2022 Manitoba Basins Fall Conditions Report

Prepared by:

Hydrologic Forecast Centre

Date:

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EXECUTIVE SUMMARY

The Fall Conditions Report describes the hydrologic conditions of Manitoba basins at the time of freeze-up. Hydrologic conditions at the time of freeze-up and weather conditions in winter and spring are the main factors that affect the extent of the spring runoff potential. This Fall Conditions Report describes the current state of two hydrologic factors for which data is available at the time of reporting. These two known factors covered in this report are the soil moisture at the time of freeze-up and base flows in rivers and water levels on lakes prior to freeze-up. The report also contains the long term forecasted winter precipitation as a general indication of probable future weather and forecasted flows and levels throughout the winter for various rivers and lakes.

Summer and Fall Precipitations

Even though most southern and central Manitoba basins received record to near record precipitation throughout this past winter and spring creating significant flooding, hydrologic conditions improved for the remainder of summer and fall. Precipitation through summer and fall is the main factor that determines the amount of soil moisture at the time of freeze-up and base flows and levels in the winter. Most river basins in Manitoba received normal to below normal precipitation between May and October, with the exception of some areas in central Manitoba, including the Interlake region, and northeast Manitoba, which have received above normal precipitation during this time.

October and November Precipitation

Precipitation in October and November was normal to well above normal in central and northern Manitoba. Southern, western and eastern Manitoba basins generally received below normal precipitation in October and November. Precipitation amounts diminished gradually towards the southern basins with most of the U.S. portion of the Red River basin receiving well below normal precipitation during this time.

Soil Moisture at Freeze-up

Soil moisture at the time of freeze-up is one of the major factors that affects spring runoff potential and flood risk. Due to normal to below normal precipitation between May and October, soil moisture in most Manitoba basins is near normal to below normal, with the exception of some

localized areas in central Manitoba and the Interlake region that have above normal soil moisture. Soil moisture in most parts of the Red River and Souris River basins in the U.S. is below normal. Normal to below normal soil moisture indicates a potential for normal to below normal spring runoff within these river basins, however, the extent of spring runoff is still largely dependent on future weather conditions, including the amount of winter and spring precipitation, as well as snow melt conditions.

River Flows and Lake Levels

Another factor that affects the spring runoff potential is the amount of water currently in the system, as represented by base flows in rivers and the water levels on lakes prior to freeze-up. Base flow is a portion of the stream flow that is not from surface runoff; it is water from the ground, flowing into the river channel over a period of time. Water levels on lakes indicate how much capacity the lakes have to receive spring runoff. Higher base flows and water levels indicate a higher risk of spring flooding, as there is more water already in the system before spring runoff occurs. Base flows and levels on most rivers are normal to well above normal for this time of the year.

Lake Manitoba is within its operating range of 810.5 to 812.5 ft and is expected to remain within this range for the duration of the winter. Lake Winnipeg is within its operating range of 711.0 to 715.0 ft but it is tracking near the upper quartile of historic record for this time of the year. Lake Winnipegosis and Lake St. Martin are near normal to slightly above normal for this time of year. Dauphin Lake is above its operating range of 853.0 to 854.8 ft and tracking near the upper decile level for this time of year. Inflow into Lake of the Prairies (Shellmouth Reservoir) is tracking near normal conditions for this time of the year. The Shellmouth dam is being operated in consultation with the Shellmouth Reservoir Regulation Liaison Committee (SLC) to drawdown the reservoir to create sufficient storage for spring runoff.

Long-term Precipitation Outlook

Winter precipitation is another factor that affects spring runoff potential. Although long-term weather forecasts are not very reliable, they provide an indication of potential future snowfall amounts. Environment and Climate Change Canada’s latest long-term precipitation forecast for December to February indicates a potential for above normal precipitation in northern Manitoba and northern Saskatchewan and a potential for near normal precipitation for southern Manitoba

and southern Saskatchewan. The National Weather Service (NWS) Climate Prediction Center's outlook indicates above normal precipitation within the U.S. portion of the Red River and the Souris River basins from December to March. Global weather models predict the continuation of a La Nina weather condition in the winter and spring. Generally, with the La Nina weather conditions, the long term precipitation forecast favours near normal to below normal precipitation for most central and southern Manitoba basins.

Forecasted Winter Flows and Levels

The Fall Conditions Report also contains forecasted flows and levels on major rivers and lakes for near normal winter weather conditions prior to the spring runoff. The Assiniboine River is forecasted to maintain near normal flows until the spring runoff. Flows and levels on the Assiniboine River are affected partly by the sustained release of outflows from the Shellmouth Reservoir, which is being drawn down to provide room for spring runoff. The Red River is expected to maintain near normal flows and levels within the Red River valley in the period prior to the spring runoff. Flows on the Waterhen, Fairford and Dauphin Rivers will remain near normal to slightly above normal throughout the winter. Lake Manitoba is expected to remain near or slightly below 812 ft and Lake Winnipegosis will remain near the current level of 830.9 ft throughout the winter. Lake St Martin is expected to reach just below 801 ft (flood stage) before the spring runoff while Lake Winnipeg is forecasted to be near 714 ft by March 31, 2023.

The Hydrologic Forecast Centre (HFC) of Manitoba Transportation and Infrastructure works in collaboration with Environment and Climate Change Canada, the National Weather Service (NWS), and flood forecasters in neighbouring jurisdictions to regularly monitor the winter precipitation patterns throughout Manitoba basins.

At this point in time, it is not practical or feasible to provide a reliable long-term flood forecast for spring 2023 as conditions could change significantly during the coming months. Basins with normal to above normal soil moisture conditions, base flow, and lake level conditions indicate a higher chance for normal to above normal flows and levels in spring runoff. However, there will be a lower chance of receiving above normal spring runoff if less winter or spring precipitation and a gradual snowmelt occur. Conversely, the risk of spring flooding could increase if heavy winter precipitation occurs, or if a fast snowmelt rate or heavy rainfall were to occur in early spring.

Looking back at some of the most significant historic flood or drought events, each flood or drought event is caused by a combination of multiple unique circumstances. There is an inherent risk of over-estimating or under-estimating the extent of spring runoff if one considers the conditions and available precipitation four months in advance of the spring runoff. The Hydrologic Forecast Centre will continue to monitor watershed conditions closely and will release spring runoff outlooks through the winter as required.

BACKGROUND

The spring runoff potential is generally dependent on six major factors:

- Winter precipitation;
- Soil moisture at freeze-up;
- Effective spring rain (April rainfall);
- Melt rate;
- Depth of frost; and
- Base-flow conditions

All of the above factors combine to determine the magnitude of spring runoff, which could range from a major flood event to an extremely low runoff event. The combination of these factors is generally unique for each specific year and for each specific watershed across the province. Generally, the soil moisture at freeze-up, winter precipitation, and base flow conditions are well known before spring melt and give a strong indication of the runoff potential.

SUMMER AND FALL PRECIPITATION

Most southern and central Manitoba basins received record to near record precipitation throughout the past winter and spring (2022) creating significant flooding, however, hydrologic conditions improved for the remainder of summer and fall. Most Manitoba watersheds received normal to below normal precipitation between May and October, with the exception of some areas in central Manitoba, including the Interlake region, and northeast Manitoba which received above normal precipitation during this time. The highest precipitation amounts were across central Manitoba and the Interlake region as well as northern Manitoba. Most of Saskatchewan received normal to below normal summer and fall precipitation (Figure 1). Most areas in southern, central and northern Manitoba received 0 to 150 mm above normal precipitation between May and October while the U.S. portion of the Red and Souris Rivers, northwestern Manitoba and most of Saskatchewan received 0 to 150 mm less than normal precipitation during this time (Figure 2). Comparing with historic records, precipitation received in southern, central and northern Manitoba watersheds ranks within 40 to 95% range and within 5 to 40% range in the U.S. portion of the Red and Souris rivers and in northwestern Manitoba (Figure 3).

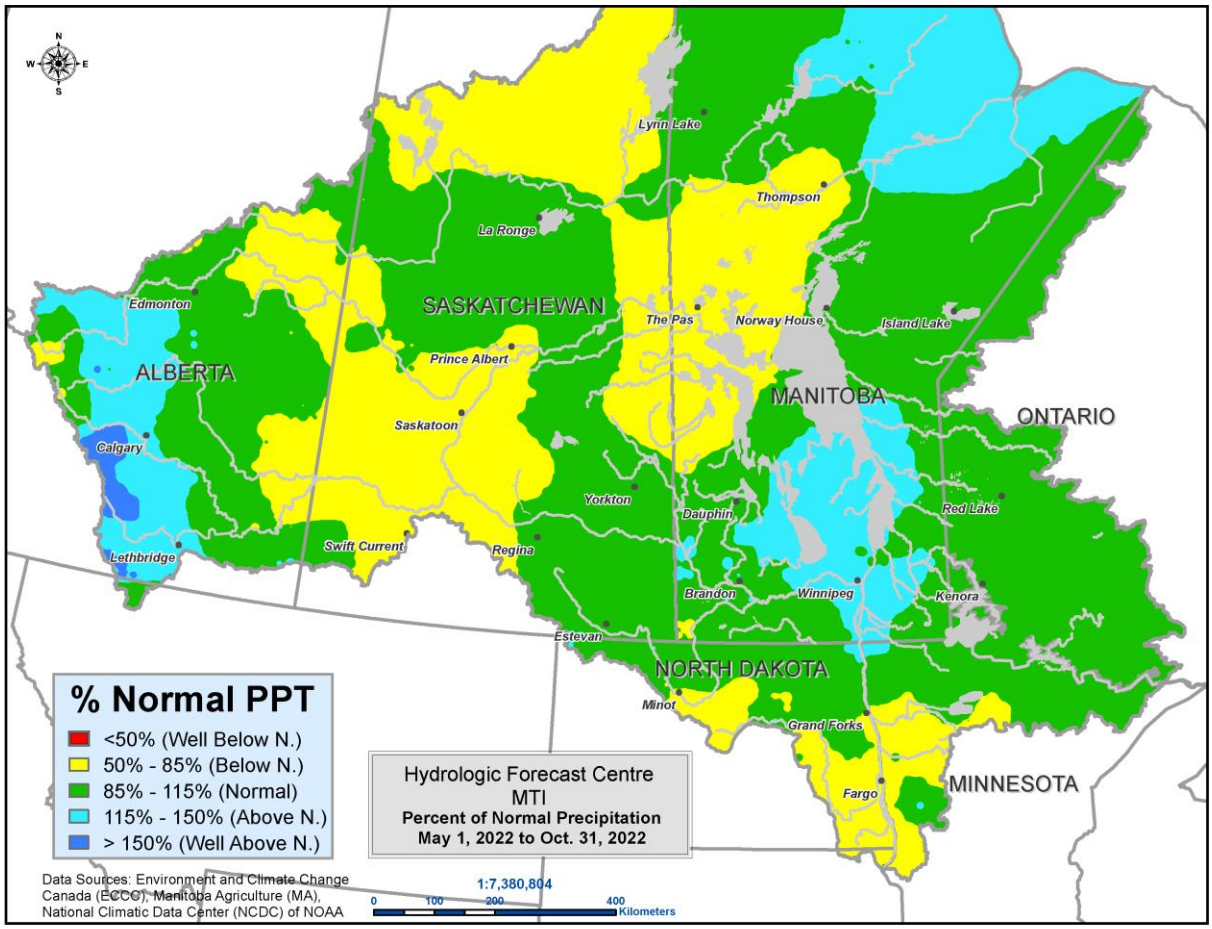

Figure 1. Percent of normal precipitation (%) from May 1 to Oct 31, 2022

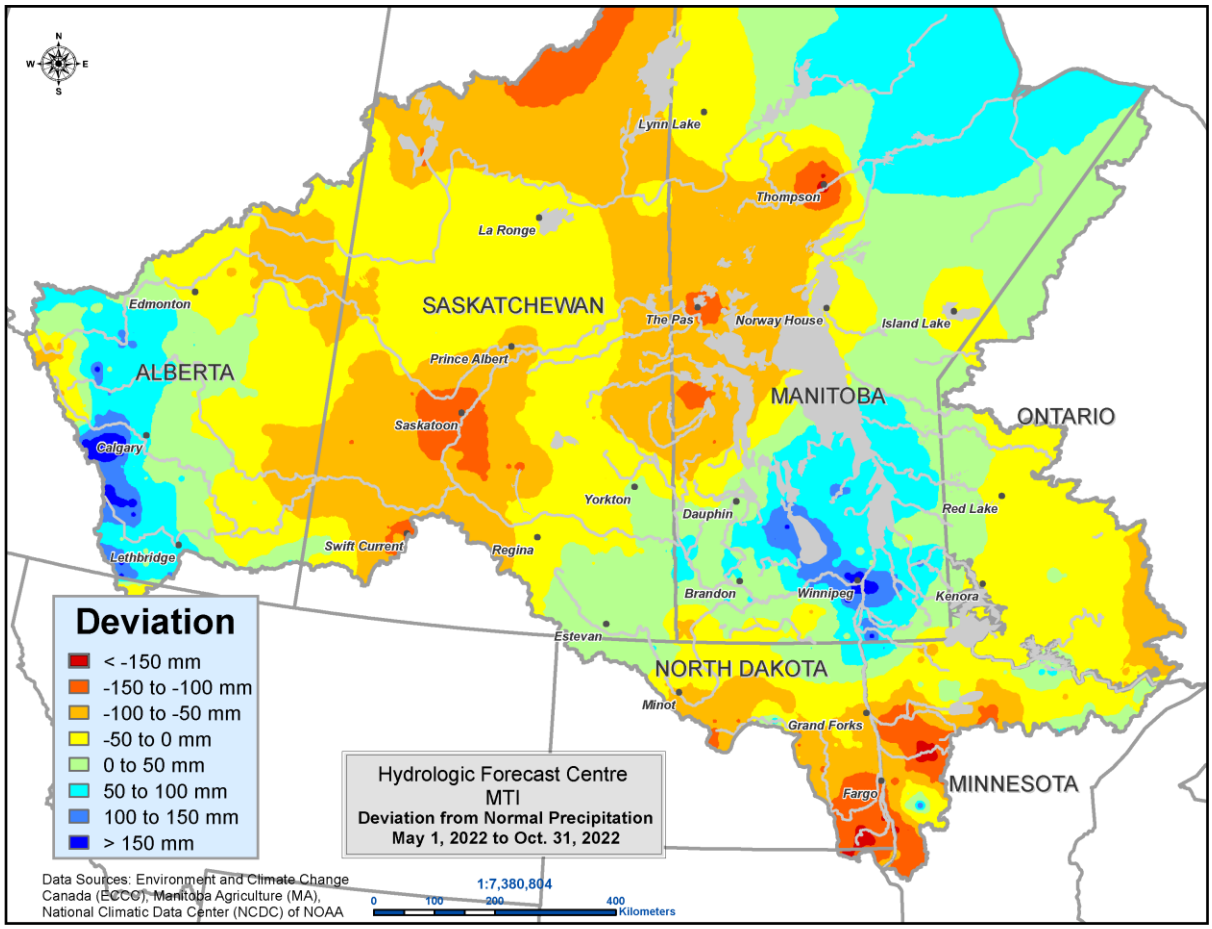

Figure 2. Deviation from normal precipitation (mm) from May 1 to Oct 31, 2022

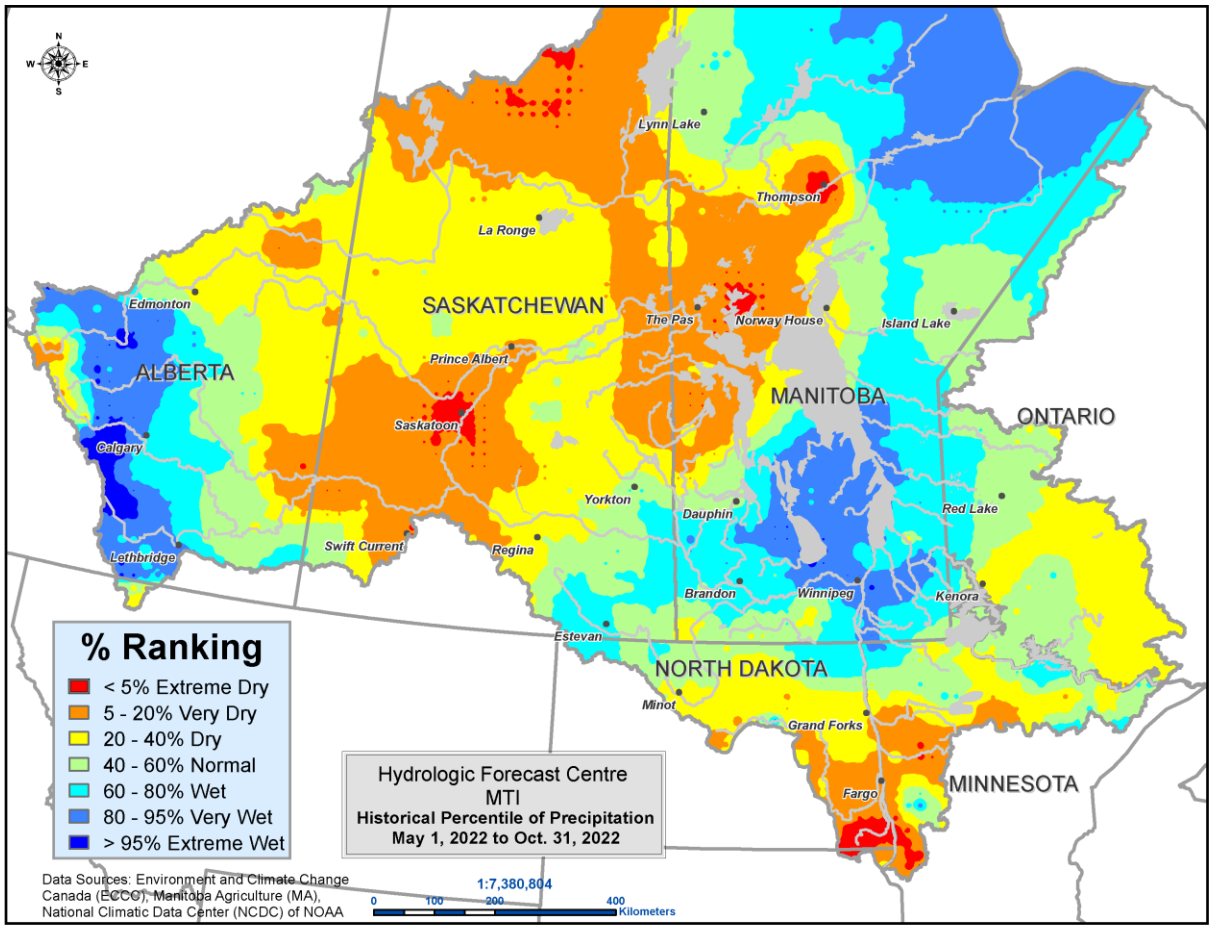

Figure 3. Percent ranking precipitation (%) for May 1 to Oct 31, 2022

OCTOBER AND NOVEMBER PRECIPITATION

October and November (Fall Season) is typically the most critical period that impacts the soil moisture levels at freeze up. Precipitation patterns throughout the fall brought higher precipitation amounts across northern Manitoba watersheds and decreased amounts towards the southern watersheds. Precipitation in October and November is normal to well above normal in parts of central and northern Manitoba watersheds, including parts of the Nelson and Churchill Rivers., Precipitation in October and November is below normal to well below normal for the U.S. portion of the Red and Souris River basins. Southern, western and eastern Manitoba and eastern Saskatchewan basins generally received below normal precipitation in October and November

(Figure 4). During this time, some areas in northern Manitoba received over 30 mm more than normal precipitation, central Manitoba and the Interlake region received close to normal, eastern Saskatchewan and western and southern Manitoba received 10 to 30 mm less than normal precipitation. Most of the U.S. portion of the Red and Souris River basins received 30 to 50 mm less than normal precipitation (Figure 5). When compared with historic records, precipitation received within Manitoba watersheds within the fall season ranks from approximately 5 to 40% in most parts of southern and central Manitoba basins, including the Red and Souris River basins in the U.S., and 60 to 95% in most of northern Manitoba basins (Figure 6).

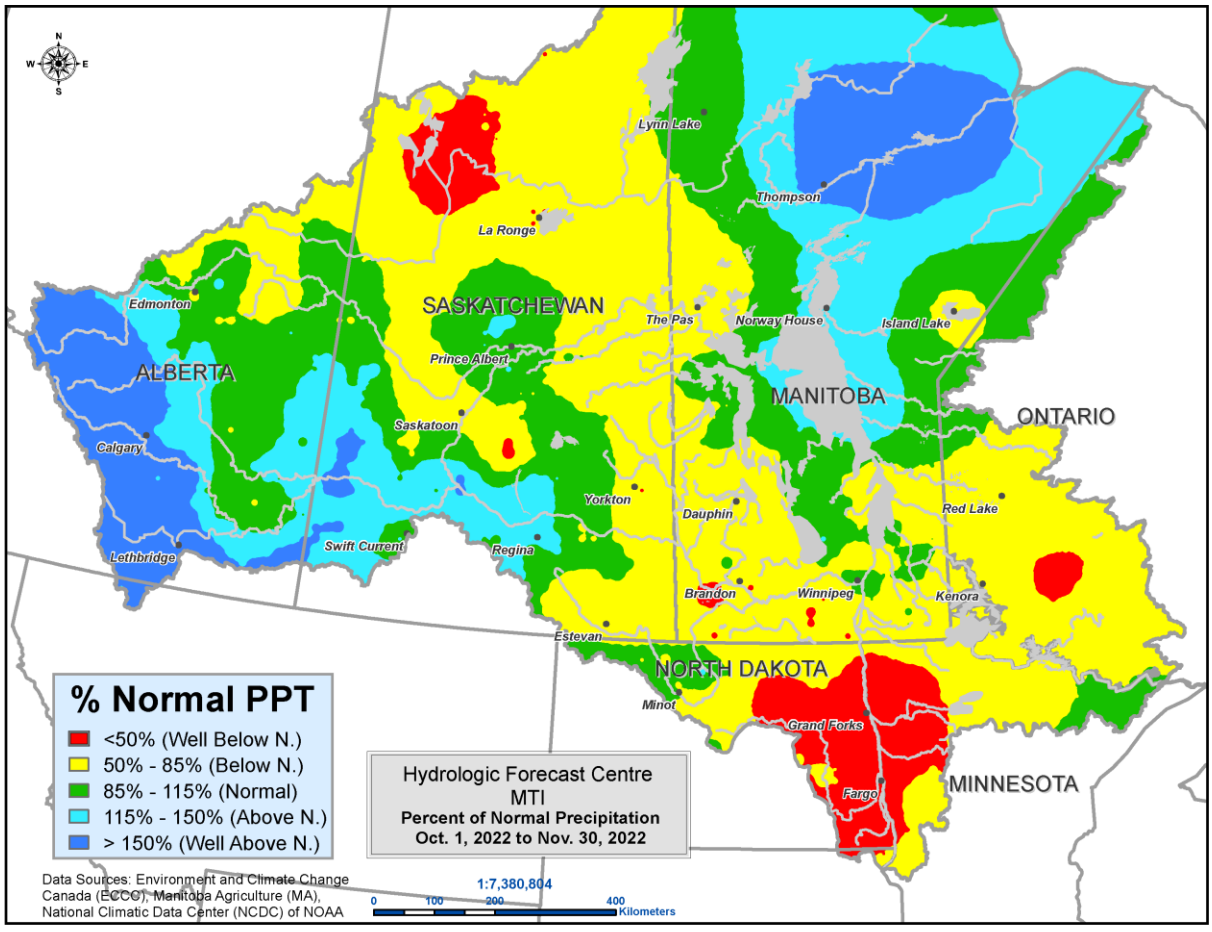

Figure 4. Percent of normal precipitation (%) from Oct 1 to Nov 30, 2022

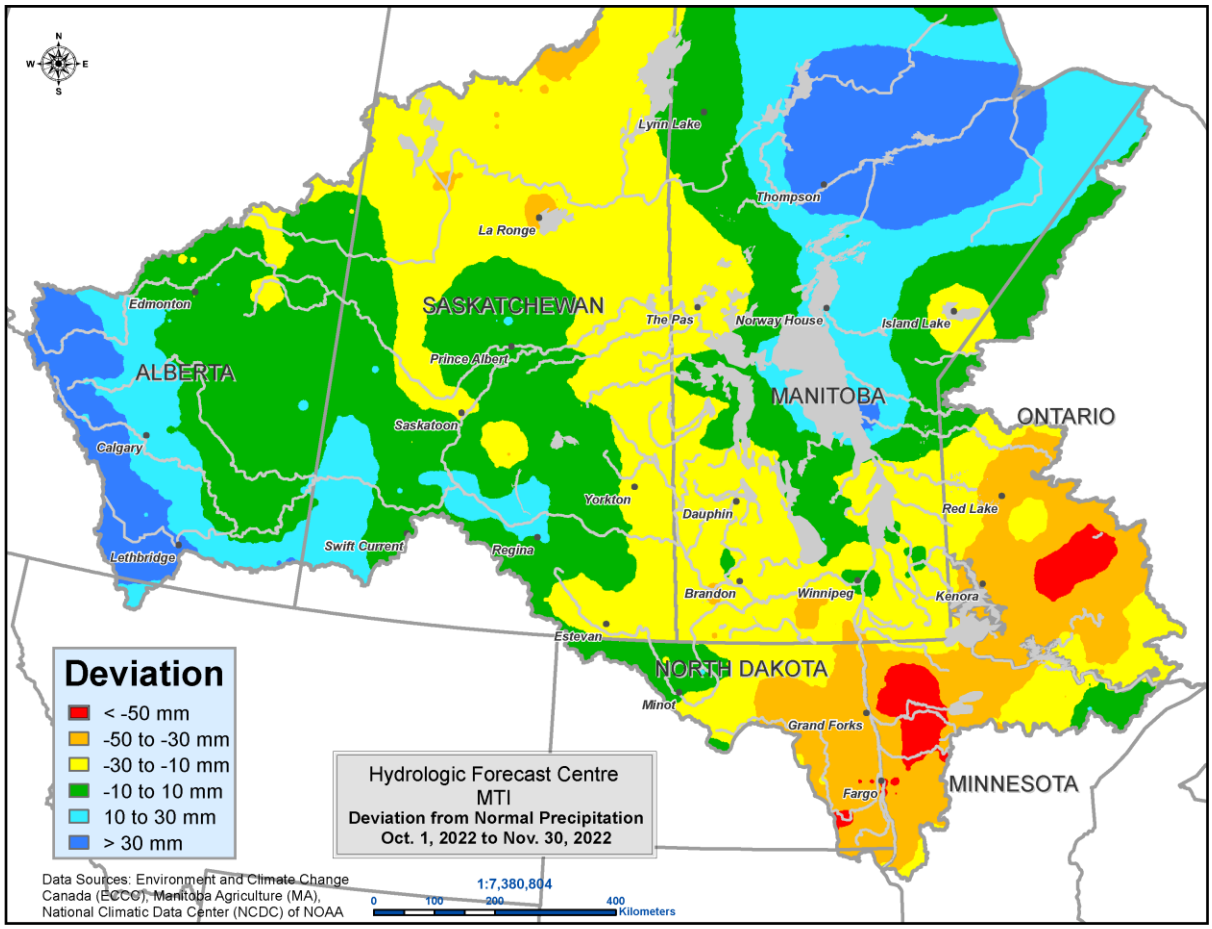

Figure 5. Deviation from normal precipitation (mm) from Oct 1 to Nov 30, 2022

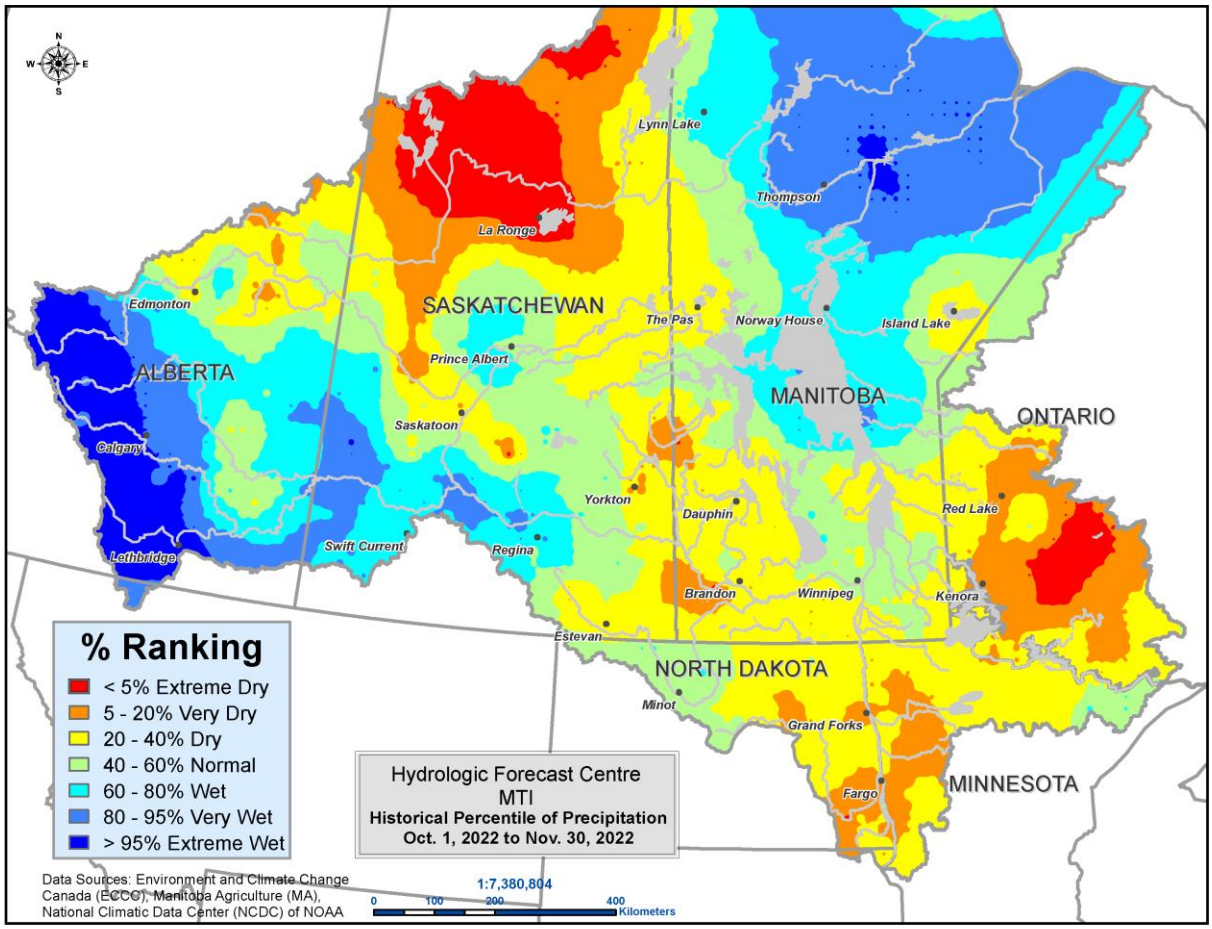

Figure 6. Percent ranking precipitation (%) for Oct 1 to Nov 30, 2022.

SOIL MOISTURE CONDITIONS

A number of different tools have been used to determine the soil moisture at freeze-up. The most common method, which has been used for years, is the Manitoba's MANAPI model, which is expressed by the API (Antecedent Precipitation Index) method. The MANAPI model indicates the degree of saturation in the soil. This method uses the recorded precipitation at a large number of meteorological stations throughout the various basins to calculate the amount of summer and fall rain that remains in the soil layer and has yet to contribute to runoff. Figure 7 shows the API map for the fall of 2022 expressed in percent of normal.

The API model results indicate that soil moisture is near normal to below normal for the majority of Manitoba basins. There are pockets of areas in southern and central Manitoba, including areas near Winnipeg, and the Interlake region that have above normal soil moisture. Western Manitoba and most of the U.S. portions of the Red and Souris River basins have below normal soil moisture (Figure 7). The soil moisture is normal to below normal in the Assiniboine River and Qu'Appelle River basins in Saskatchewan. The Winnipeg River system in Ontario has below normal soil moisture. Eastern Manitoba and Whiteshell Lakes area have near normal soil moistures.

Manitoba Agriculture also collects soil moisture measurements in the top 30 cm of the soil through its automatic weather monitoring stations located at various places across the province. These results, which indicate the moisture condition of the soil, are shown in Figure 8. Soil moisture measurements collected in the top 30 cm through monitoring sensors indicate the soil moisture is optimal to wet throughout most of southern and central Manitoba as of October 30, with localized areas that are considered dry. This system does not include many weather stations in Northern Manitoba to assist with the measurement of soil moisture. The Manitoba Agriculture system differs from the API system in a way that describes the current soil moisture conditions as very wet to very dry in contrast to API map which describes the soil moisture as percent of historic normal.

The National Weather Service (NWS) Climate Prediction Center, through its soil moisture monitoring and modelling works, indicates near normal to below normal soil moisture for the U.S. portion of the Red and Souris River basins (Figure 9).

In summary, soil moisture in most Manitoba watersheds, including watersheds in Ontario, Saskatchewan and the U.S., is near normal to below normal, with the exception of some localized areas in central Manitoba and the Interlake region that have above normal soil moisture.

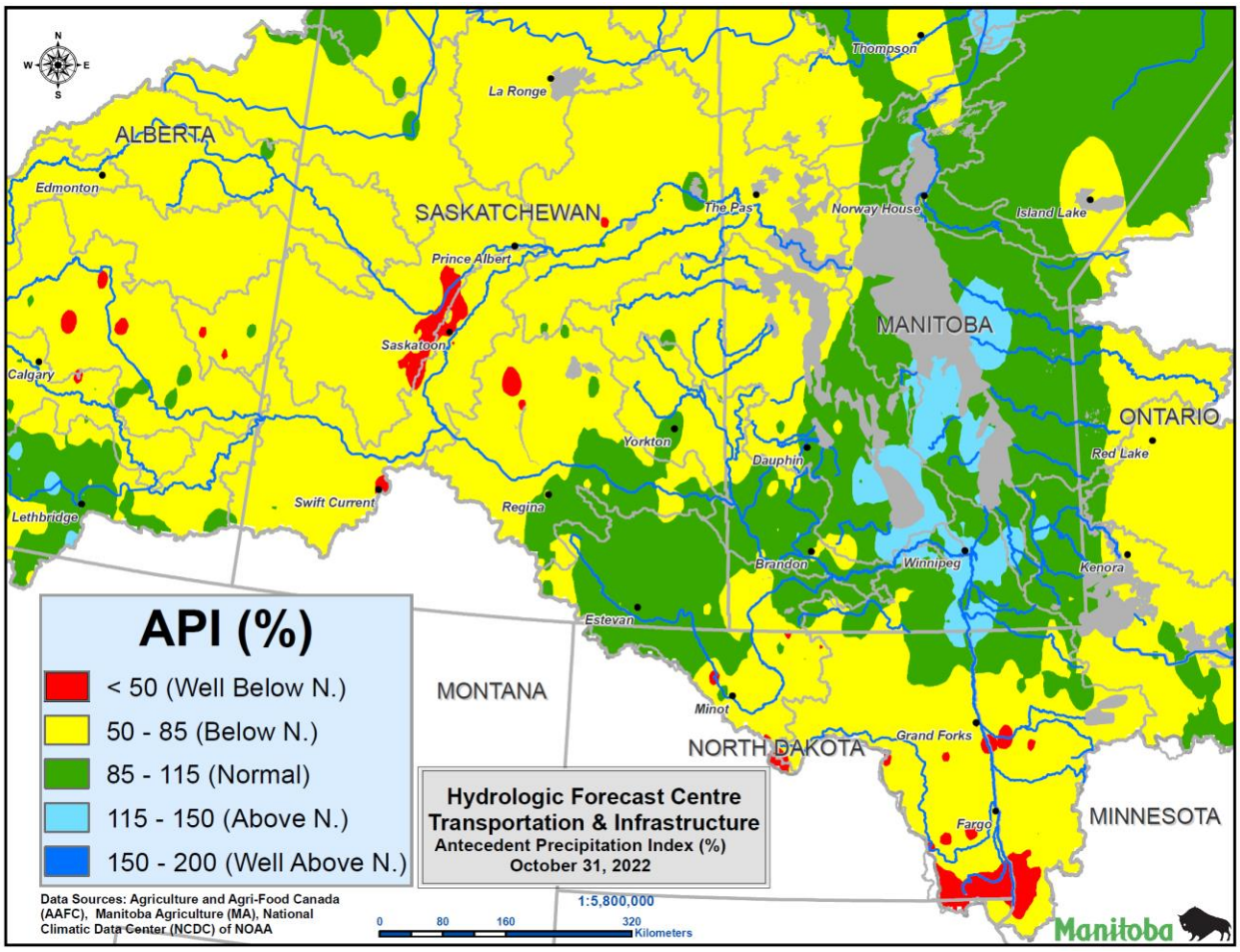

Figure 7. Antecedent Precipitation Index (API) (%) for 2022

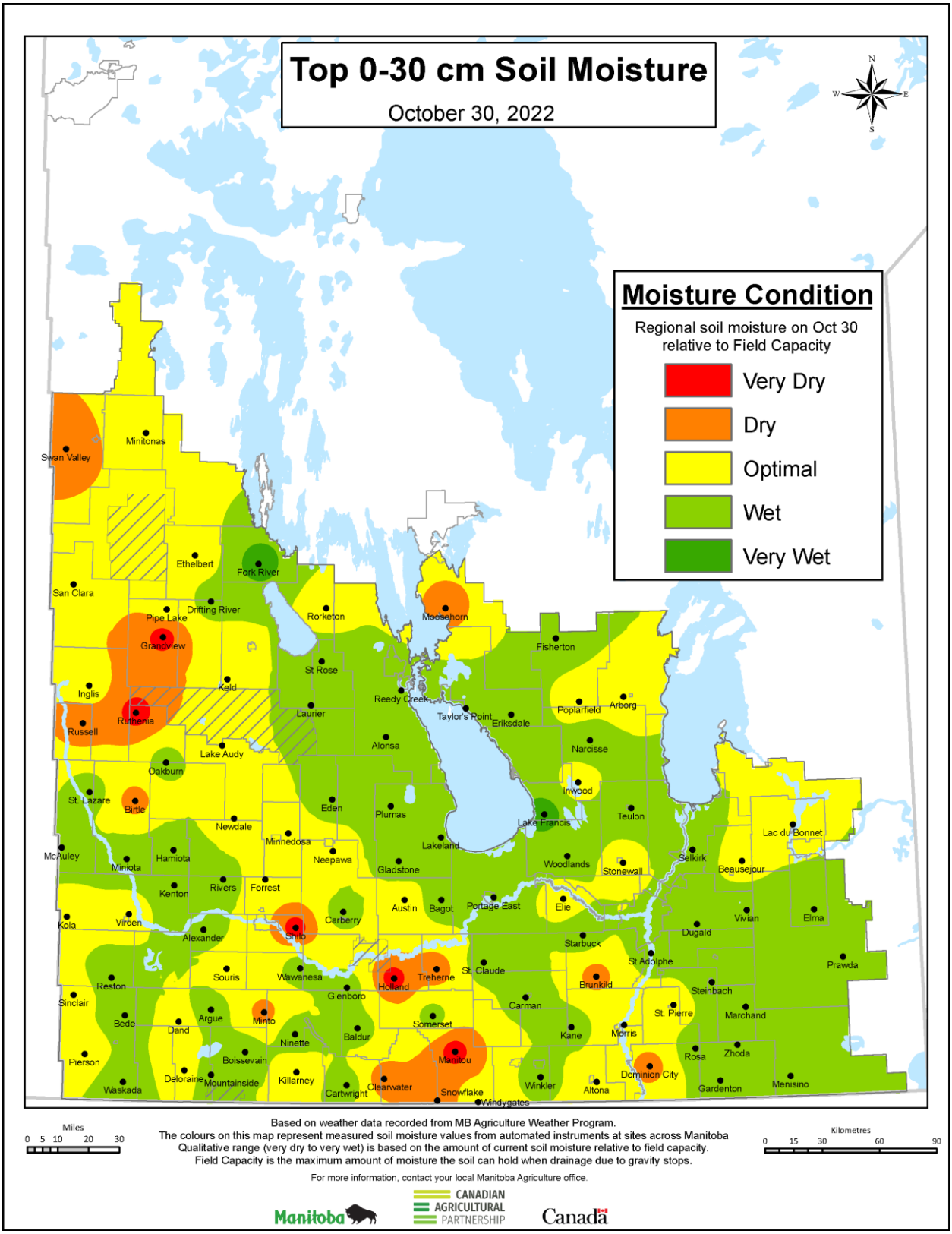

Figure 8. Soil moisture in top zone (0 to 30 cm) based on field measurements as of October 30, 2022

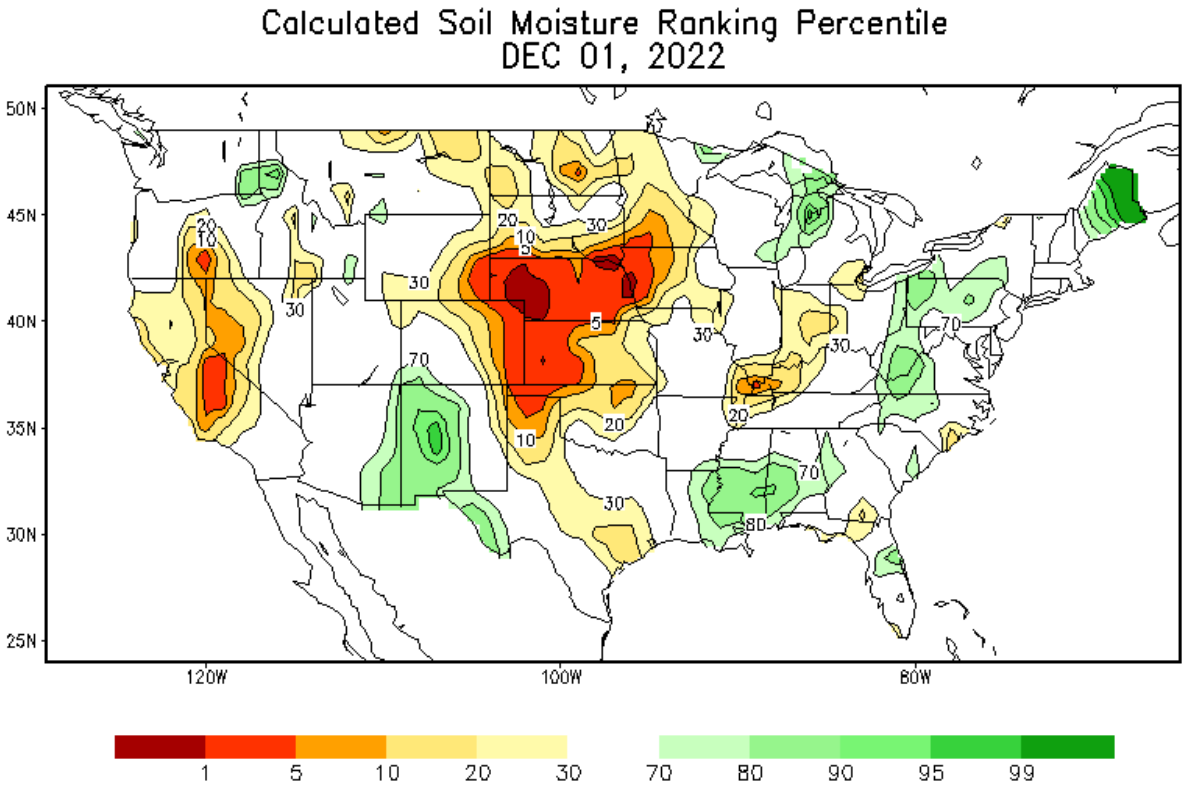

Figure 9. Calculated soil moisture ranking percentile as of December 1, 2022, from the NWS

BASE FLOWS AND LEVELS CONDITIONS

Rivers

Base flow is a portion of the stream flow that is not from surface runoff; it is water from the ground, flowing into the river channel over a period of time. Base flows and levels range from normal to well above normal in Manitoba rivers. Figure 10 shows current base flows in comparison with historic records. Hydrographs showing the measured or estimated flows on major Manitoba rivers as of December 1, 2022 are shown in Figures 11 to 22. In most cases, near normal base flows indicate near normal ground saturations or near normal soil moisture content. Below normal base flows indicate below normal soil saturation level while above normal base flows indicate above normal soil saturation levels. Above normal base flows and levels indicate higher risk of spring

flooding in these rivers. Current flows for main rivers at selected locations are listed in Table 1. (Note: Some flow readings might be affected by ice).

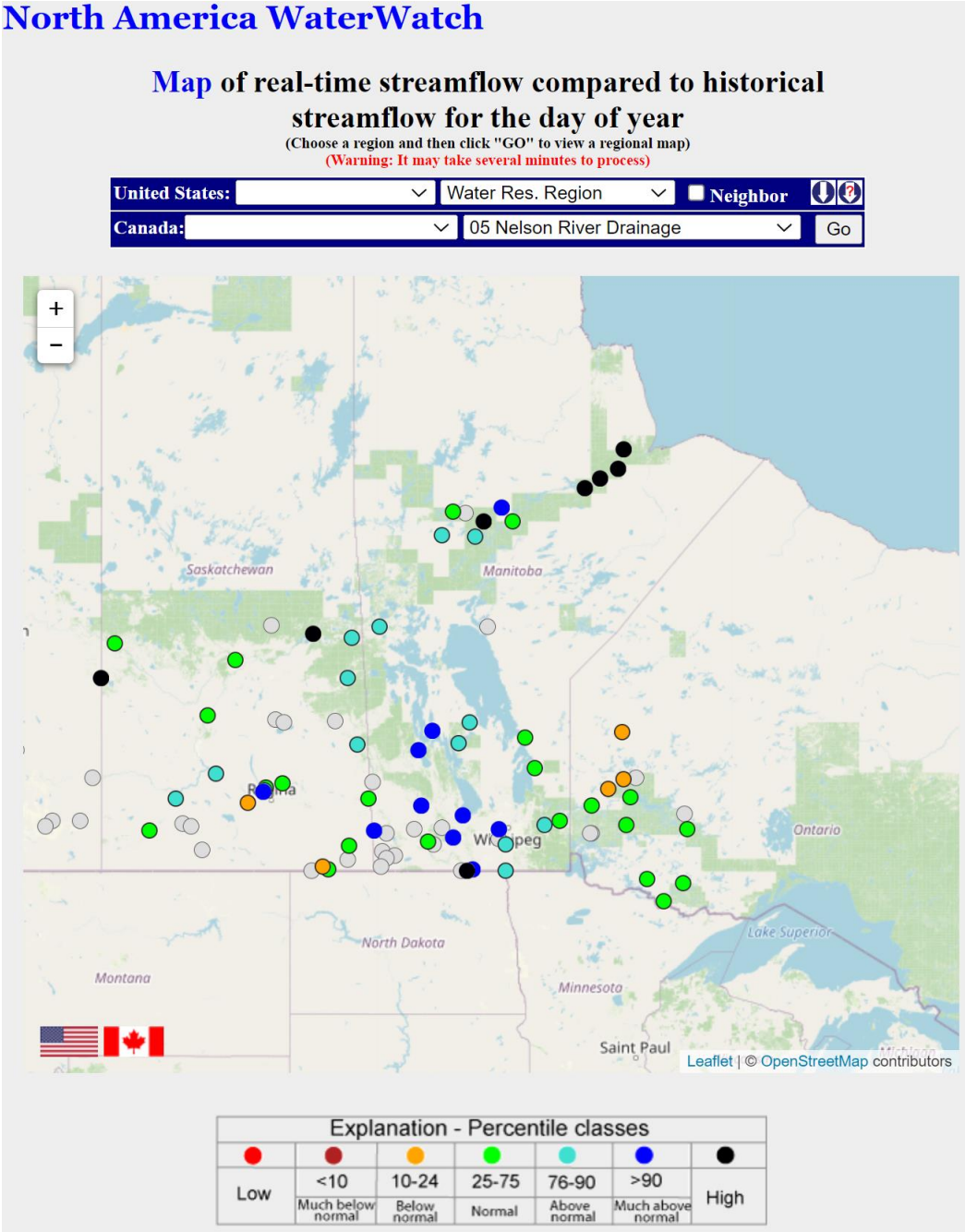

Figure 10. Base flow and level conditions as of December 1, 2022 (readings at some gauges might be affected by ice)

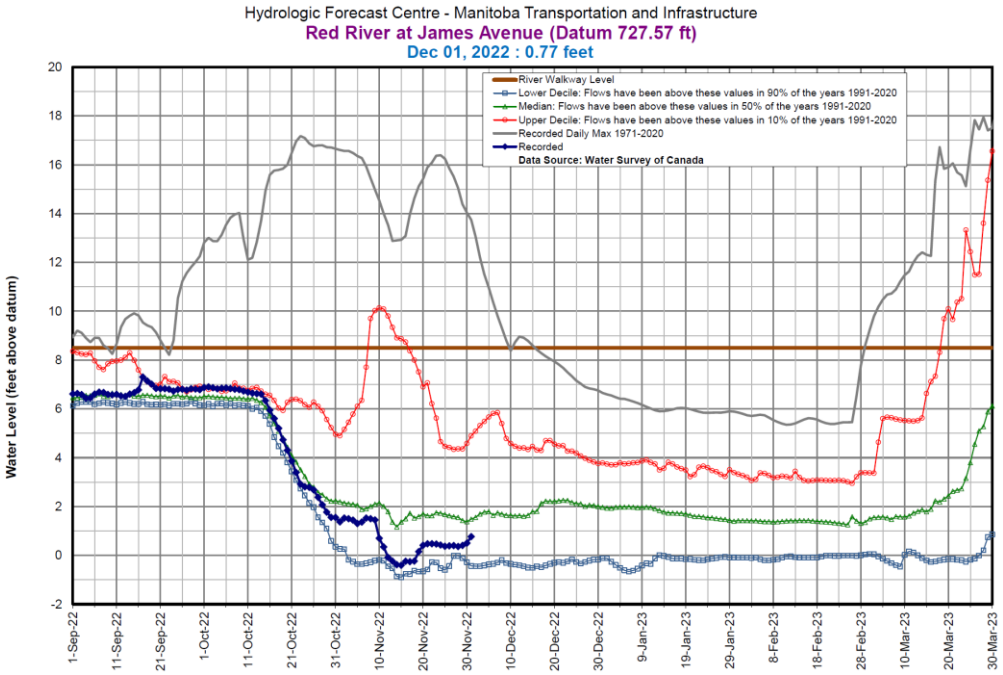

Figure 11. Red River water levels at James Avenue

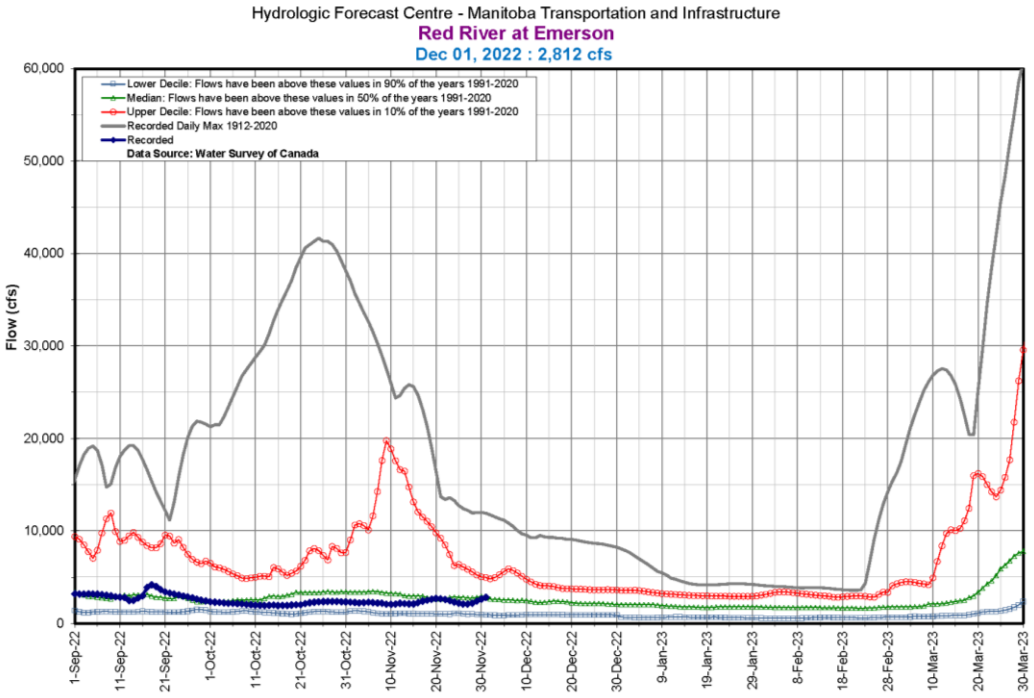

Figure 12. Red River flows near Emerson

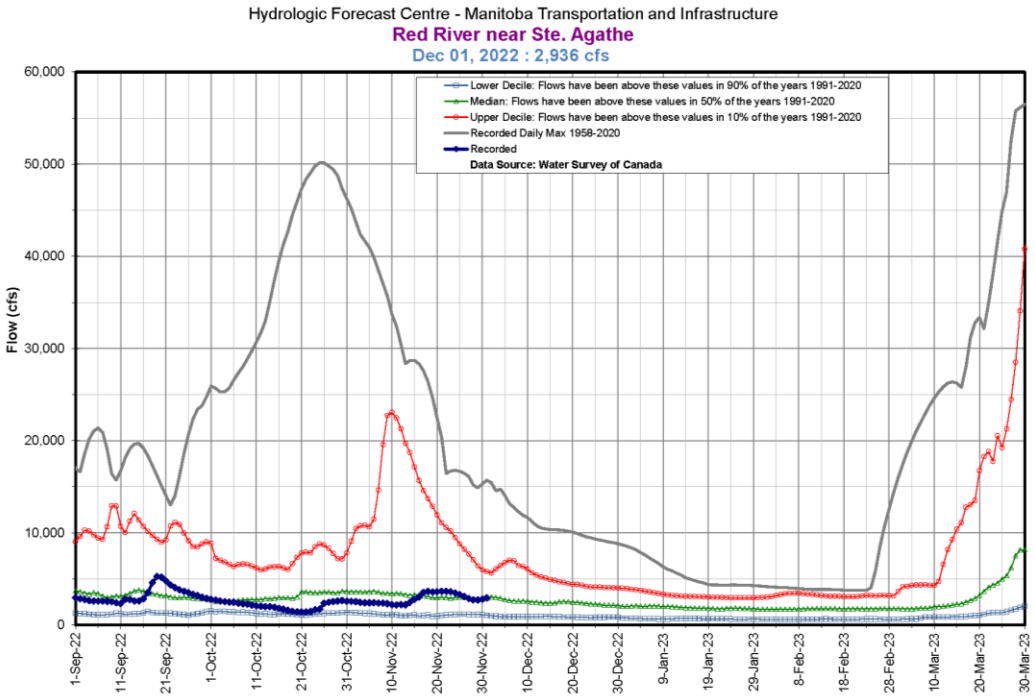

Figure 13. Red River flows near Ste. Agathe

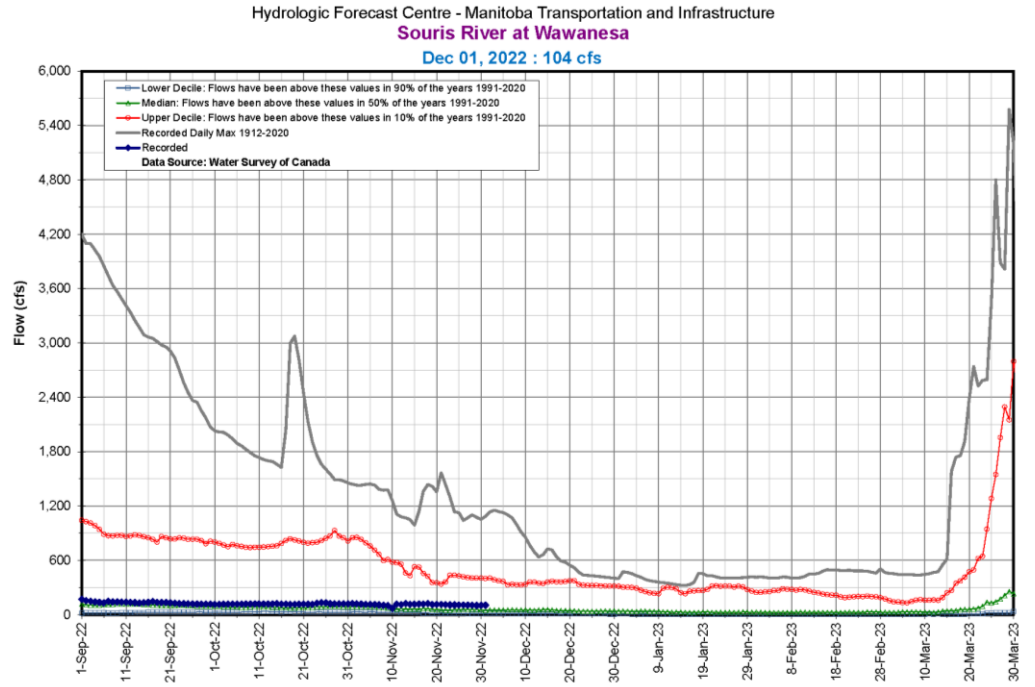

Figure 14. Souris River flows at Wawanesa

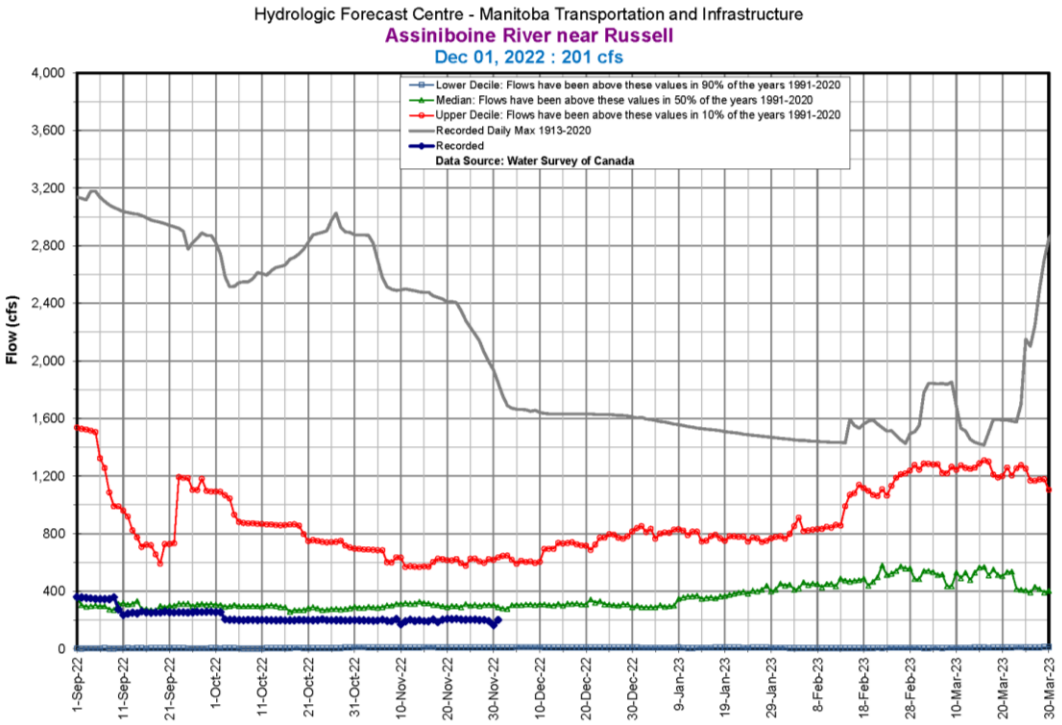

Figure 15. Assiniboine River flows near Russell

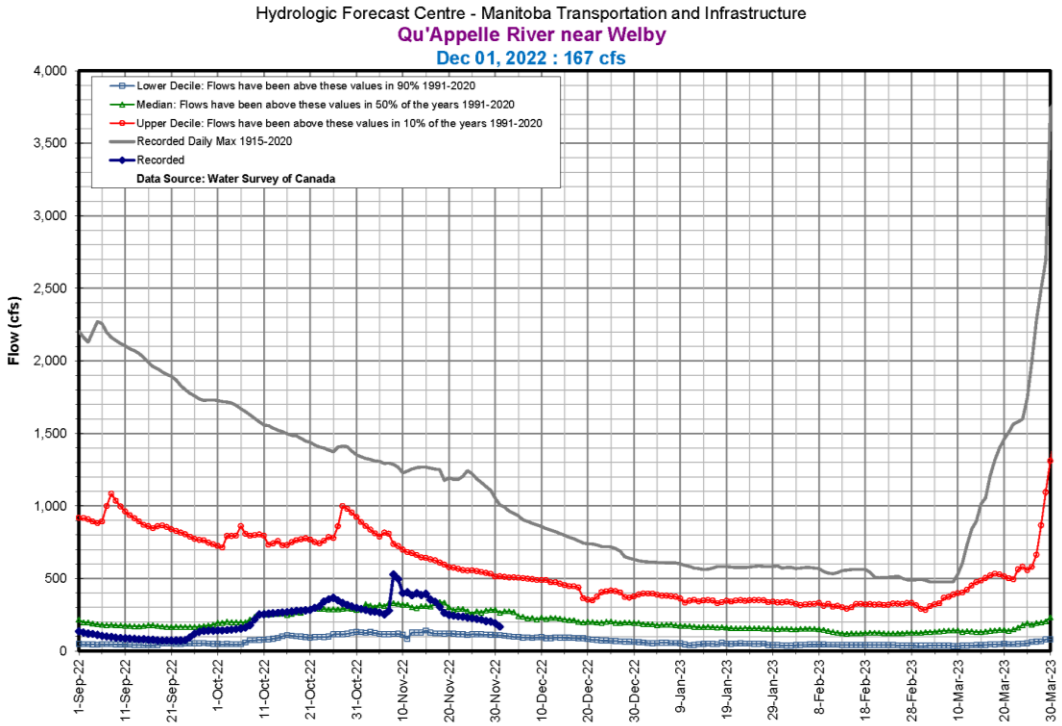

Figure 16. Qu'Appelle River flows near Welby

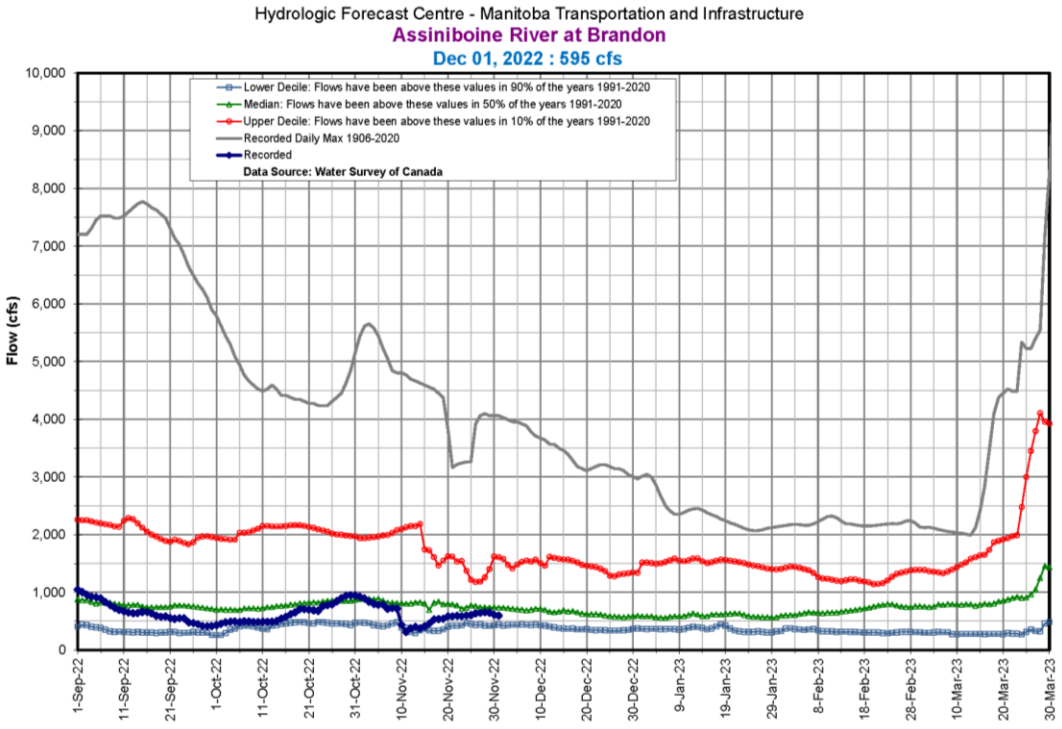

Figure 17. Assiniboine River flows at Brandon

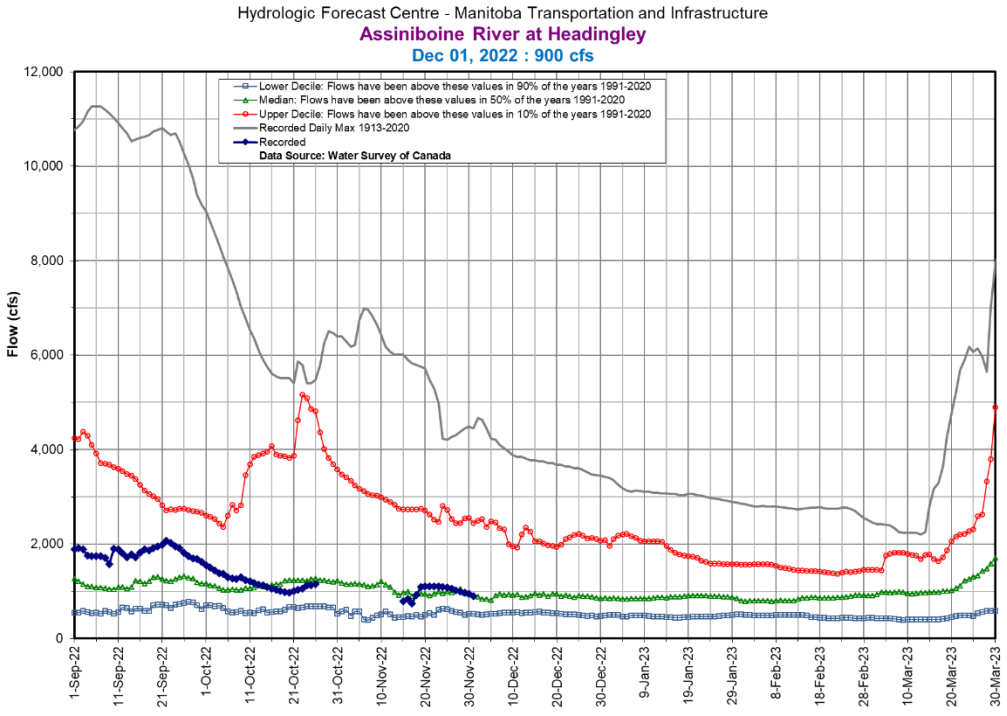

Figure 18. Assiniboine River flows at Headingley

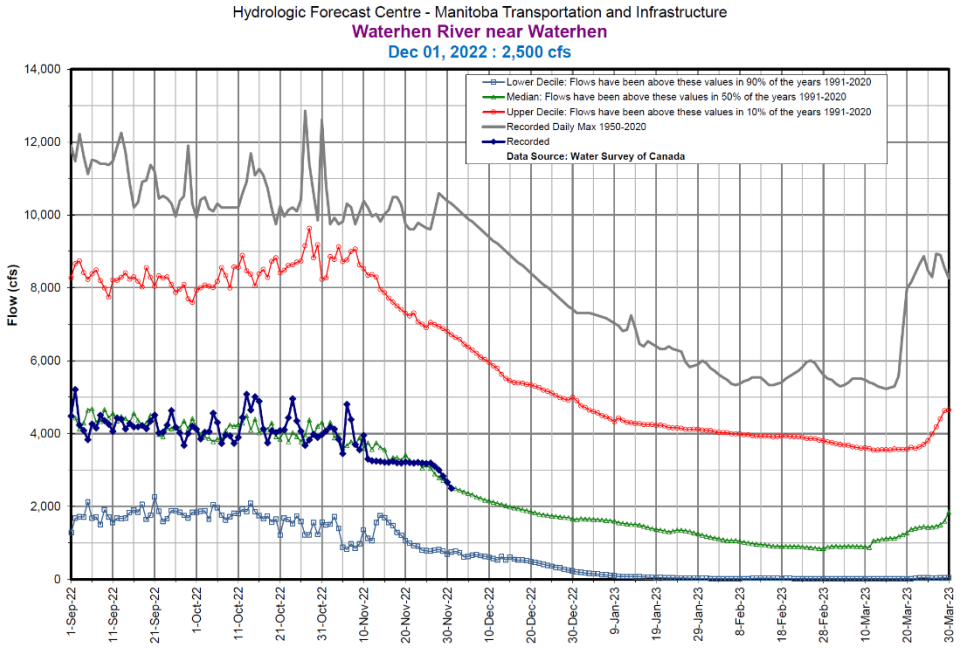

Figure 19. Waterhen River flows near Waterhen

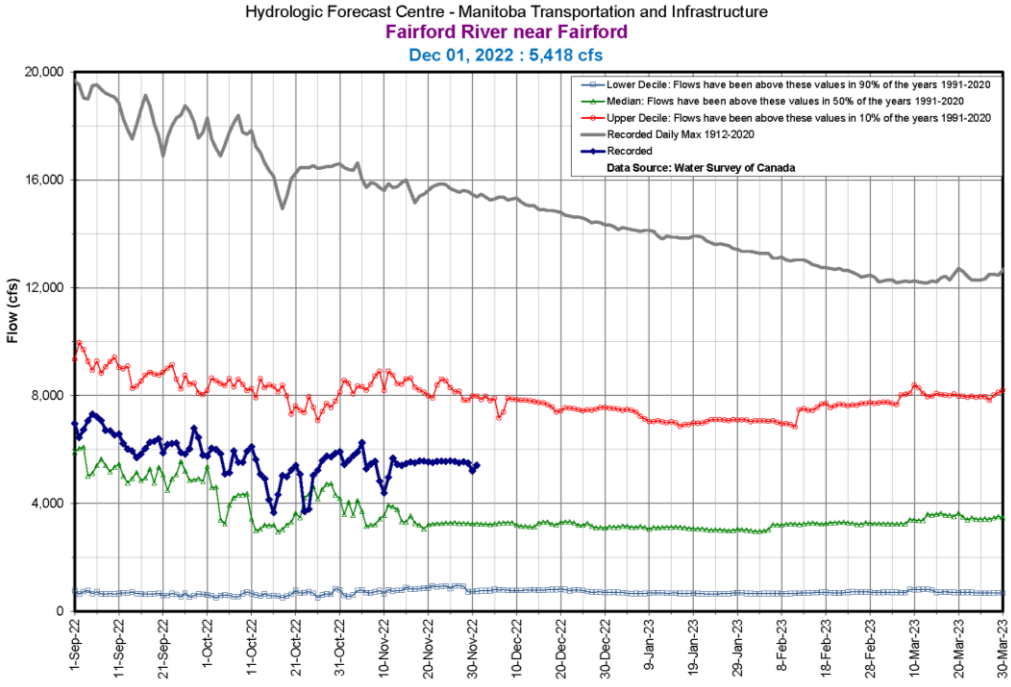

Figure 20. Fairford River flows near Fairford

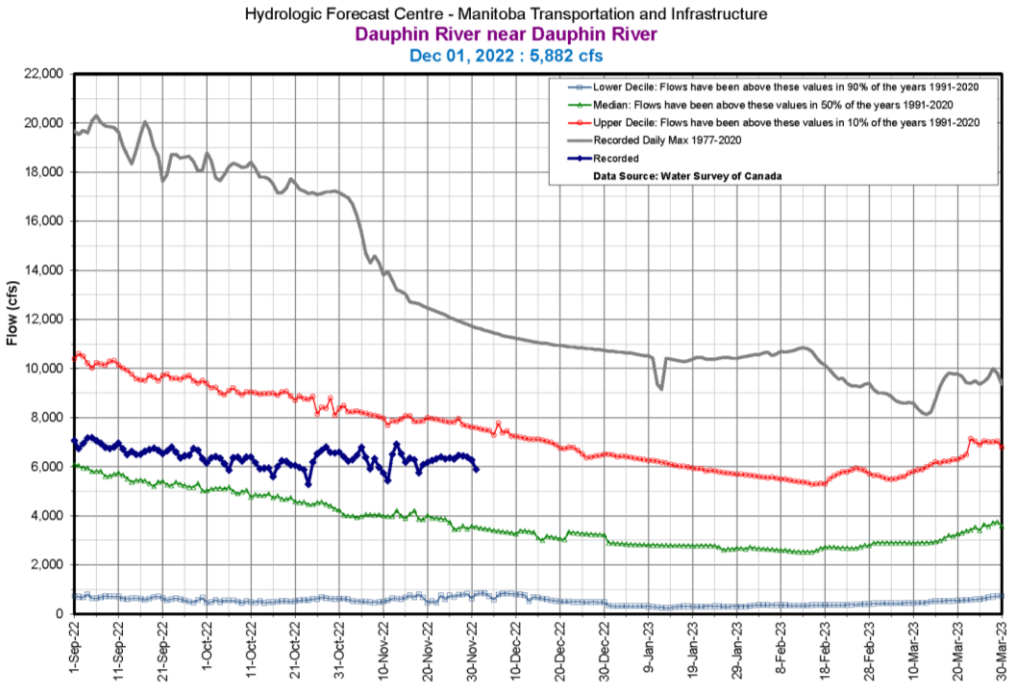

Figure 21. Dauphin River flows near Dauphin River

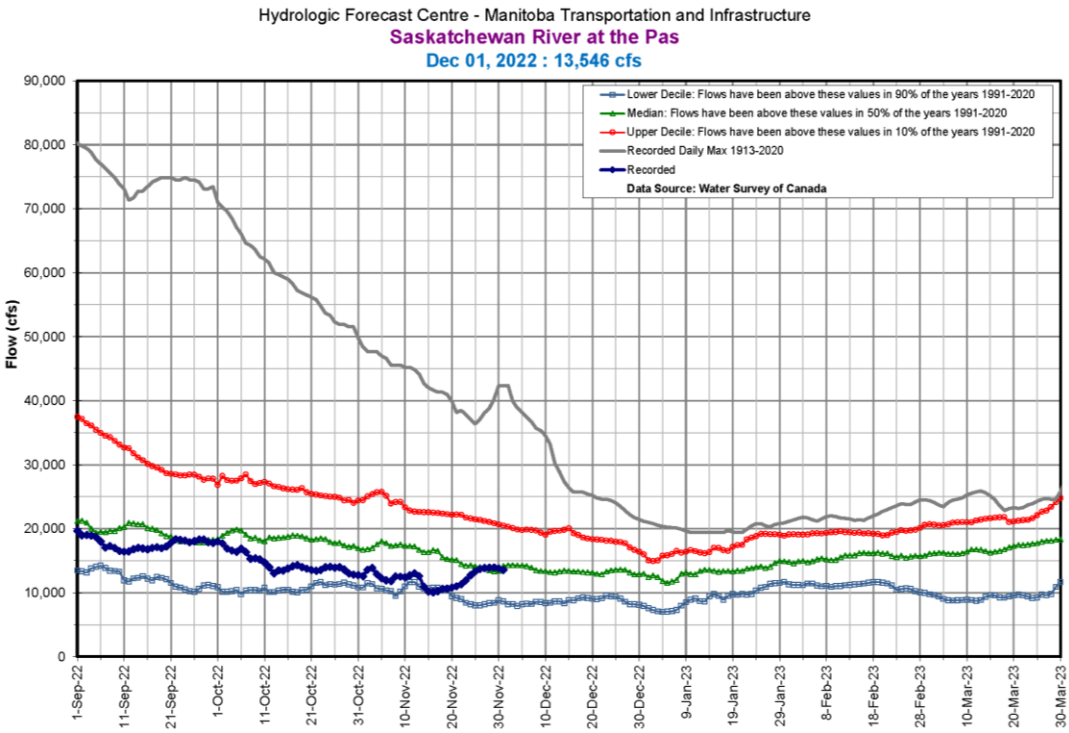

Figure 22. Saskatchewan River flows at The Pas

Table 1. Flows for main rivers at selected locations as of December 1, 2022.

**Note – The Assiniboine River flows and levels are regulated by the operation of Shellmouth Dam.*

** Note – The Red River Level at James Avenue is measured in relative to the long term mean winter ice level at James avenue, which is 727.57 feet geodetic or 0 ft James.*

Rivers	Location	Most Recent Flow/Level (Dec 1)	Minimum Flows/Levels	10th Percentile	Normal flows/Levels	90th Percentile	Maximum Flow/Level	Period of Record
Red River	Emerson	2,812 cfs	28 cfs (1936)	280 cfs	1,652 cfs	3,420 cfs	11,901 cfs (2019)	109 years
	Ste. Agathe	2,936 cfs	219 cfs (1976)	539 cfs	2,522 cfs	4,937 cfs	15,715 cfs (2019)	61 years
	*James Avenue Level **	.77 ft	-2.07 ft (1988)	-1.25 ft	1.22 ft	4.14 ft	13.74 ft (2019)	50 years
Assiniboine River*	Russell	201 cfs	20 cfs (1968)	64 cfs	265 cfs	528 cfs	1,847 cfs (2010)	109 years
	Brandon	595 cfs	45 cfs (1937)	105 cfs	540 cfs	1,017 cfs	4,061 cfs (2010)	109 years
	Holland	800 cfs	215 cfs (1967)	436 cfs	1,039 cfs	1,332 cfs	4,450 cfs (2016)	61 years
	Headingley	900 cfs	120 cfs (1940)	200 cfs	728 cfs	1,262 cfs	4,450 cfs (2016)	109 years
Shellmouth Dam Release	Shellmouth	195 cfs	97 cfs (2001)	151 cfs	397 cfs	621 cfs	1,600 cfs (2010)	53 years
Souris River	Wawanesa	104 cfs	0 cfs (1938)	4 cfs	97 cfs	253 cfs	1,084 cfs (2014)	109 years
Qu'Appelle River	Welby	167 cfs	7 cfs (1988)	52 cfs	248 cfs	451 cfs	1,006 cfs (2010)	79 years
Fairford River	Fairford	5,418 cfs	38 cfs (1964)	204 cfs	3,023 cfs	6,710 cfs	15,362 cfs (2011)	67 years
Waterhen River	Waterhen	2,500 cfs	54 cfs (1963)	597 cfs	2,682 cfs	5,015 cfs	10,312 cfs (1954)	71 years
Dauphin River	Dauphin	5,882 cfs	248 cfs (1988)	425 cfs	3,076 cfs	6,908 cfs	11,654 cfs (2011)	45 years
Saskatchewan River	The Pas	13,546 cfs	2,571 cfs (1929)	4,732 cfs	10,497 cfs	16,033 cfs	42,378 cfs (1954)	109 years
Fisher River (*data for October 31*)	Dallas	202 cfs	6 cfs (1990)	8 cfs	113 cfs	123 cfs	3,408 cfs (2010)	62 ears
Winnipeg River	Pointe du Bois GS	21,366 cfs	-	19,400 cfs	31,800 cfs	54,700 cfs	-	-

Lakes

Lake Manitoba is at 812.1 ft, which is within its operating range of 810.5 ft – 812.5 ft (Table 2). Lake Winnipeg is at 714.5 ft, which is within its operating range of 711 ft – 715 ft but near the upper quartile level for this time of year. Lake St. Martin is at 800.1 ft, which is above normal for this time of the year and is at its upper end of operating range (797.0 ft – 800.0 ft). Dauphin Lake is at 855.7 ft, which is above its operating range of 853.0 ft – 854.8 ft and tracking near the upper decile level for this time of year. Lake Winnipegosis is at 830.9 ft which is slightly above normal for this time of year. Water level hydrographs for these lakes are shown in Figures 23 to 27. After higher than normal water levels for much of the spring and summer, Whiteshell Lakes are currently tracking near normal conditions for this time of the year. Inflow into Lake of the Prairies (Shellmouth Reservoir) is tracking near normal condition for this time of the year.

Shellmouth Dam is being operated in consultation with the Shellmouth Reservoir Regulation Liaison Committee (SLC). The lake level as of December 1 was 1399.4 ft. The operating guidelines recommend that the lake level be drawn down between 1386 ft and 1400 ft prior to spring runoff depending on the forecasted spring runoff volume. Regular spring runoff forecasts will be issued and the lake level will be dropped to the appropriate level prior to the spring runoff in order to prevent downstream flooding while also storing sufficient water for water supply purposes and upstream reservoir users. Figure 28 shows the observed and forecasted lake levels, reservoir inflow, and reservoir outflow until January 19, 2023. The outflow and level forecasts were made for the median future inflow conditions. As conditions on the ground change, a revised inflow forecast will be issued and the outflow from the reservoir will be adjusted accordingly.

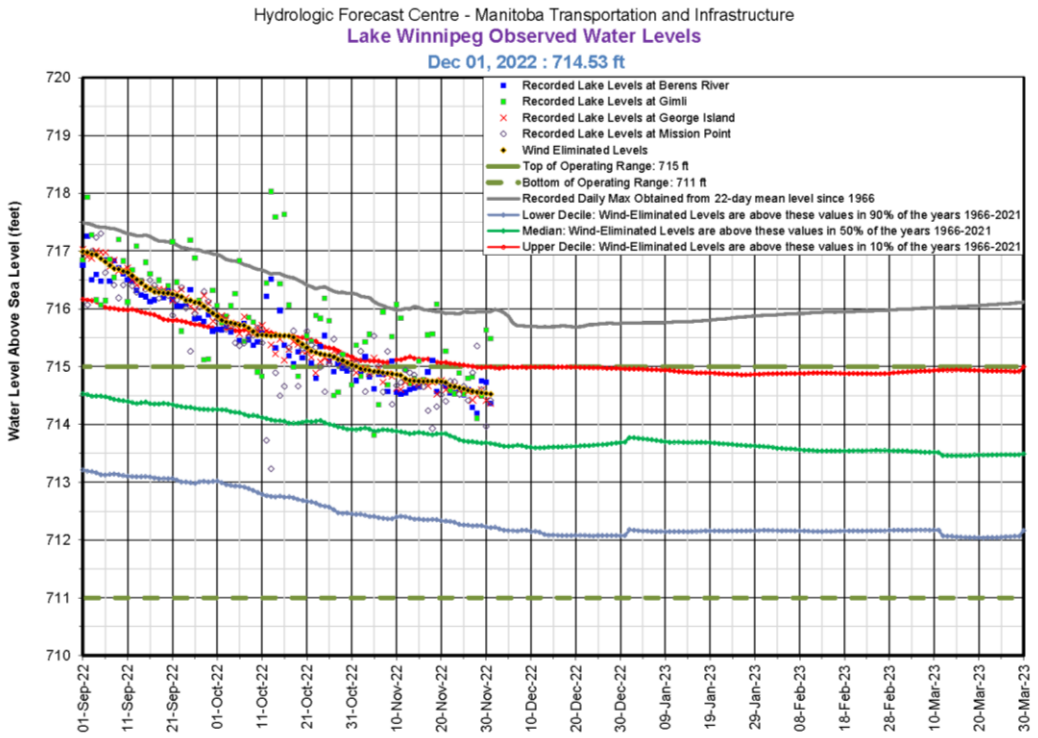

Figure 23. Lake Winnipeg water levels

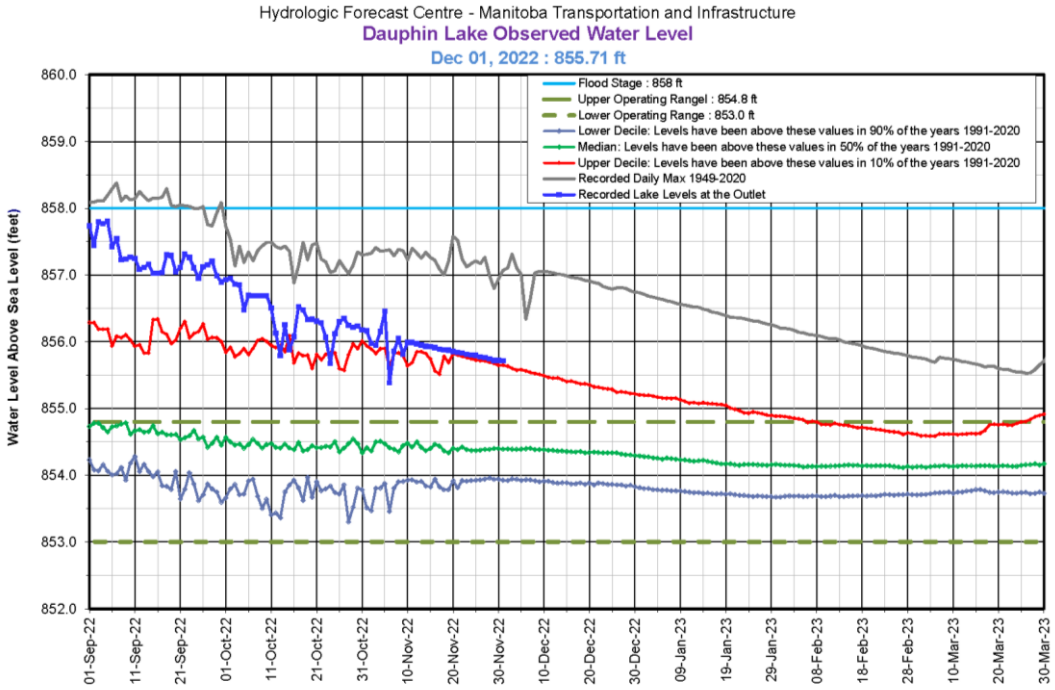

Figure 24. Dauphin Lake water levels

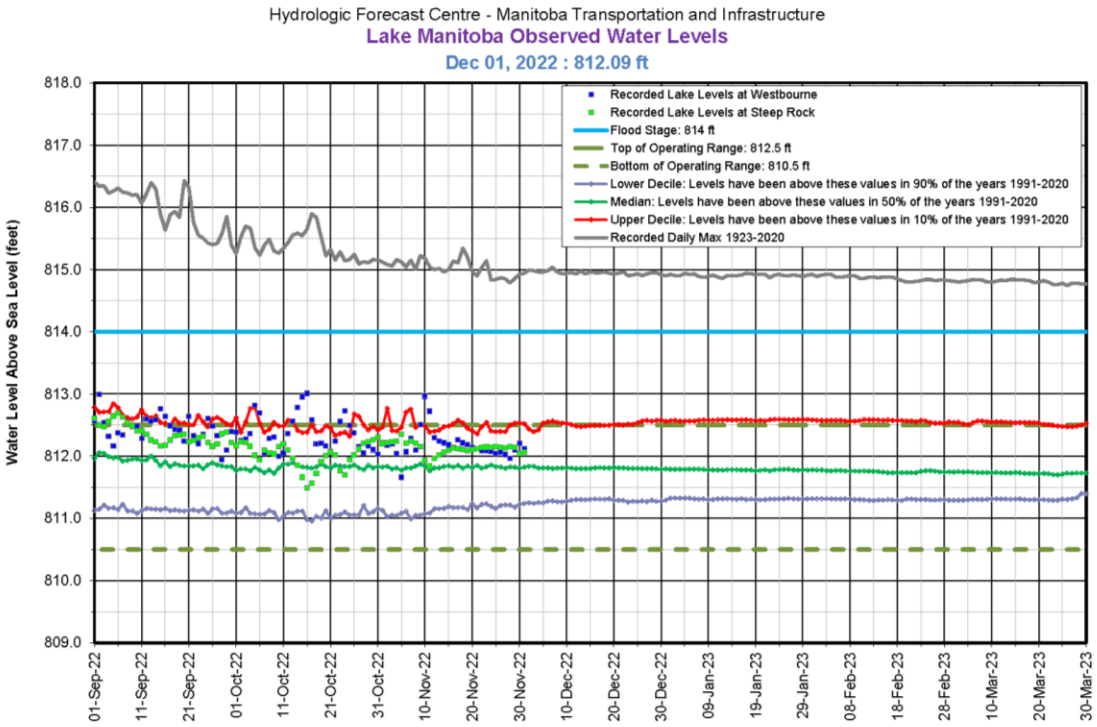

Figure 25. Lake Manitoba water levels

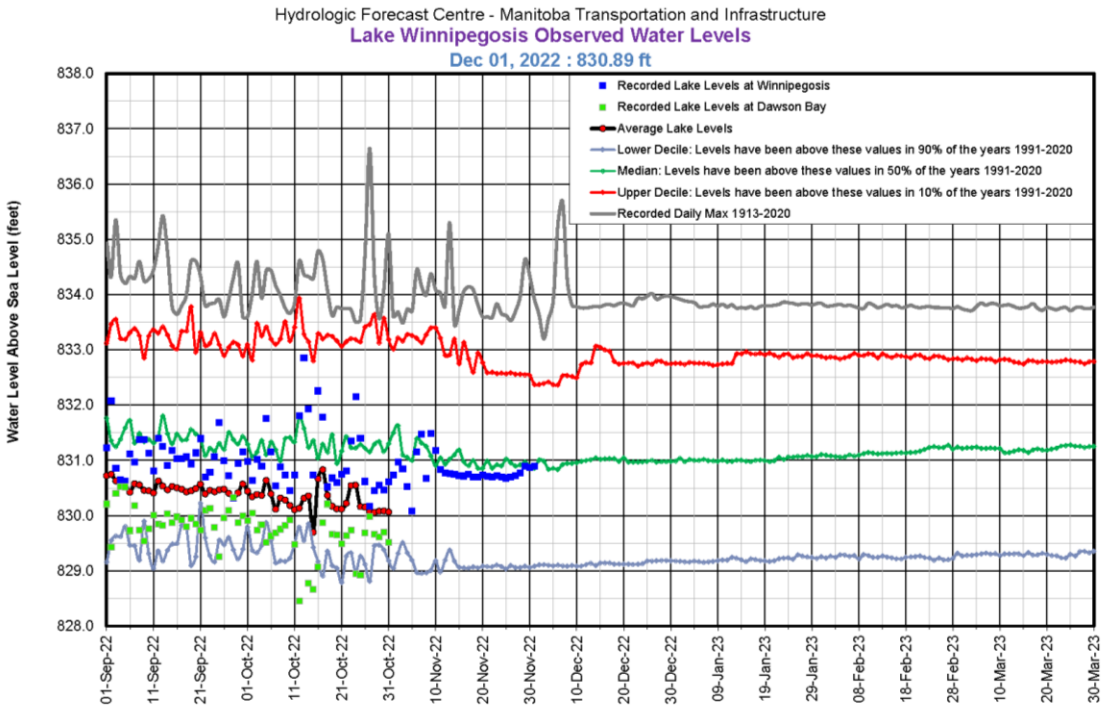

Figure 26. Lake Winnipegosis water levels

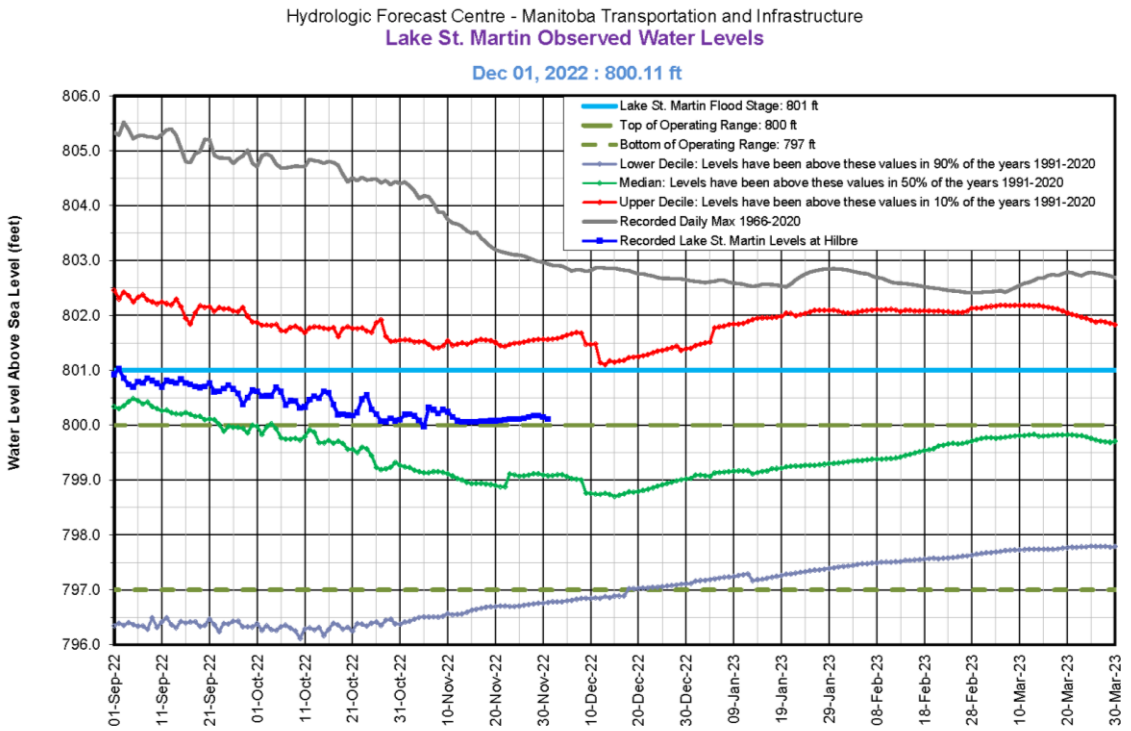

Figure 27. Lake St. Martin water levels

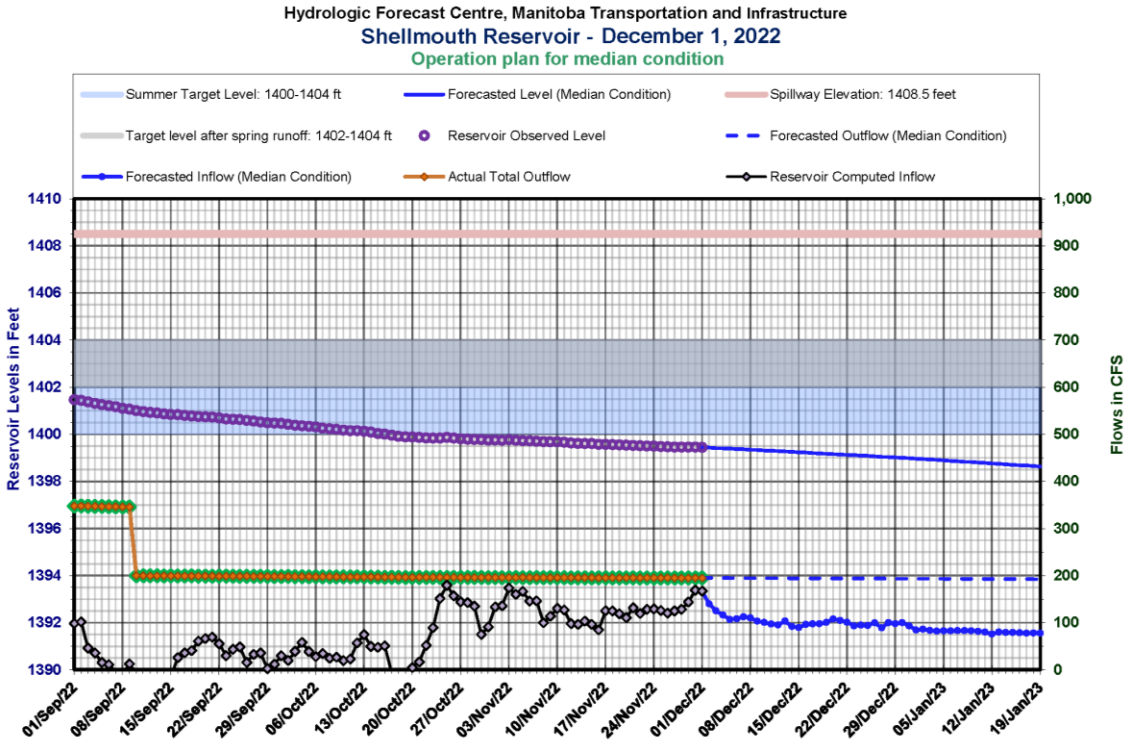

Figure 28. Lake of the Prairies (Shellmouth Reservoir) water levels and flows

WINTER PRECIPITATION (LONG TERM PRECIPITATION OUTLOOK)

Global weather prediction centres indicate that a La Nina climate condition is expected to persist through the winter and spring. The effect of La Nina is variable across the globe but generally it is characterized by above normal precipitations in some areas and below normal precipitation in other areas. For most central and southern Manitoba basins, however, La Nina conditions generally favour near normal to below normal precipitation from December to April.

Environment and Climate Change Canada (ECCC) issued a long term precipitation outlook in November for the winter period (Figures 29 and 30). Based on the outlook, precipitation is expected to be above normal from December to February for central and northern Manitoba and northern Saskatchewan and potentially the southeast corner of Manitoba. For most of southern Manitoba and southern Saskatchewan near normal winter precipitation is expected. The U.S. National Weather Service (NWS) Climate Prediction Center's outlook issued on November 17, 2022 forecasts higher chance for above normal precipitation within the U.S. portion of the Red and Souris River basins between December and March (Figures 31 and 32).

Long range climate projections issued by Columbia Climate School International Research Institute (IRI), which predicts probabilistic seasonal climate based on model output from U.S. National Oceanographic and Atmospheric Administration (NOAA) and Environment and Climate Change Canada (ECCC), indicate normal to below normal precipitation across Manitoba for December to March (Figure 33 and 34).

Experience indicates that long term precipitation outlooks are more accurate for the first month of the forecast time frame and forecast modelling results start to deviate significantly further into the future. Generally, long term weather forecasts are not as reliable as short term forecasts.

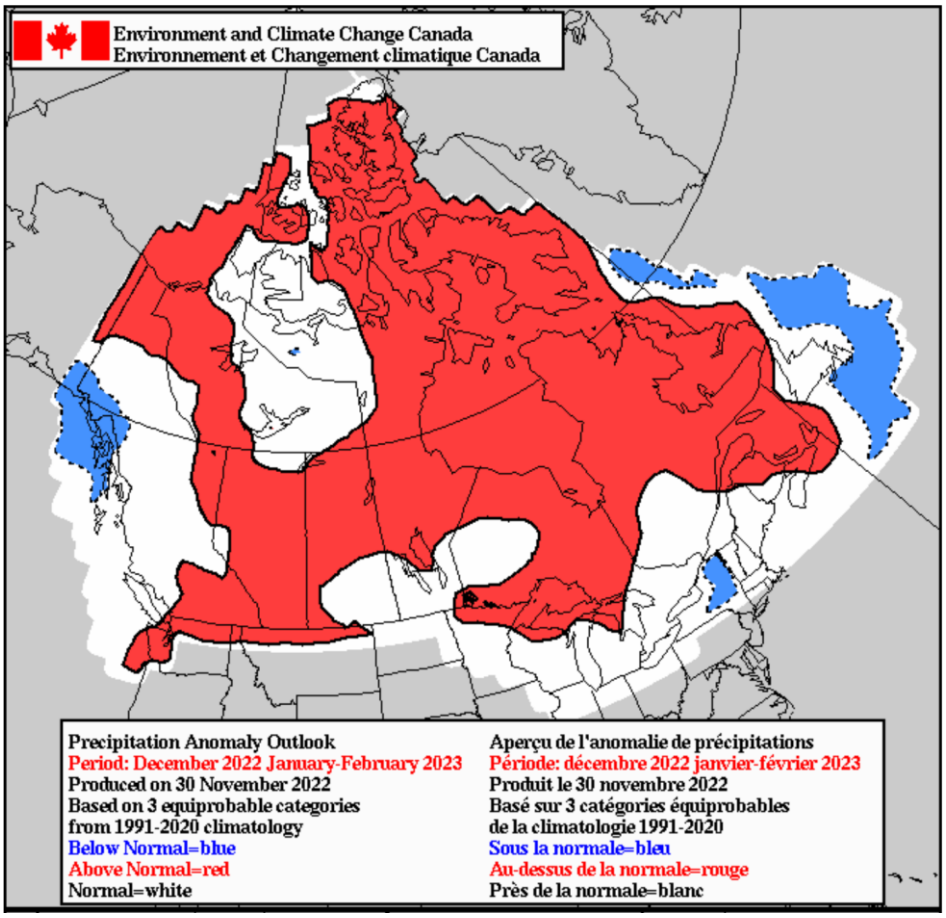

Figure 29. Environment and Climate Change Canada's Deterministic Precipitation Outlook (December to February).

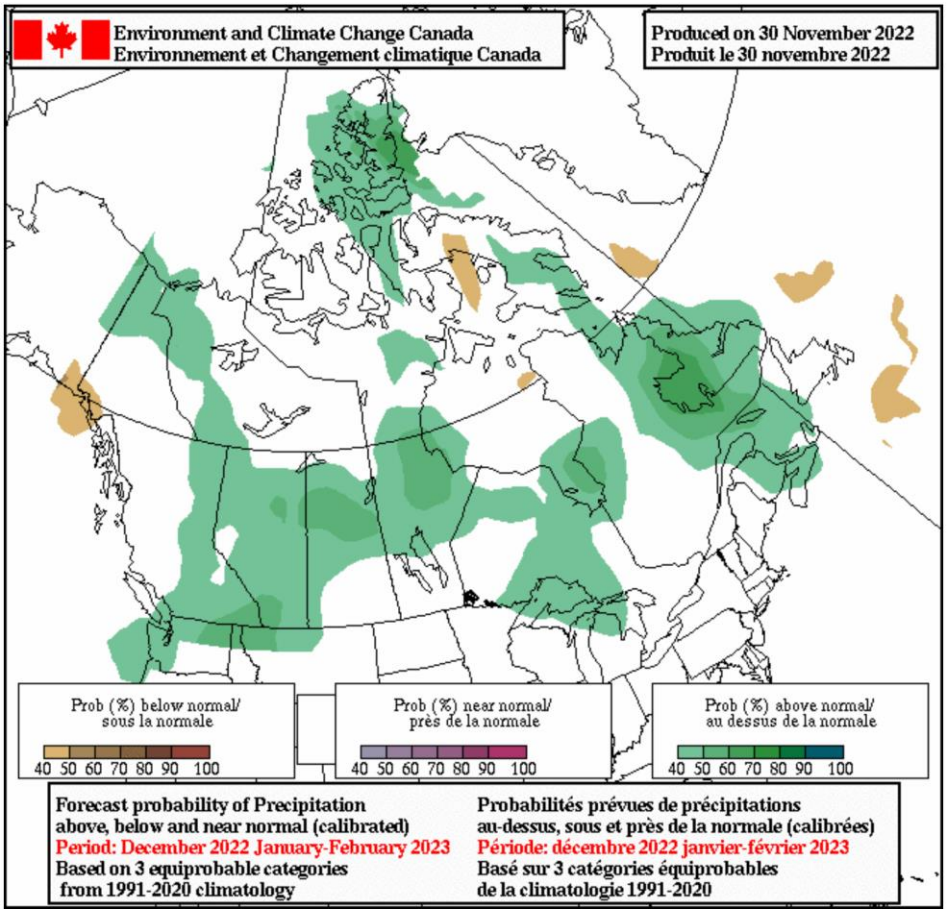

Figure 30. Environment and Climate Change Canada's Probabilistic Precipitation Outlook (December to February).

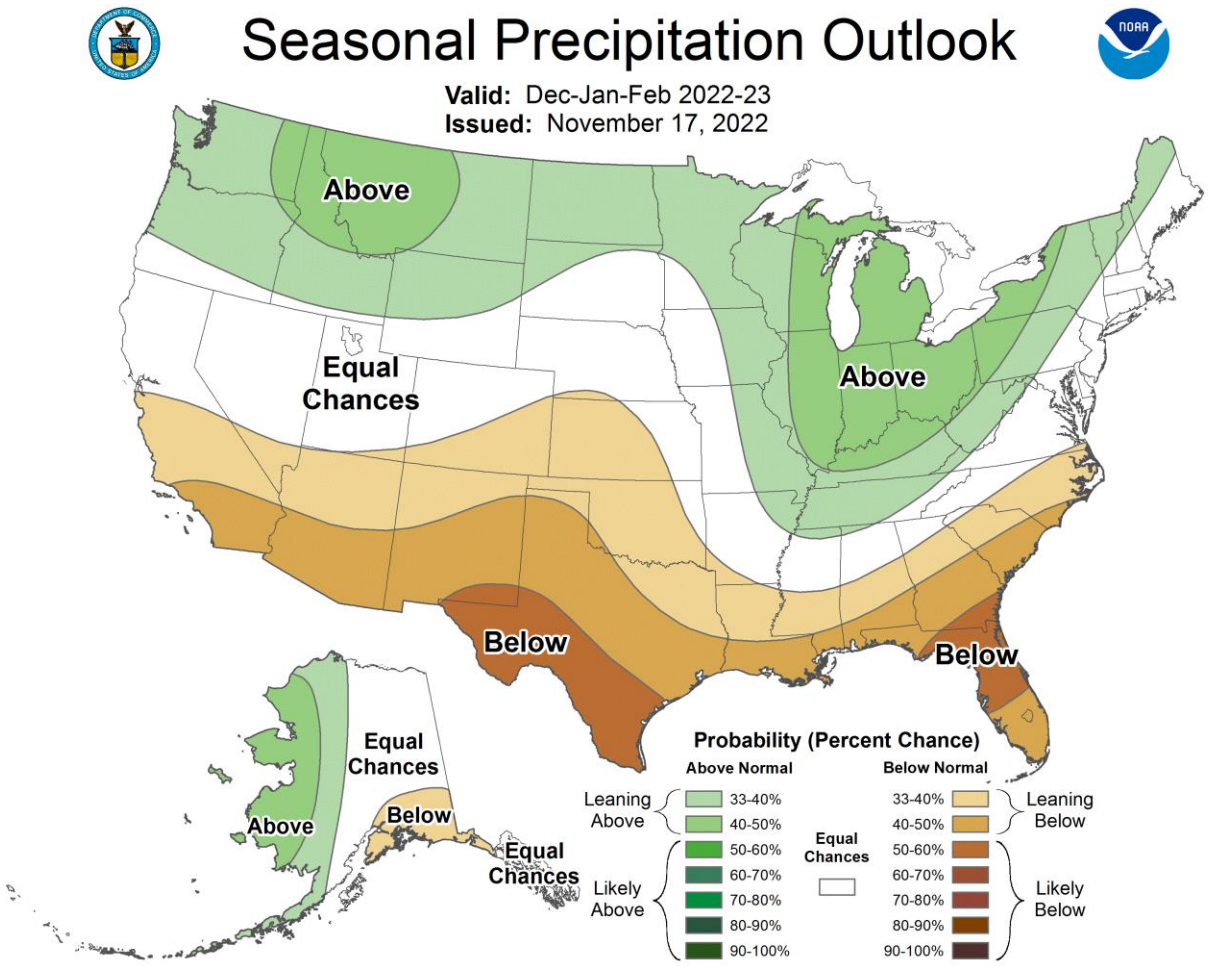

Figure 31. National Weather Services' precipitation outlook (December to February)

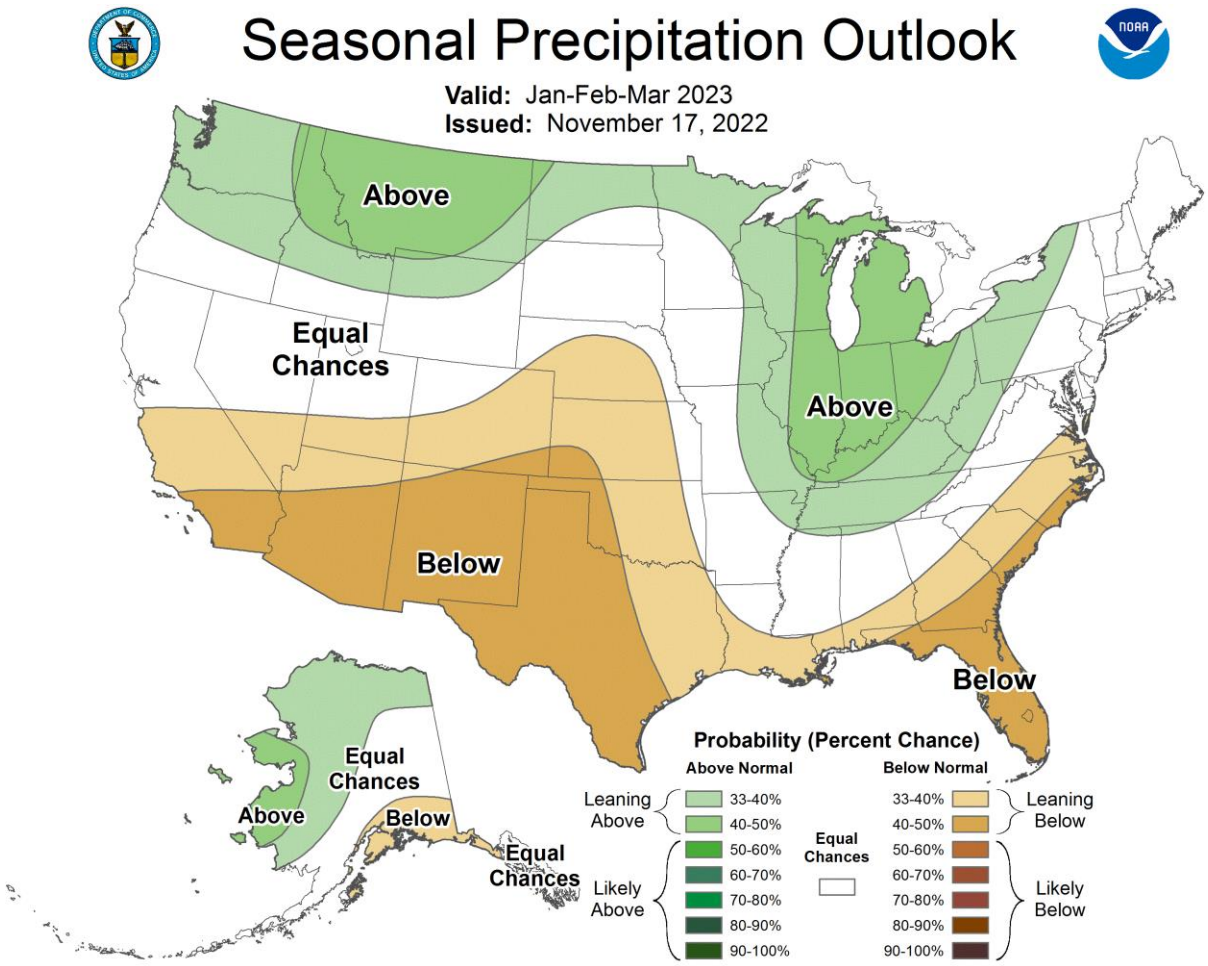

Figure 32. National Weather Services' precipitation outlook (January to March)

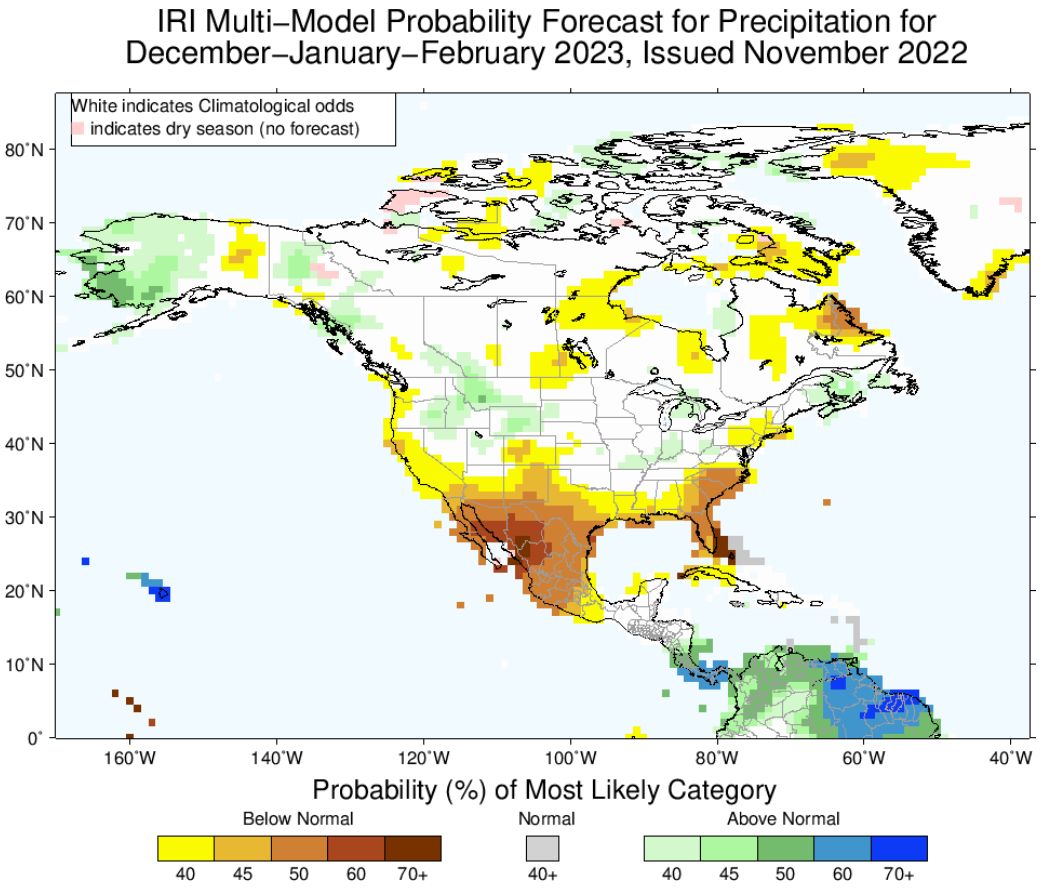

Figure 33. Columbia Climate School International Research Institute's Multi-Model Probabilistic Precipitation Outlook (December to February)

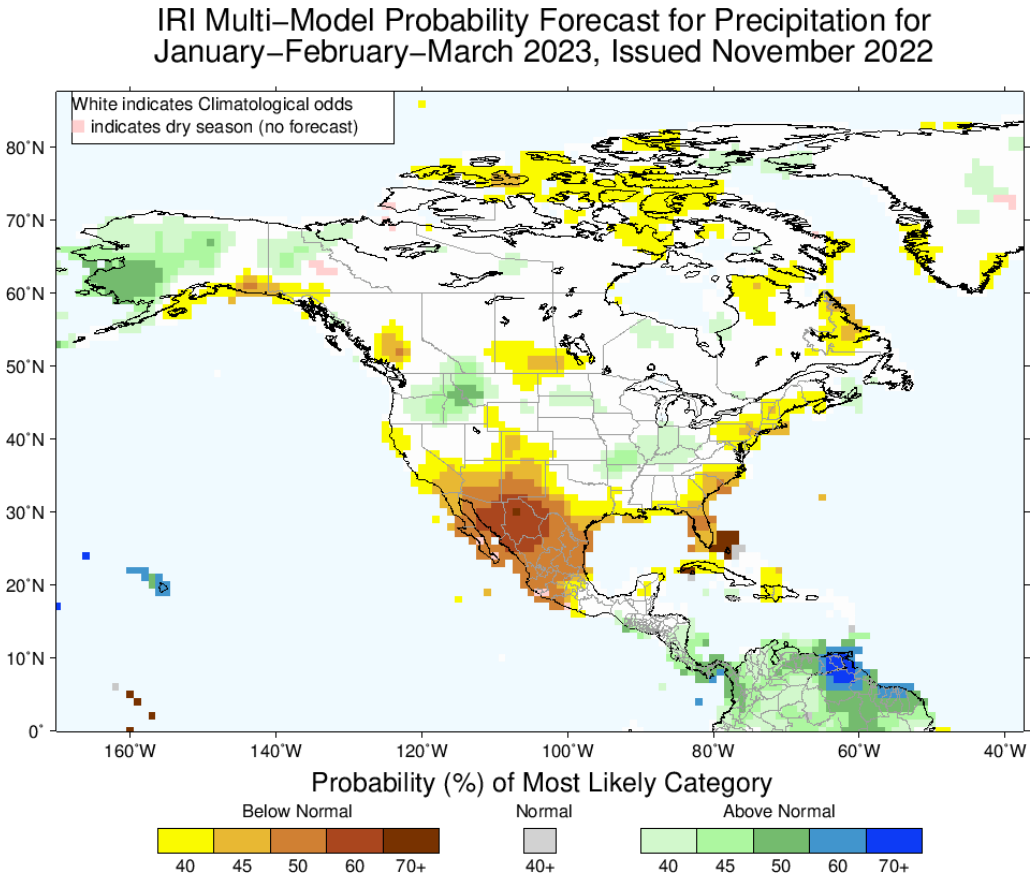

Figure 34. Columbia Climate School International Research Institute's Multi-Model Probabilistic Precipitation Outlook (January to March)

FORECASTED LAKE LEVELS AND RIVER FLOWS OVER THE WINTER PERIOD

Providing reliable forecasts of river flows through the winter (which are also called base flows) is extremely difficult due to frozen ground conditions and the effect of ice on flows and levels on rivers and lakes. The Assiniboine River is forecasted to remain at near normal flows and levels in the period prior to the spring runoff. Flows on the Assiniboine River are partly being controlled by the sustained release of outflows from the Shellmouth Reservoir in order to reduce the level in the reservoir in preparation for the spring runoff. Flows and levels on the Red River are expected to maintain near normal conditions in the period prior to the spring runoff. Flows on the Waterhen River will remain near normal, while the Fairford River and Dauphin River will continue to be above normal.

Lake Manitoba is expected to remain near or slightly below 812 ft throughout the winter. Lake Winnipeg is expected to be near 714 ft by end of March, which will be near the historic upper quartile level for March 31st. Lake Winnipegosis will remain near the current level of 830.9 ft throughout the winter and Lake St. Martin is expected to be slightly below 801 ft before the spring runoff. Recorded lake levels (as of December 1, 2022) and expected levels prior to the 2023 spring runoff (by March 31, 2023) are given in Table 2.

Table 2. December 1 lake levels and expected levels by March 31, 2023 (before the 2023 spring runoff).

***Levels on these lakes are managed by operation of dam structures.*

Lakes	Current level, Dec 01 (ft)	Operating range or long term avg. (ft)	Normal level for Dec 01 (ft)	Last time level was equal or higher than the current level	Expected Level by Mar 31, 2023 (ft)	Historical comparison
Lake Manitoba*	812.1	810.5 - 812.5	811.9	812.2 (2017)	≈ 812.0	*Historic water level for this time of year is above the current level 28% of the time*
Lake Winnipeg*	714.5	711 - 715	713.7	715.0 (2019)	≈ 714.0	*Historic water level for this time of year is above the current level 22% of the time*
Lake St. Martin*	800.1	797 - 800	798.4	801.4 (2017)	≈ 801.0	*Historic water level for this time of year is above the current level 19% of the time*
Lake Winnipegosis	830.9	830.2	830.2	831.9 (2018)	≈ 830.9	*Historic water level for this time of year is above the current level 29% of the time*
Dauphin Lake*	855.7	853.0 - 854.8	854.2	857.1 (2016)	854.8 – 855.2	*Historic water level for this time of year is above the current level 6% of the time*
Shellmouth Reservoir*	1399.4	1386 - 1400	1399.9	1399.9 (2020)	1386 – 1398	*Historic water level for this time of year is above the current level 52% of the time*
Lake Wahtopanah near Rivers*	1535.8	1535.5	1534.6	1535.8 (2019)	1532 – 1534	*Historic water level for this time of year is above the current level 18% of the time*
Lake Minnewasta	1080.3	1079.1	1079.1	1082.3 (2019)		*Historic water level for this time of year is above the current level 43% of the time*

SUMMARY

The Hydrologic Forecast Centre will continue working collaboratively with Environment and Climate Change Canada, the National Weather Service and flood forecasters in neighbouring jurisdictions to monitor watershed conditions and winter precipitation patterns.

At this point in time, it is not practical or feasible to provide a reliable long-term flood forecast for spring 2023 as conditions could change significantly during the coming months. Basins with normal to above normal soil moisture conditions, base flow, and lake level conditions indicate a higher chance for normal to above normal flows and levels in spring runoff. However, there will be a lower chance of receiving above normal spring runoff if less winter or spring precipitation and a gradual snowmelt occur. Conversely, the risk of spring flooding could increase if heavy winter precipitation occurs, or if a fast snowmelt rate or heavy rainfall were to occur in early spring.

Looking back at some of the most significant historic flood or drought events, each flood or drought event is caused by a combination of multiple unique circumstances. There is an inherent risk of over-estimating or under-estimating the extent of spring runoff if one considers the conditions and available precipitation four months in advance of the spring runoff. The Hydrologic Forecast Centre will continue to monitor watershed conditions closely and will release spring runoff outlooks through the winter as required.

A detailed flood outlook will be published with updated information towards the end of February when further precipitation and other factors are available.