

Water Availability and Drought Conditions Report

AUGUST 2023

Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for August 2023.
- Precipitation conditions over the past month, three month, and twelve month periods are as follows:
 - Highly variable precipitation conditions continued through August. In agri-Manitoba, extremely (<40 % of median) to moderately (60 – 85 %) dry conditions in the south gave way to normal (85 – 115%) or above normal conditions (>115 %) in the north. In northern Manitoba, conditions ranged from severely dry (40 – 60 %) to normal.
 - Over the past three months (June, July, August), agri-Manitoba experienced mostly moderately to severely dry conditions with small regions of extremely dry conditions in central and southwest Manitoba. Conditions in northern Manitoba ranged from moderately dry in the south to normal or above normal in the north.
 - Over the past 12 months, agri-Manitoba observed moderately to severely dry precipitation conditions. In northern Manitoba, precipitation conditions ranged from moderately to severely dry in much of the Nelson and Hayes River basins to normal in the Churchill and Seal River basins.
- As of August 30, 2023, flows and levels in many rivers and lakes have dropped or remain in the below normal (10th – 25th percentile) or much below normal (<10th percentile) categories, predominately within southern Manitoba.
- As of September 5, 2023, most monitored aquifer levels remained in the normal range (25th – 75th percentile), except for three sand and gravel aquifers in southeastern Manitoba that were classified as below normal (10th – 25th percentile) to much below normal (<10th percentile).
- The August 31, 2023 Canadian Drought Monitor assessment showed an increase in the extent of moderate drought (D1) and severe drought (D2) conditions, and development of several regions of extreme drought (D3) in central and southwest agri-Manitoba.
- As of September 4, 2023, provincial water supply reservoirs were generally close to or above full supply, except Stephenfield Reservoir (59 % of full supply) and Jackson Lake (72 % of full supply). Provincial water control structures are being operated to mitigate low water level conditions where possible.
- On-farm water supplies remain highly variable, but generally classified as low across agri-Manitoba. On-farm water supplies are of particular concern on pastures located in areas that have consistently missed rain events this summer.
- As of September 4, 2023, a total of 188,802 hectares have been burned during the 2023 wildfire season, primarily in the western and northern regions. The number of wildfires for this time of year is lower than average. At the time this report was published, no provincial burning or travel restrictions were in place due to wildfire activity. However, eleven communities or municipalities had burning restrictions in place.

Drought Indicators

Precipitation Indicator

Precipitation is assessed to determine the severity of meteorological dryness and is an indirect measurement of agricultural dryness.

Three precipitation indicators are calculated to represent short term (one month; Figure 1), medium term (three months; Figure 2) and long term (12 months; Figure 3) conditions. The indicators compare current monthly precipitation totals to historical data to calculate the per cent of median precipitation that occurred over the past one, three or twelve months. Historical medians are computed from 45 years of data (1971 – 2015).

Due to large distances between meteorological stations in northern Manitoba, the interpolated contours in this region are based on limited observations and should be interpreted with caution.

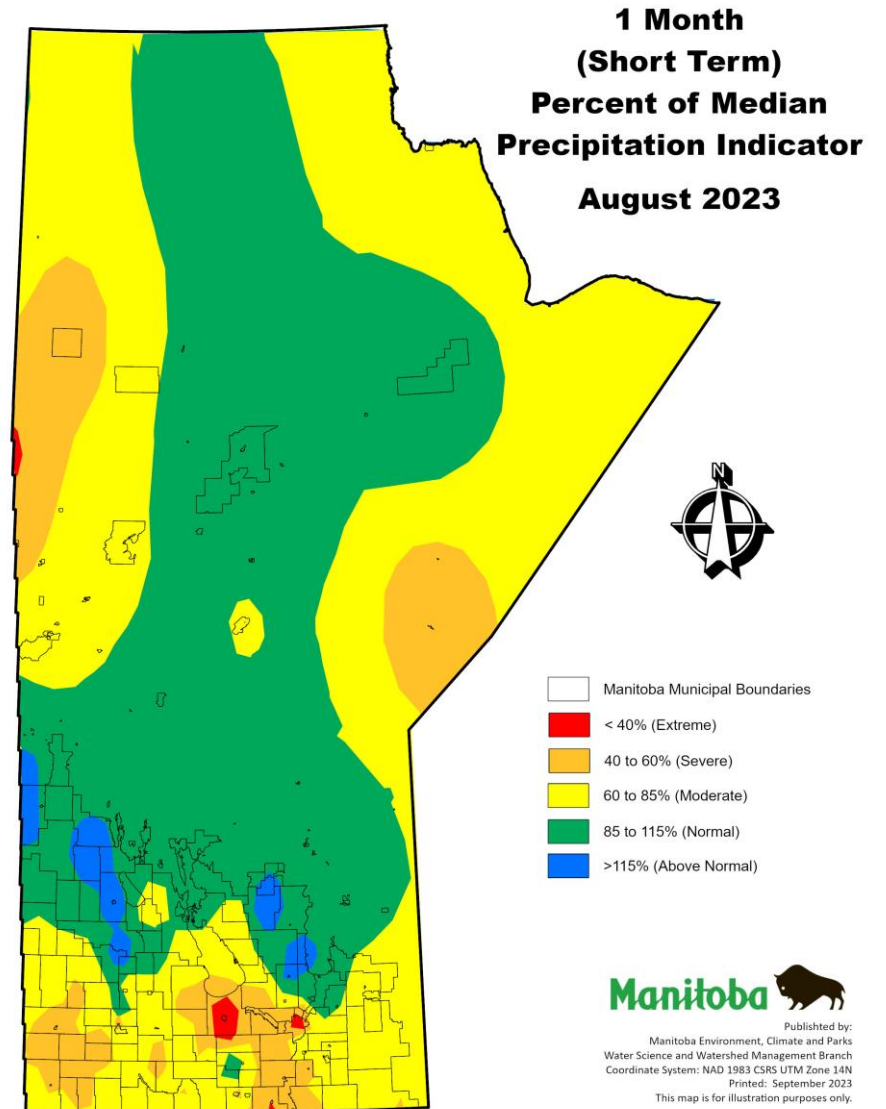


Figure 1: One month (short term) per cent of median precipitation indicator.

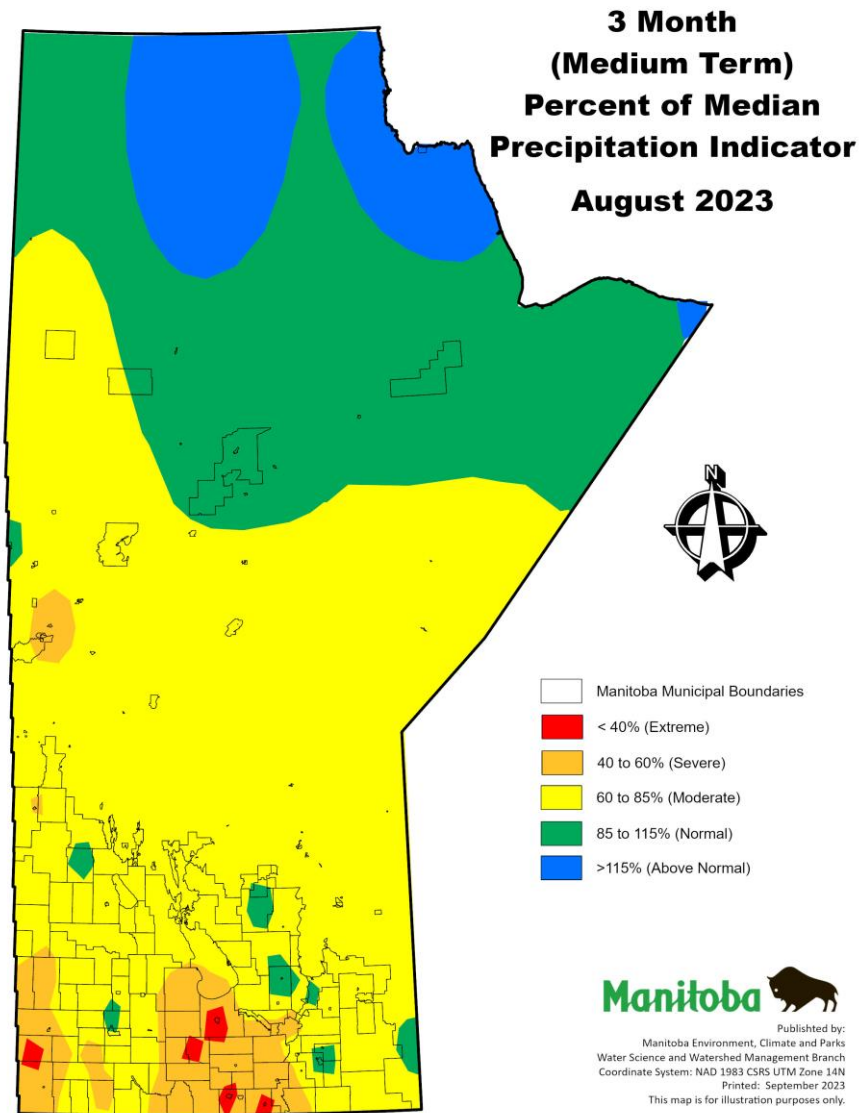


Figure 2: Three month (medium term) per cent of median precipitation indicator.

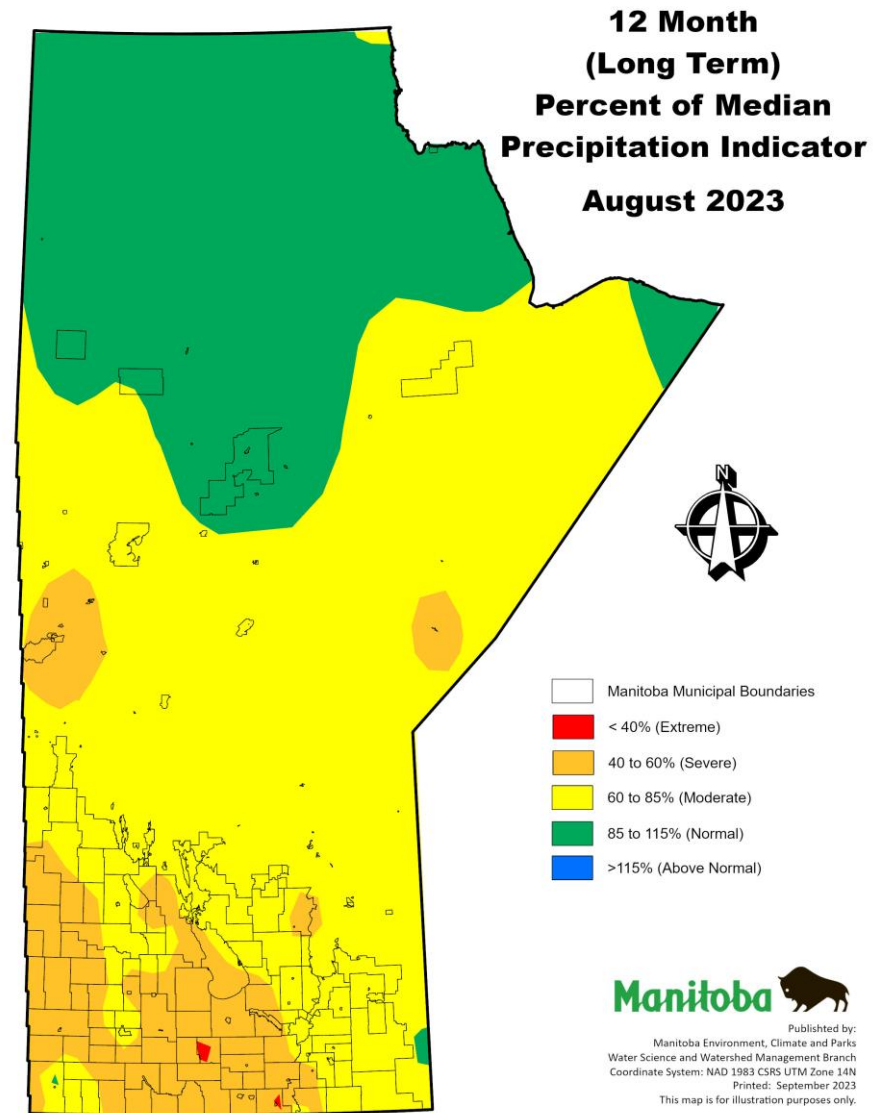


Figure 3: Twelve month (long term) per cent of median precipitation indicator.

Streamflow & Lake Level Indicator

The streamflow and lake level indicator is based on average daily flows and levels compared to historical values for that particular day.

This indicator is used to determine the severity of hydrological dryness in a watershed and is summarized on Figure 4, representing hydrological conditions for August 30, 2023.

Streamflow and lake level percentile plots for all of the rivers and lakes included on Figure 4 are available on the [Manitoba Drought Monitor website](#) under the *Drought Indicator Map* tab.

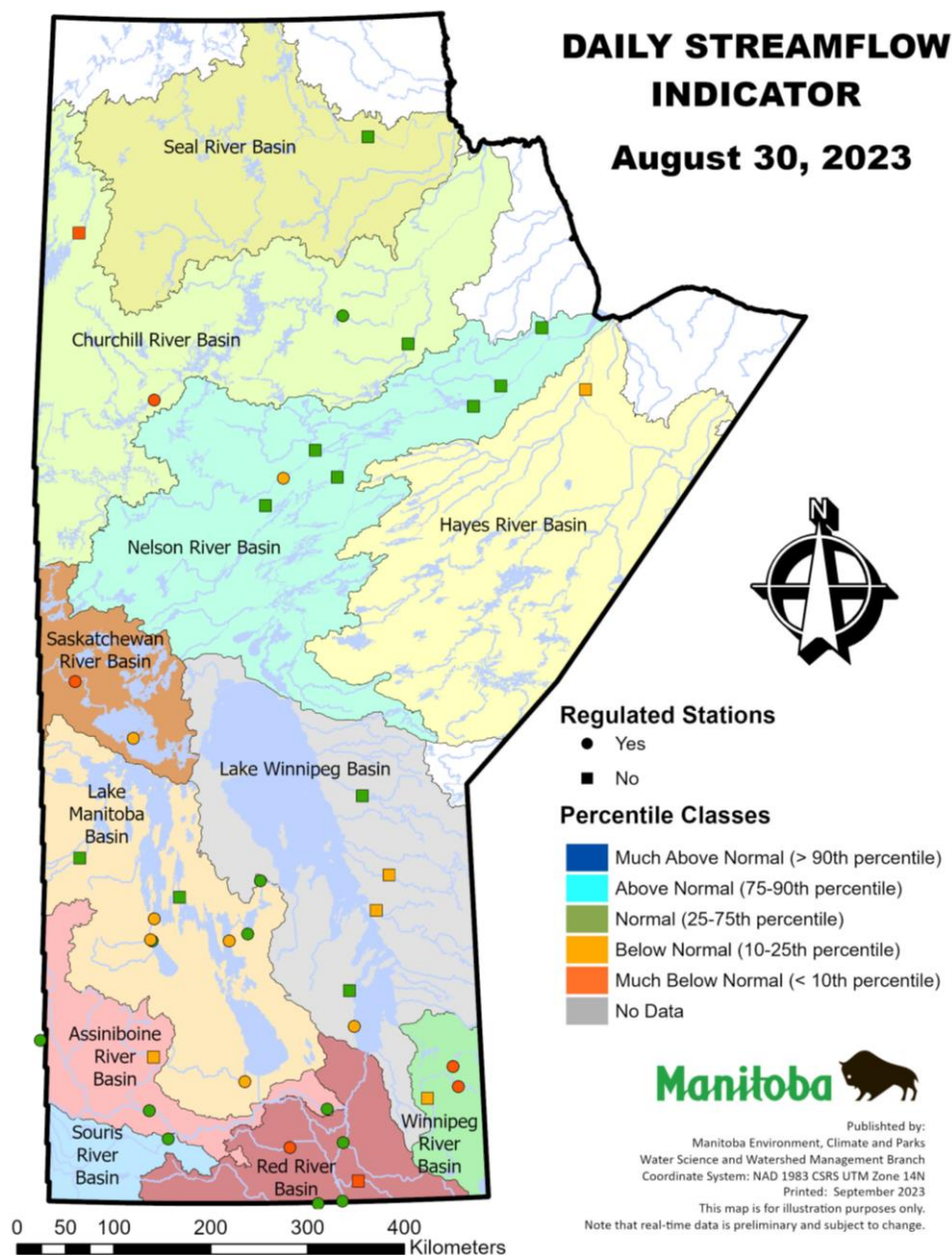


Figure 4: Daily streamflow and lake level indicator for August 30, 2023.

Groundwater Indicator

Water level responses to precipitation fluctuations in most aquifers lag considerably behind surface water responses, so even prolonged periods of below normal precipitation may not have a significant negative effect on groundwater levels. Even at low levels, most aquifers store large amounts of water and can continue to provide water during extended periods of dry weather. However, local conditions may vary from monitoring data and in shallow aquifers with limited extent, some may experience water levels declining below the pump and may be reported as dry or intermittently dry during pumping cycles. The major concern regarding groundwater and dry periods relates to water levels in shallow wells. As the water table drops, there is less available drawdown in shallow wells and some wells may 'go dry'.

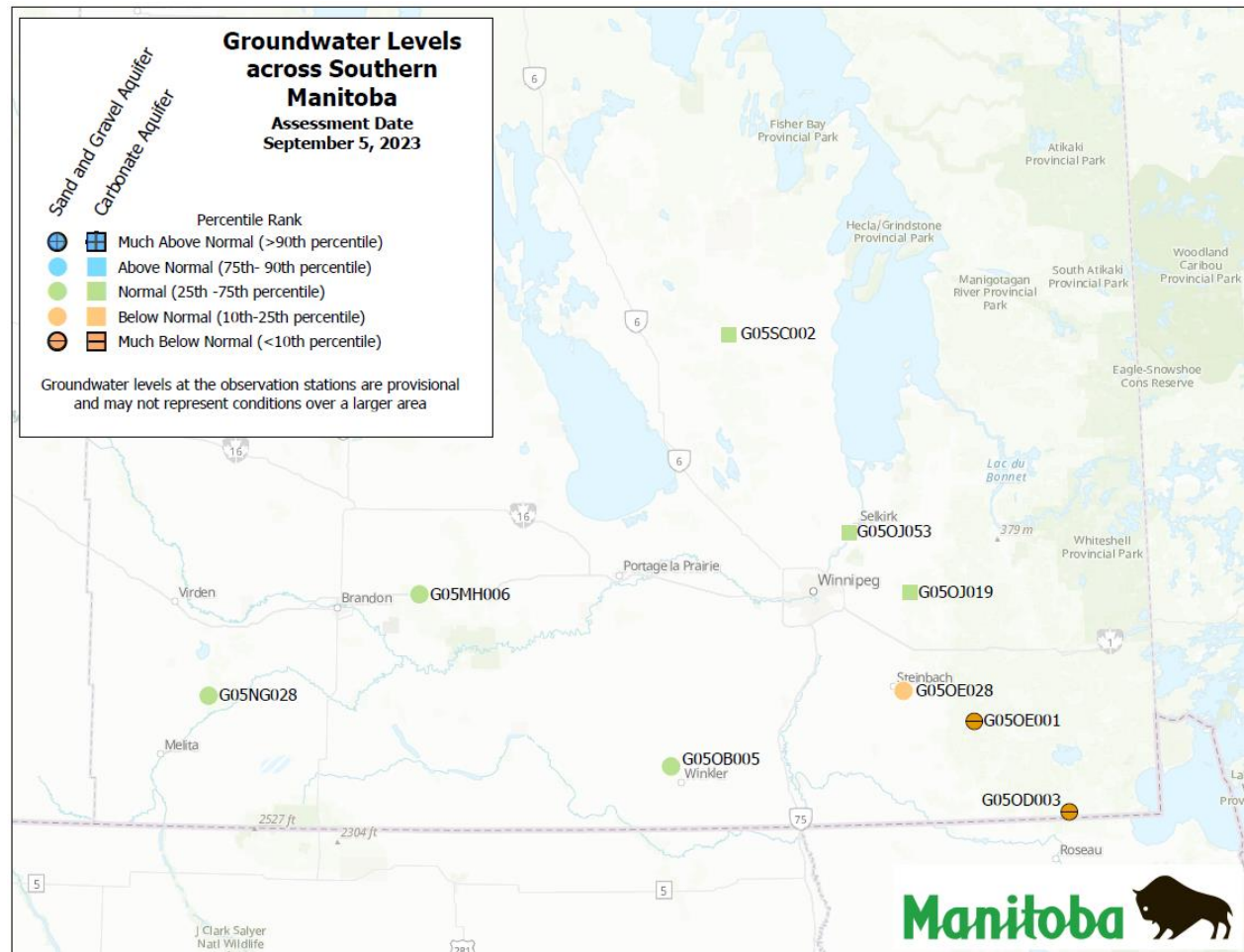


Figure 5: Groundwater indicator on September 5, 2023 for select groundwater monitoring sites.

Canada and United States Drought Monitors

The Canadian Drought Monitor and the United States Drought Monitor map the extent and intensity of drought conditions across Canada and the continental U.S.A.

Drought Monitor assessments are based on a suite of drought indicators, impacts data and local reports as interpreted by federal, provincial/state and academic scientists.

The Canadian and United States Drought Monitor maps use the following classification system:

- D0 (Abnormally Dry) – represents an event that occurs every 3 to 5 years;
- D1 (Moderate Drought) – 5 to 10 year event;
- D2 (Severe Drought) – 10 to 20 year event;
- D3 (Extreme Drought) – 20 to 50 year event; and
- D4 (Exceptional Drought) – 50+ year event.

Additionally, the map indicates the duration of drought as either short-term (S; less than 6 months) or long-term (L; more than 6 months) (Figure 6).

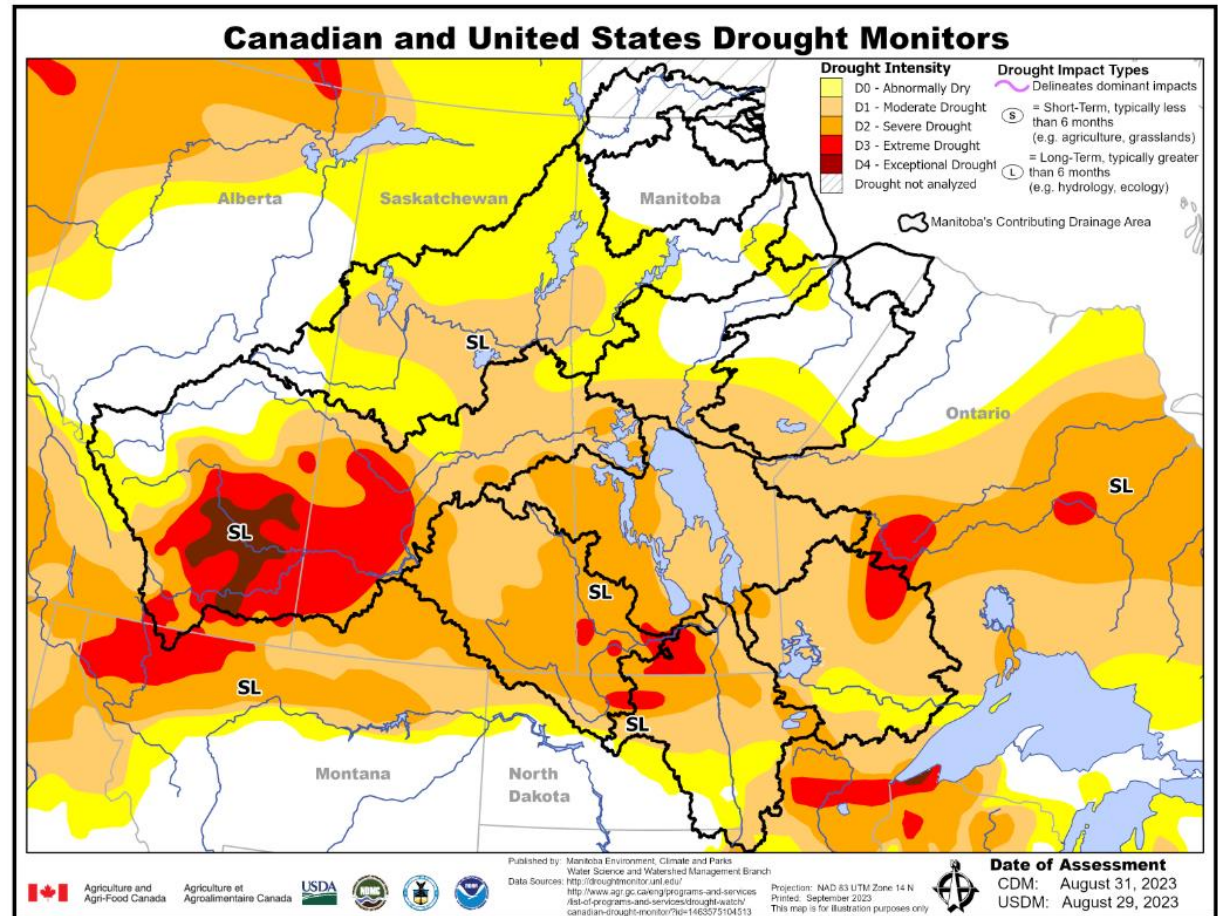


Figure 6: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of August 31, 2023.

Water Availability

Reservoir Conditions

Table 1: Water Supply Reservoir Levels and Storages – September 4, 2023 (Southern and Western Manitoba).

Water Supply Reservoir Levels and Storages								
Lake or Reservoir	Community Supplied	Target Level (feet)	Latest Observed Level (feet)	Observed date	Supply Status (Recent - Target) (feet)	Storage at Target Level (acre-feet)	Storage at Observed Level (acre-feet)	Supply Status (observed storage/target storage) (%)
Lake of the Prairies (Shellmouth)* ¹	Brandon, Portage, Cartier Regional Water Co-op	1,402.5	1401.94	September 4, 2023	-0.56	300,000	293,104	98%
Lake Wahtopanah (Rivers)*	Rivers	1,536	1535.27	September 4, 2023	-0.73	24,500	23,694	97%
Minnewasta (Morden)*	Morden	1,082	1079.16	September 4, 2023	-2.84	3,150	2,699	86%
Stephenfield*	Carman, Pembina Valley Water Co-op	972	968.02	September 4, 2023	-3.98	3,810	2,247	59%
Vermilion*	Dauphin	1,274	1274.09	September 4, 2023	+0.09	2,600	2,621	101%
Goudney (Pilot Mound)*		1,482	1482.06	September 4, 2023	+0.06	450	453	101%
Jackson Lake*		1,174	1170.63	September 4, 2023	-3.37	2,990	2,166	72%
Manitou (Mary Jane)*		1,537	1536.05	September 4, 2023	-0.95	1,150	1,065	93%
Turtlehead (Deloraine)*	Deloraine	1,772	1770.91	September 4, 2023	-1.09	1,400	1,345	96%
Lake Irwin*		1,178	1176.49	September 4, 2023	-1.51	3,800	2,997	79%
Minnedosa*		1,682	1680.92	September 4, 2023	-1.08	1,688	1,404	83%
Boissevain*	Boissevain	1,697	1697.30	September 4, 2023	+0.30	505	530	105%
Elgin*		1,532	1530.83	September 4, 2023	-1.17	520	439	84%
St. Malo*		840	839.98	September 4, 2023	-0.02	1,770	1,766	100%
Kenton Reservoir		1,448	1447.32	September 4, 2023	-0.68	600	549	91%
Killarney Lake		1,615	1615.46	July 18, 2023	+0.46	7,360	7,574	103%

¹ Summer target level and storage

* Real-time water level gauge

On Farm Water Supplies

Manitoba Agriculture's Crop Report Issue 17 (September 5, 2023) reported that across agri-Manitoba, water levels in dugouts were classified as low. This is of particular concern on pastures located in areas that have consistently missed summer rainfall events.

Soil Moisture

A regional representation of soil moisture conditions for the top 120 cm relative to the field capacity is shown on Figure 7 for September 4, 2023.

The colours on the map represent measured soil moisture values from automated instruments at sites across Manitoba. Qualitative range (very dry to very wet) is based on the amount of current soil moisture relative to field capacity. Field Capacity is defined as the maximum amount of moisture the soil can hold when drainage due to gravity stops.

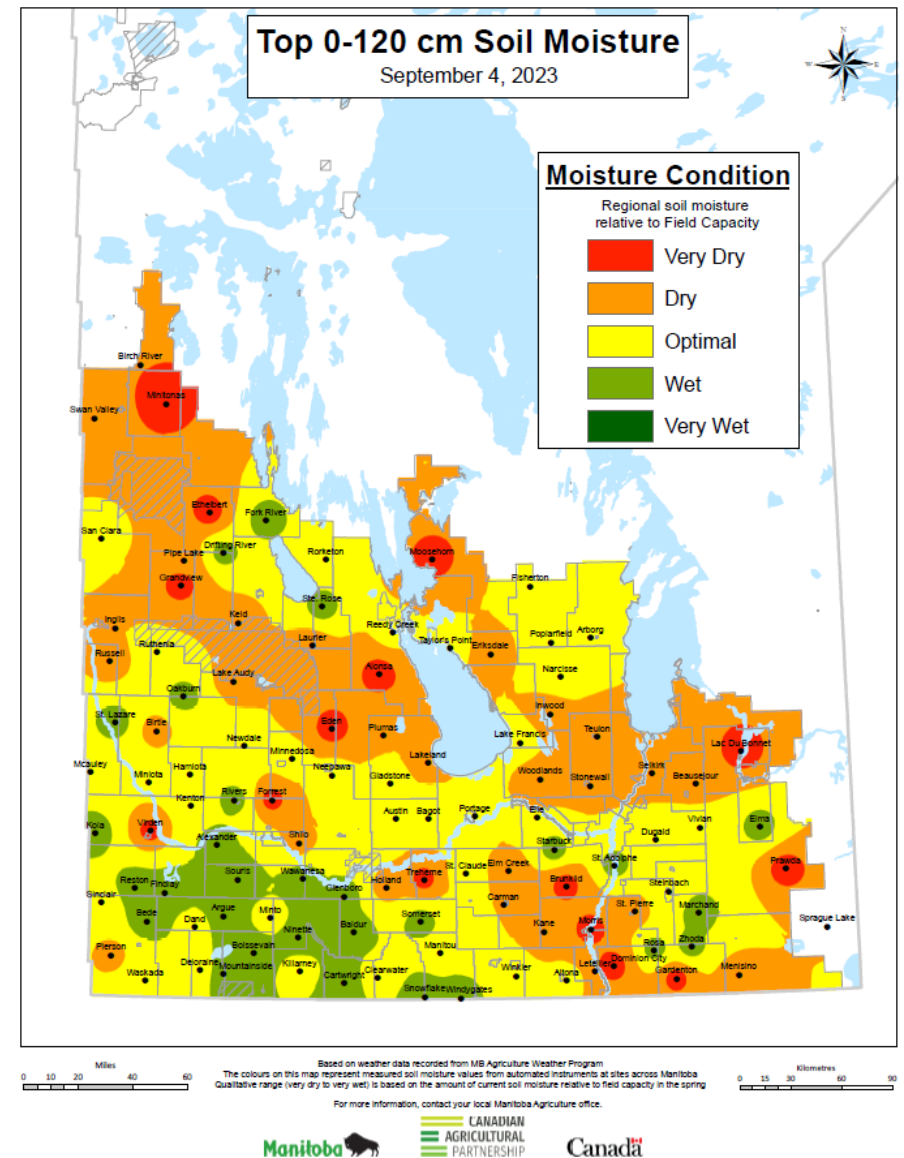


Figure 7: Manitoba Agriculture's September 4, 2023 mapping of soil moisture conditions in the top 0 – 120 cm.

Wildland Fires

As of September 4, 2023, 281 fires burned a total of 188,802 hectares, primarily in the western and northern regions. The number of wildfires for this time of year is lower than average. Wildfire danger was classified as low to moderate across most of Manitoba (Figure 8).

As of September 6, 2023, there were no provincial fire or travel restrictions in place. Eleven communities or municipalities had burning restrictions implemented.

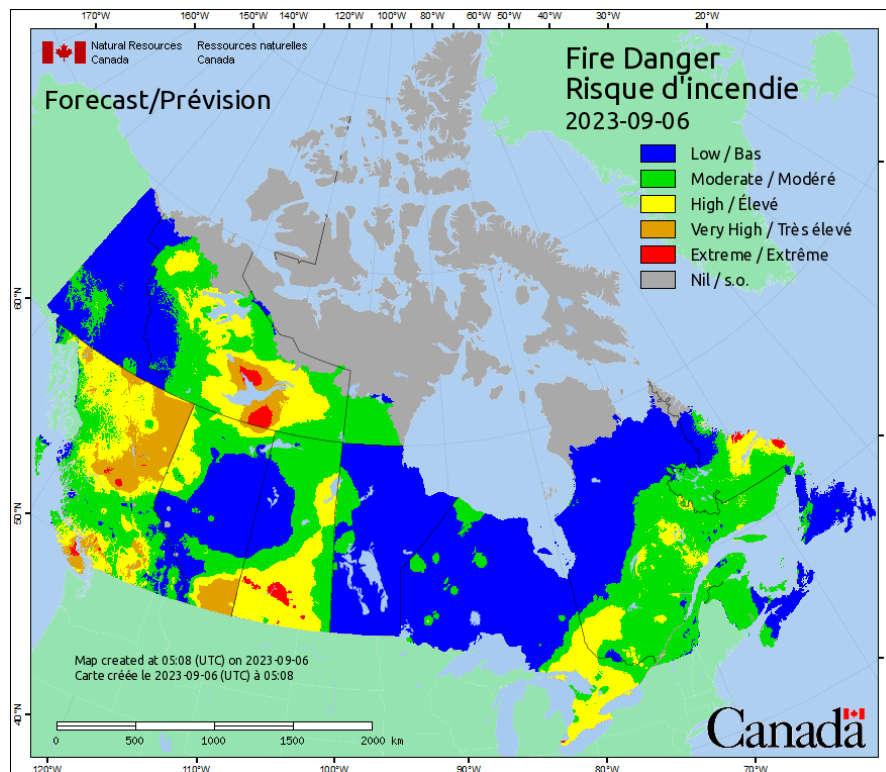


Figure 8: Fire Danger mapping by Natural Resources Canada.

Impacts due to Dry Conditions

Crops

Rainfall amounts continued to be highly variable throughout agri-Manitoba during August 2023. Harvest progress is at 37 % complete as of September 5, 2023. Overall, crop conditions were generally classified as fair to mostly good. Crop yields and quality are variable due to the overall dry conditions and the occurrence of timely rains in some areas. For specific information on yields, please refer to [Manitoba Agriculture's Crop Reports](#).

Forages

Grass conditions on pasture are variable and highly dependent on moisture levels, grazing management strategy, and soil type. Some producers are supplementing hay on pasture to ensure nutrient requirements of cattle are being met and to take pressure off the grass. A handful of producers are beginning to move cattle onto fenced hayfields to graze available regrowth. Pastures are holding on in most areas but producers will be looking to move cattle to fall grazing areas.

Water Supplies

Due to low levels along many rivers in August, some irrigators have had to temporarily reduce or cease pumping to allow water supplies for domestic, agricultural (livestock), and municipal users to replenish and/or to maintain minimum environmental flows. Provincial water control structures are being operated to mitigate low water level conditions where possible.

Past reports, drought mapping and other information and resources are available on the [Manitoba Drought Monitor](#) website.

For further information, please contact:

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Acknowledgements

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Manitoba Transportation and Infrastructure:

Reservoir level information:

<https://www.gov.mb.ca/mit/floodinfo/index.html>

Manitoba Wildfire Service:

<https://www.gov.mb.ca/sd/fire/>

Manitoba Agriculture:

Crop Reports:

<http://www.gov.mb.ca/agriculture/crops/seasonal-reports/crop-report-archive/index.html>

Topsoil moisture conditions:

<https://www.gov.mb.ca/agriculture/weather/weather-conditions-and-reports.html>

Environment and Climate Change Canada:

Flow and lake level information:

http://www.wateroffice.ec.gc.ca/index_e.html

Agriculture and Agri-Food Canada:

Canadian Drought Monitor:

<https://agriculture.canada.ca/en/agriculture-and-environment/drought-watch-and-agroclimate/canadian-drought-monitor>

United States Drought Monitor:

<https://droughtmonitor.unl.edu/>