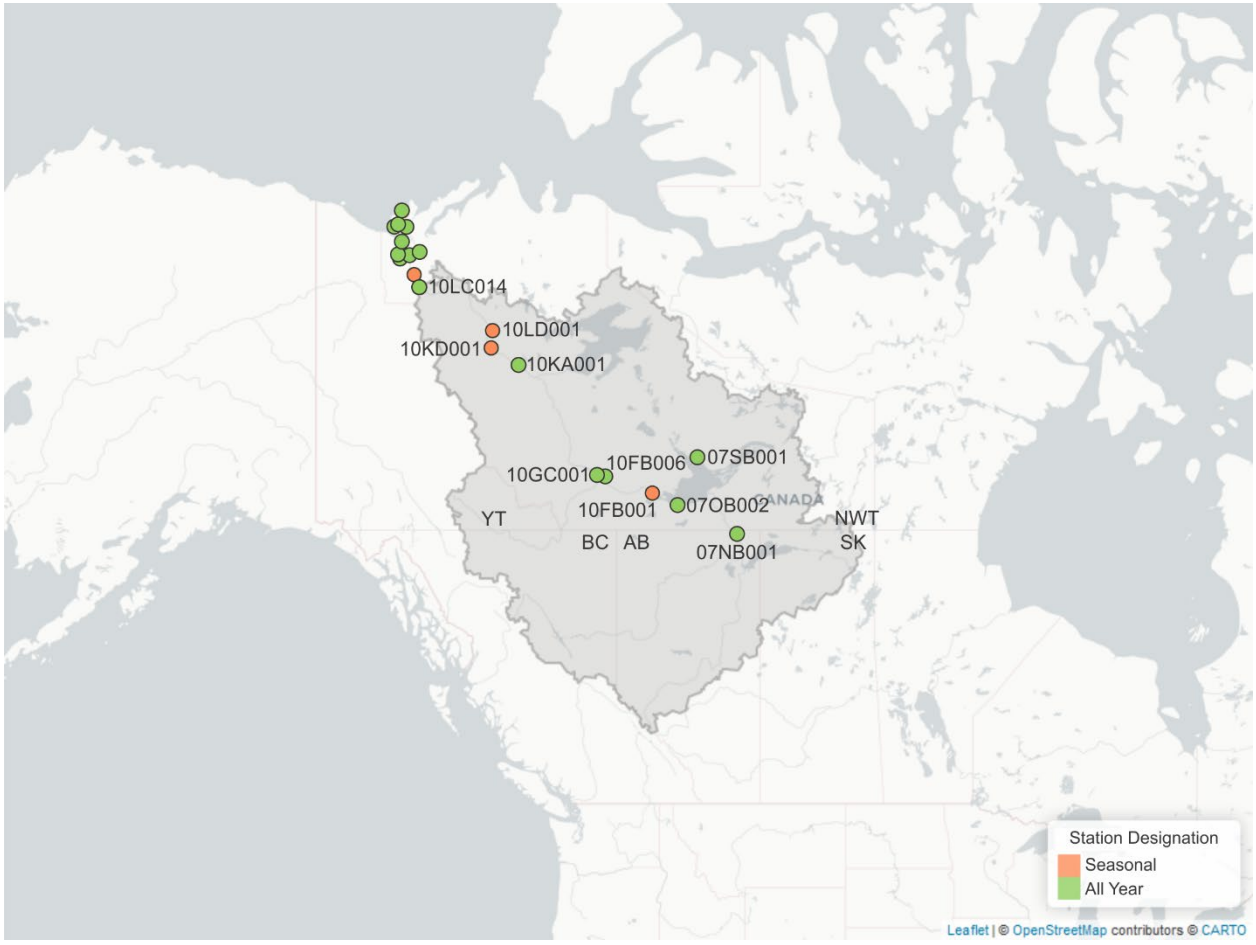


Liard River at Fort Liard hydrometric gauge photo, April 28th. Photo courtesy of Water Survey of Canada and GNWT.

Slave River / Great Slave Lake / Dehcho (Mackenzie River)

Current Status:

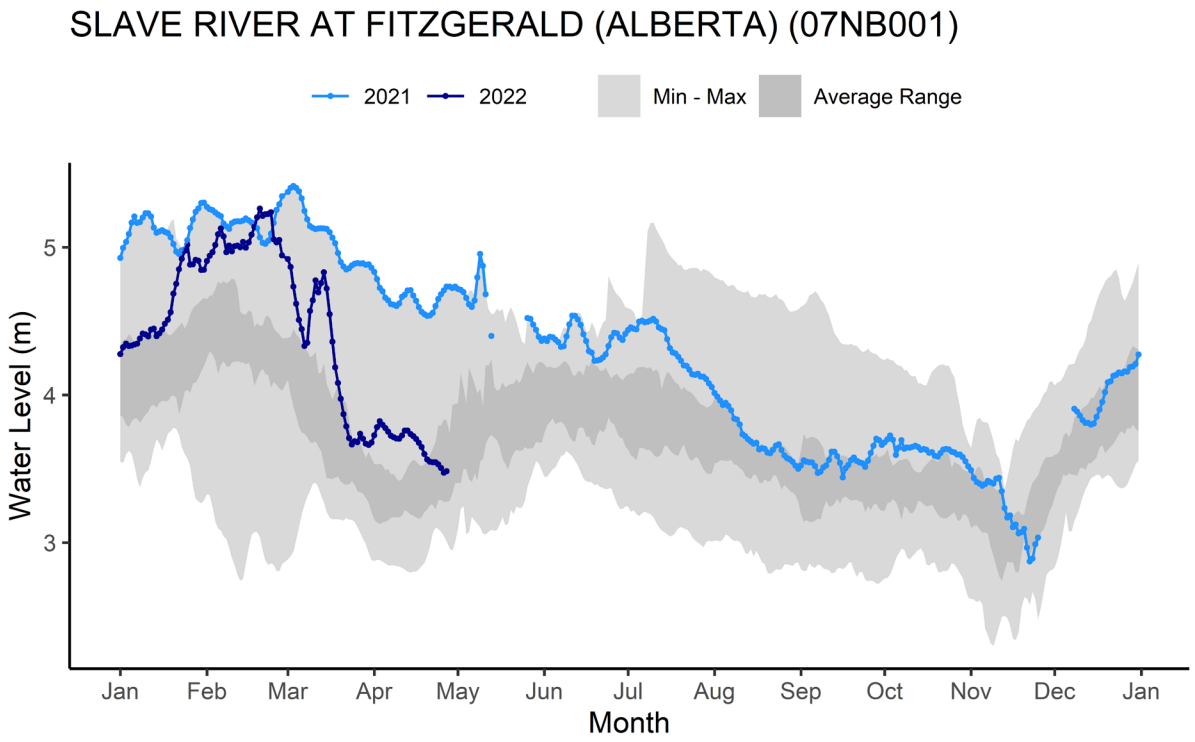
- Break up is well underway in the Peace/Athabasca basins, which drain into the Slave River;
- Break up has not yet commenced on the Dehcho.



Map of hydrometric stations in the Dehcho (Mackenzie River) basin. The station numbers are referenced in the water level plots below.

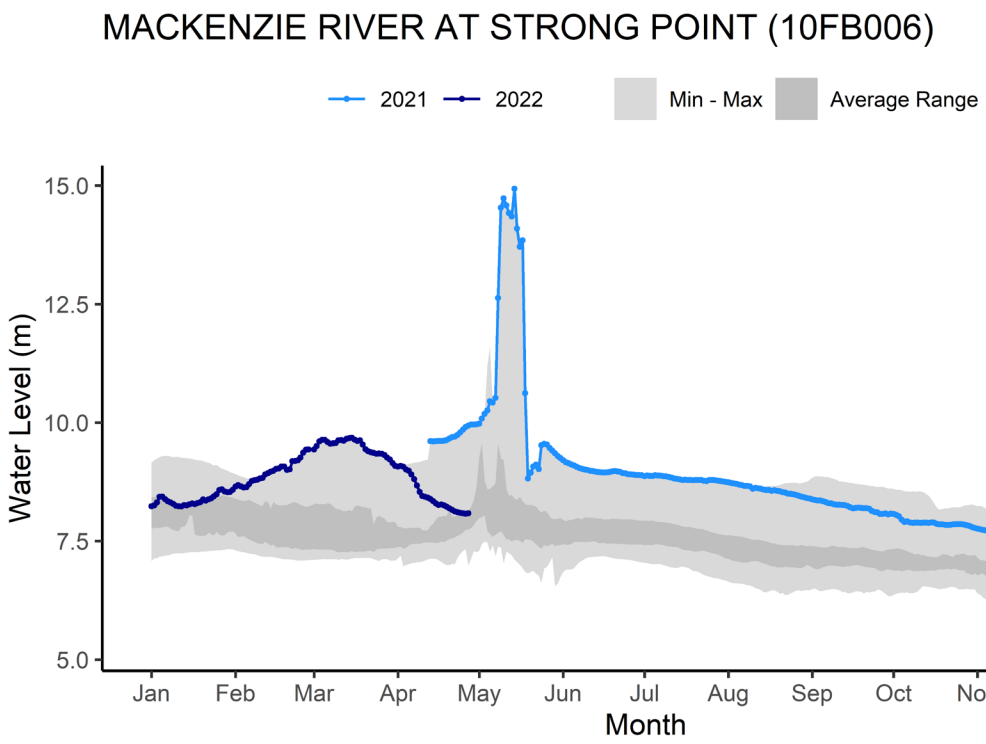
Hydrometric Data:

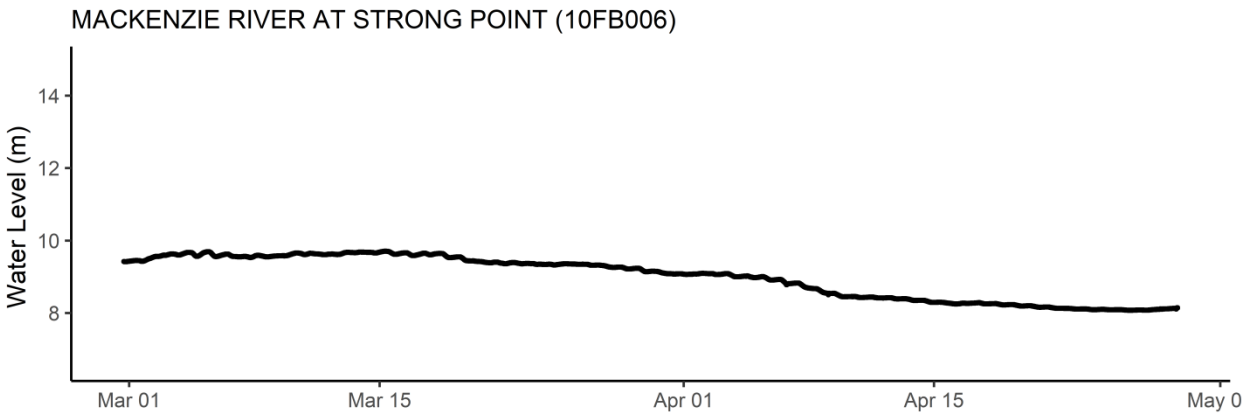
Slave River (Alberta):

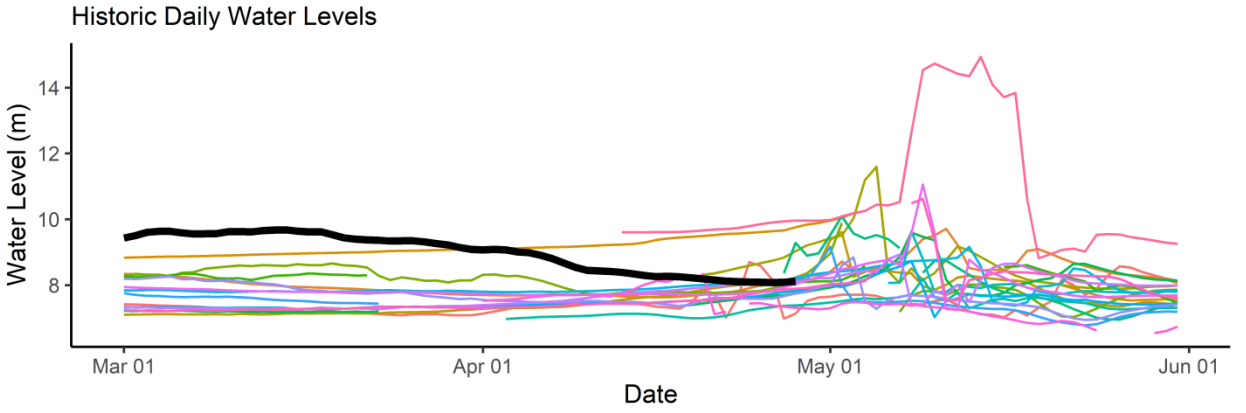


Slave River at Fitzgerald hydrometric gauge photo, April 28th. Photo courtesy of Water Survey of Canada and GNWT.

Mackenzie River at Strong Point:

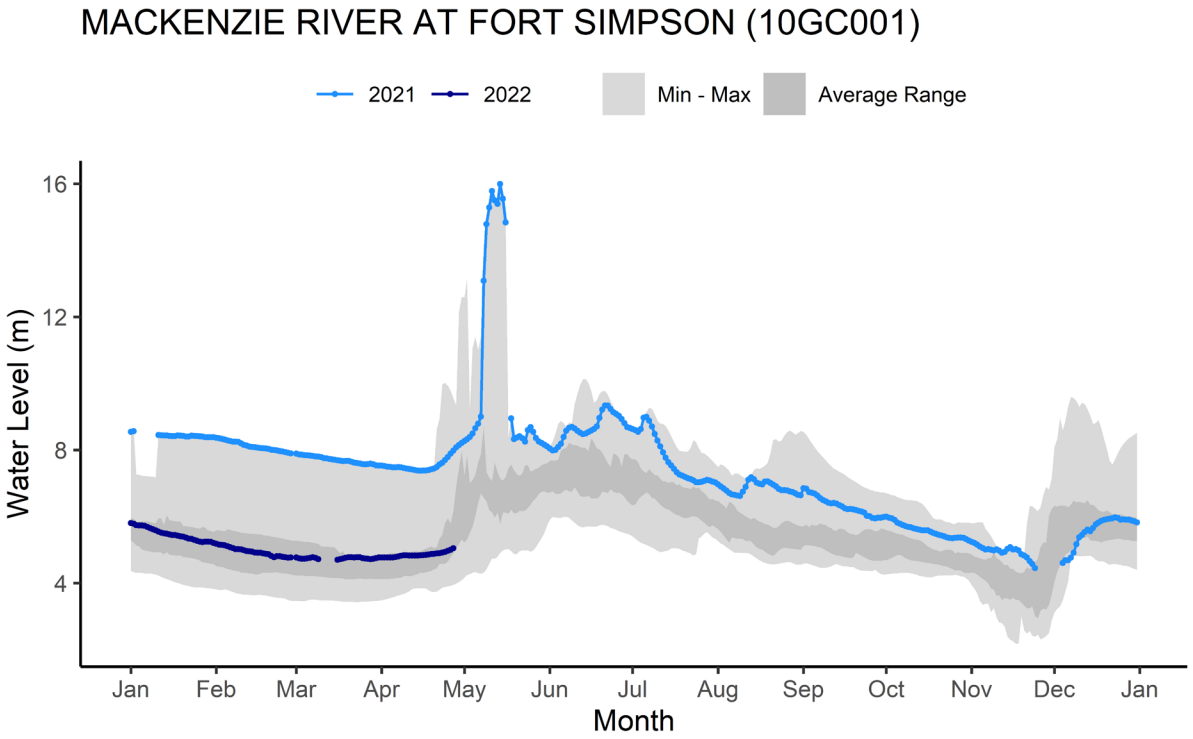


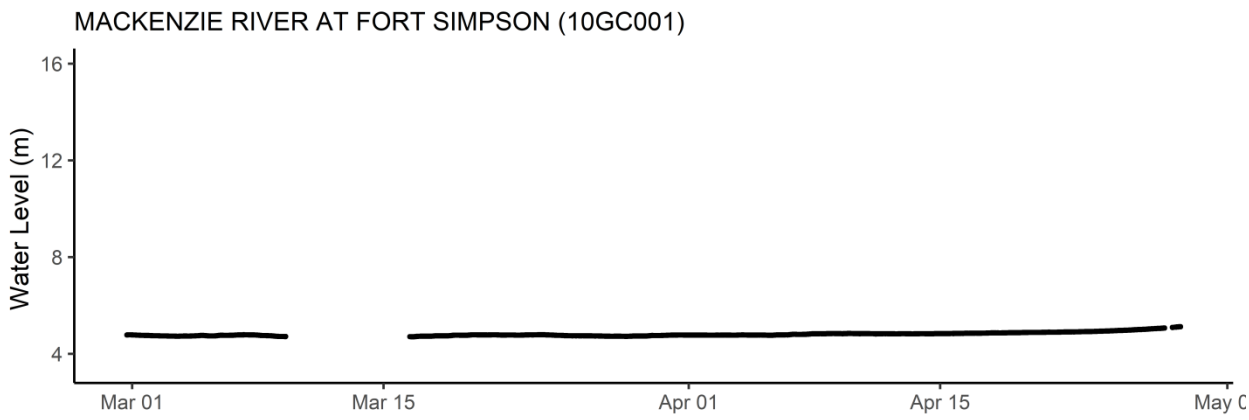


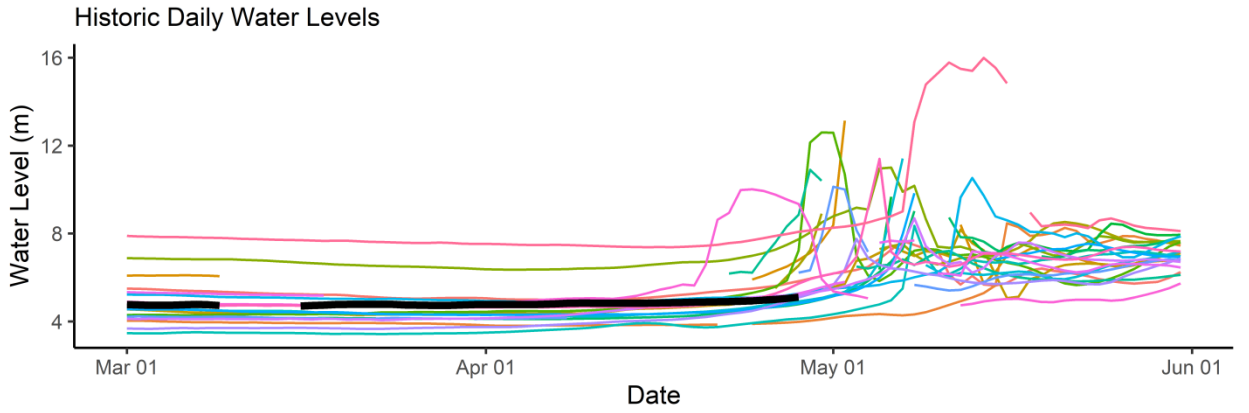


Mackenzie River at Strong Point hydrometric gauge photo, April 28th. Photo courtesy of Water Survey of Canada and GNWT.

Mackenzie River at Fort Simpson:



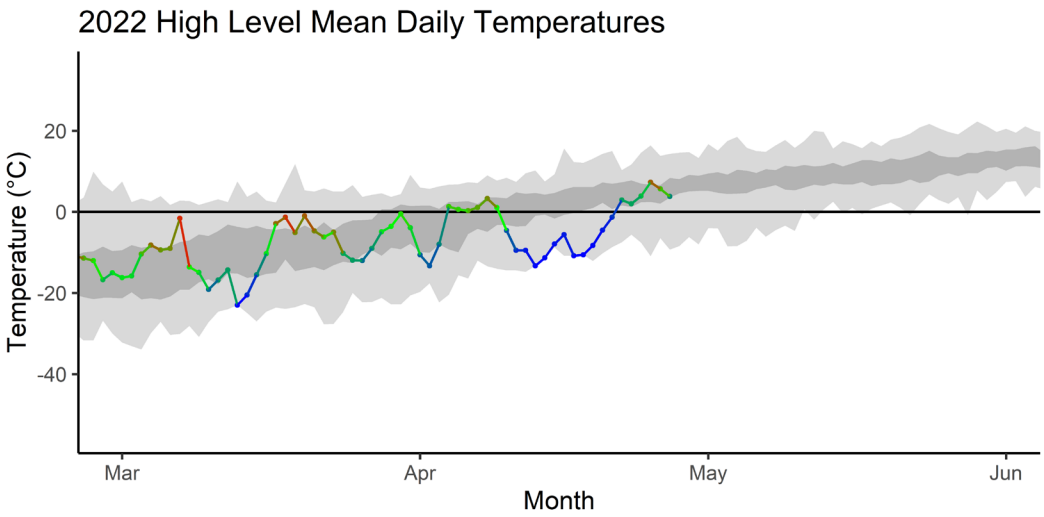


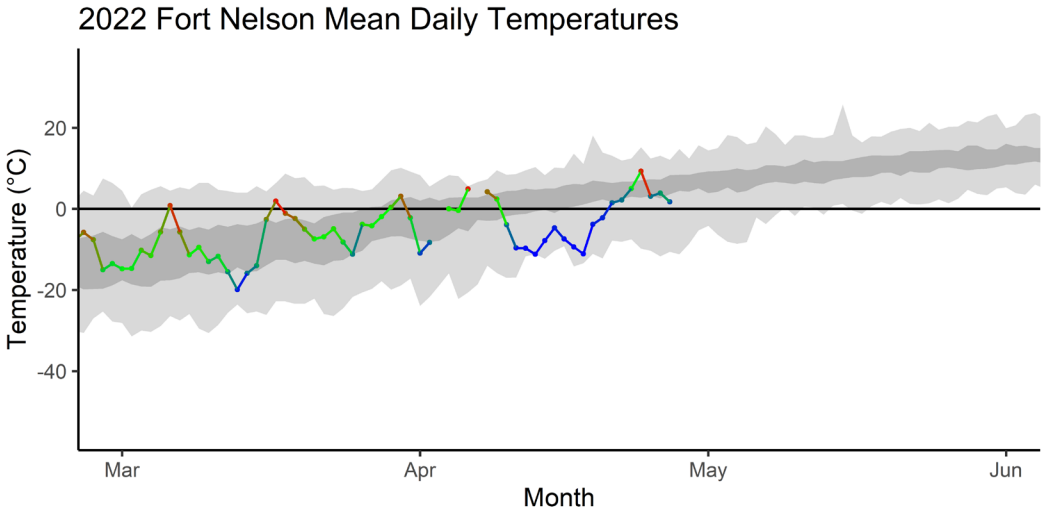


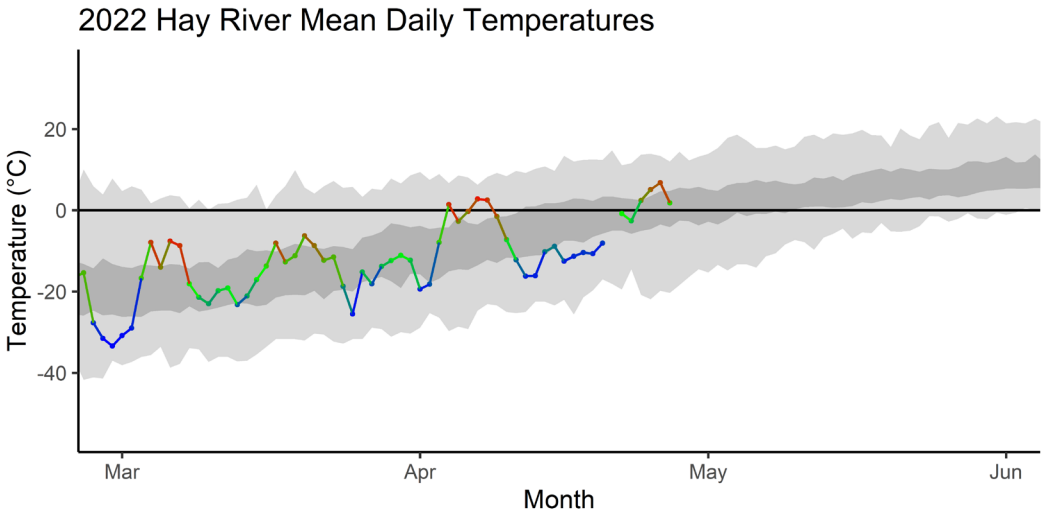
Mackenzie River at Fort Simpson hydrometric gauge photo, April 28th. Photo courtesy of Water Survey of Canada and GNWT.

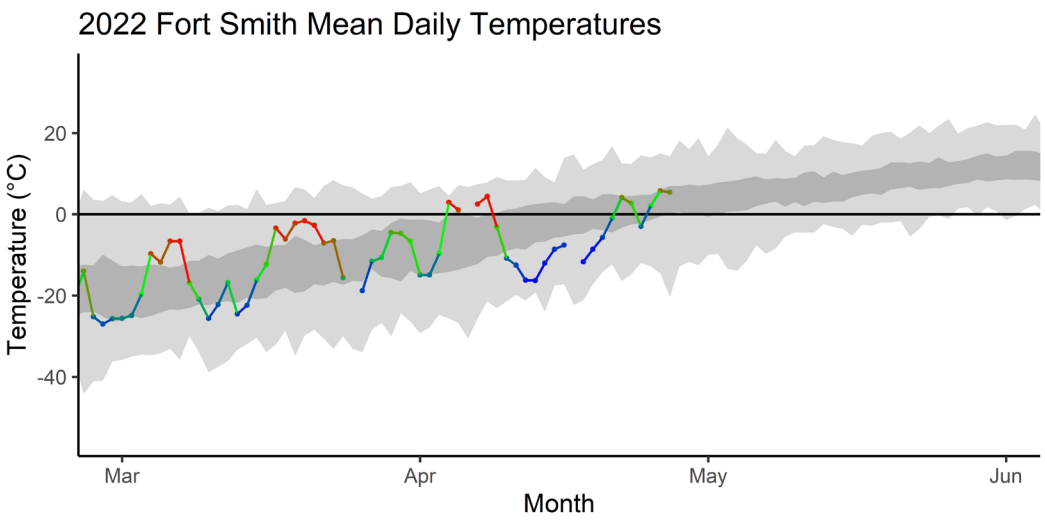
Weather Data:

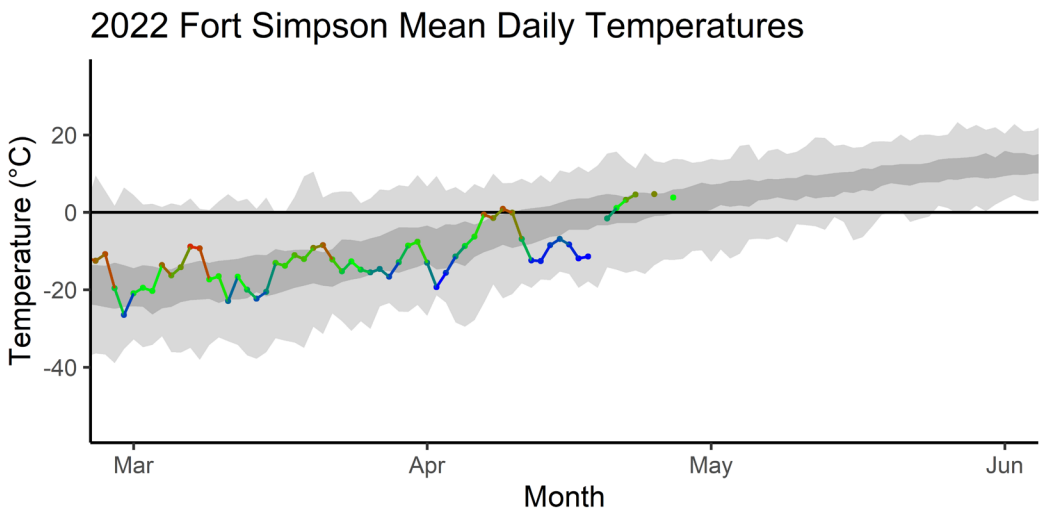
Weather information informs how snow and ice will melt and provides information about how this spring is unfolding relative to previous springs. Locations included here are located in areas that feed into NWT rivers that are currently undergoing break up. Red indicates warmer than average, green is within the average range, while blue indicates colder than average.


2022 High Level Mean Daily Temperatures
Temperature (°C)
20
0
-20
-40
Mar
Apr
May
Jun
Month


2022 Fort Nelson Mean Daily Temperatures
Temperature (°C)
20
0
-20
-40
Mar
Apr
May
Jun
Month


2022 Hay River Mean Daily Temperatures
Temperature (°C)
20
0
-20
-40
Mar
Apr
May
Jun
Month





High Level seven-day weather forecast:

	Fri 29 Apr	Sat 30 Apr	Sun 1 May	Mon 2 May	Tue 3 May	Wed 4 May
	8°C Clearing	8°C Sunny	10°C Sunny	12°C Sunny	16°C A mix of sun and cloud	19°C A mix of sun and cloud
Tonight	**Night**	**Night**	**Night**	**Night**	**Night**	
-2°C Partly cloudy	-2°C Partly cloudy	-5°C Clear	-1°C Clear	2°C Cloudy periods	2°C Cloudy periods	

Fort Nelson seven-day weather forecast:

Thu 28 Apr	Fri 29 Apr	Sat 30 Apr	Sun 1 May	Mon 2 May	Tue 3 May	Wed 4 May
2°C Snow mixed with rain	5°C 40% Chance of rain showers or wet flurries	9°C A mix of sun and cloud	11°C A mix of sun and cloud	11°C Rain	15°C A mix of sun and cloud	14°C Cloudy
Tonight	**Night**	**Night**	**Night**	**Night**	**Night**	
-2°C Snow mixed with rain	-5°C 40% Chance of rain showers or flurries	-1°C Cloudy periods	2°C Cloudy	2°C 60% Chance of showers	3°C Cloudy periods	

Hay River seven-day weather forecast:

Thu 28 Apr	Fri 29 Apr	Sat 30 Apr	Sun 1 May	Mon 2 May	Tue 3 May	Wed 4 May
3°C	-1°C	5°C	11°C	13°C	14°C	14°C
A mix of sun and cloud	Clearing	Sunny	Sunny	Sunny	Sunny	A mix of sun and cloud
Tonight	Night	Night	Night	Night	Night	
-5°C	-9°C	-3°C	2°C	1°C	3°C	
Mainly cloudy	Clear	Clear	Clear	Clear	Cloudy periods	

Fort Smith seven-day weather forecast:

	Fri 29 Apr	Sat 30 Apr	Sun 1 May	Mon 2 May	Tue 3 May	Wed 4 May
	4°C	5°C	6°C	7°C	12°C	17°C
	Clearing	Sunny	Sunny	Sunny	A mix of sun and cloud	A mix of sun and cloud
Tonight	Night	Night	Night	Night	Night	
-5°C	-9°C	-8°C	-5°C	0°C	3°C	
Partly cloudy	Clear	Clear	Clear	Clear	Cloudy periods	

Fort Simpson seven-day weather forecast:

	Fri 29 Apr	Sat 30 Apr	Sun 1 May	Mon 2 May	Tue 3 May	Wed 4 May
	8°C	10°C	13°C	14°C	14°C	17°C
	A mix of sun and cloud	Sunny	Sunny	A mix of sun and cloud	A mix of sun and cloud	A mix of sun and cloud
Tonight	Night	Night	Night	Night	Night	
-6°C	-3°C	0°C	3°C	2°C	4°C	
Partly cloudy	Clear	Clear	Clear	Cloudy periods	Cloudy periods	

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 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 run into 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.