

Water Availability and Drought Conditions Report

JULY 2023

Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for July 2023.
- Precipitation conditions over the past month, three month, and twelve month periods are as follows:
 - Similar to June 2023, July brought highly variable precipitation conditions to Manitoba. In agri-Manitoba, the eastern region was normal (85 – 115 % of median) to above normal (>115 %), while the remainder of agri-Manitoba experienced severely (40 – 60 %) to extremely dry (<40 %) conditions. In northern Manitoba, conditions were generally normal to above normal with some regions of moderate (60 – 85 %) dryness in the southeast and northwest.
 - Over the past three months (May, June, July), agri-Manitoba experienced mostly moderately to severely dry conditions except for an area of extremely dry conditions in the central region. 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, conditions ranged from moderately to severely dry in the south giving way to more normal conditions in the north.
- As of July 30, 2023, flows and levels in many rivers and lakes dropped into the below normal (10th – 25th percentile) or much below normal (<10th percentile) categories, predominately within southern Manitoba.
- As of July 28, 2023, most monitored aquifer levels remained in the normal range (25th – 75th percentile), except for two of the sand and gravel aquifers in southeastern Manitoba that were classified as much below normal (<10th percentile).
- The July 31, 2023 Canadian Drought Monitor assessment showed a removal or downgrading of drought conditions in northern Manitoba, but an increase in the extent of moderate drought (D1) and severe drought (D2) conditions across agri-Manitoba, particularly in the northwest region.
- As of June 30, 2023, provincial water supply reservoirs were generally close to or above full supply, except Stephenfield Reservoir which was at 67 % 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. The Interlake and central regions reported that supplies were generally adequate. However, in other regions, dugout water levels were reported as low and could become a significant concern in the near future.
- As of August 3, 2023, a total of 103,548 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, six 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.

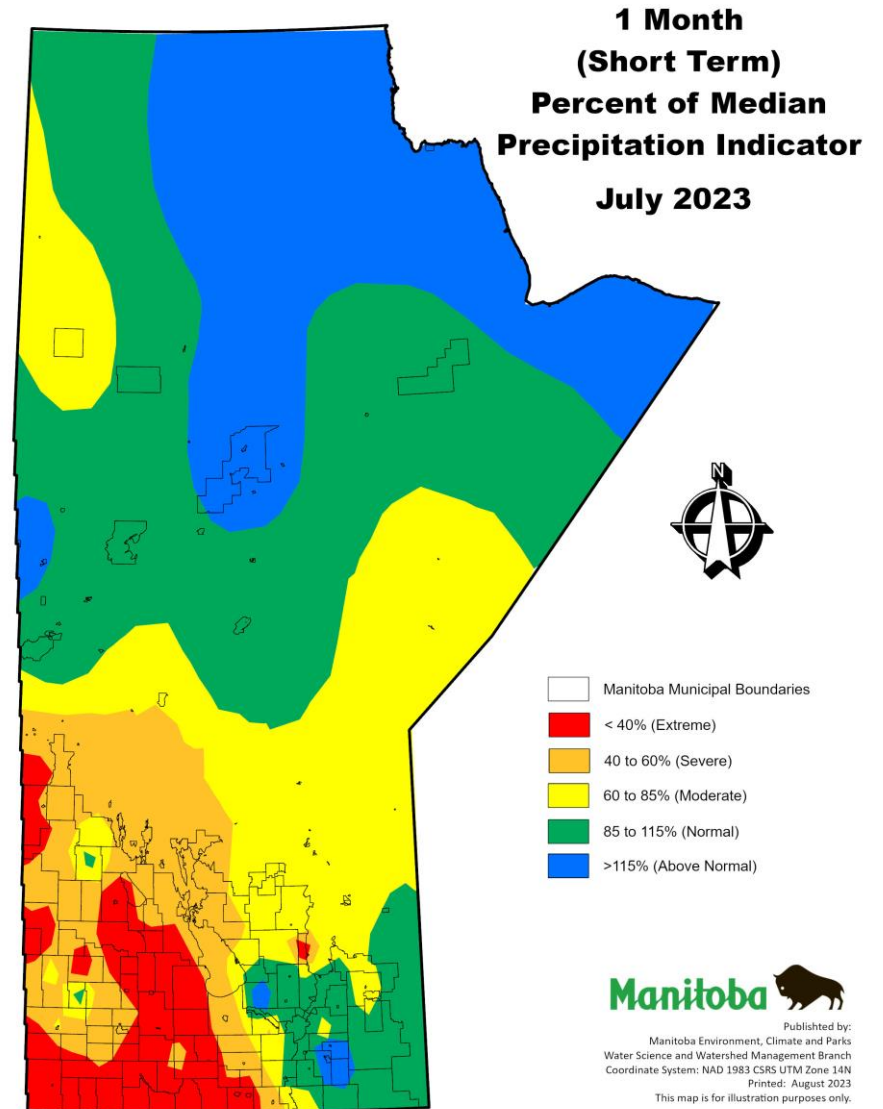


Figure 1: One month (short term) per cent of median precipitation indicator.

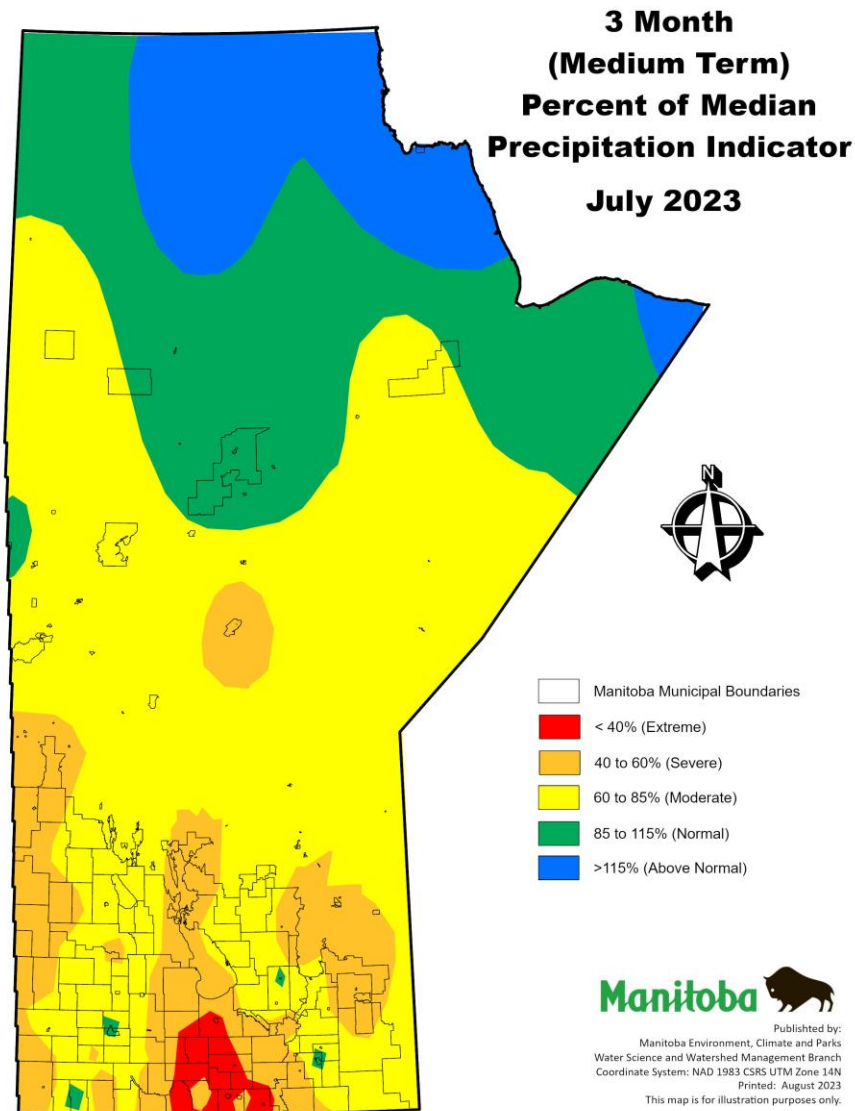


Figure 2: Three month (medium term) per cent of median precipitation indicator.

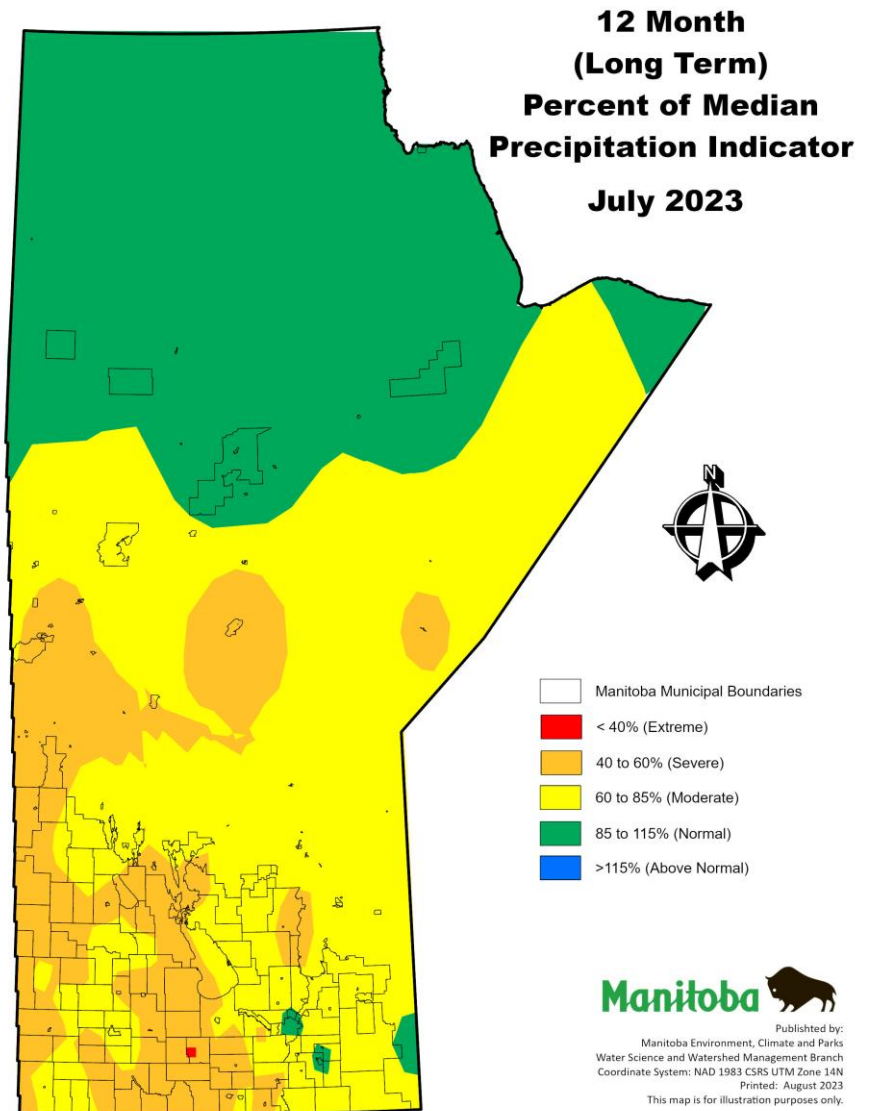


Figure 3: Twelve month (long term) per cent of median precipitation indicator.

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 July 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.

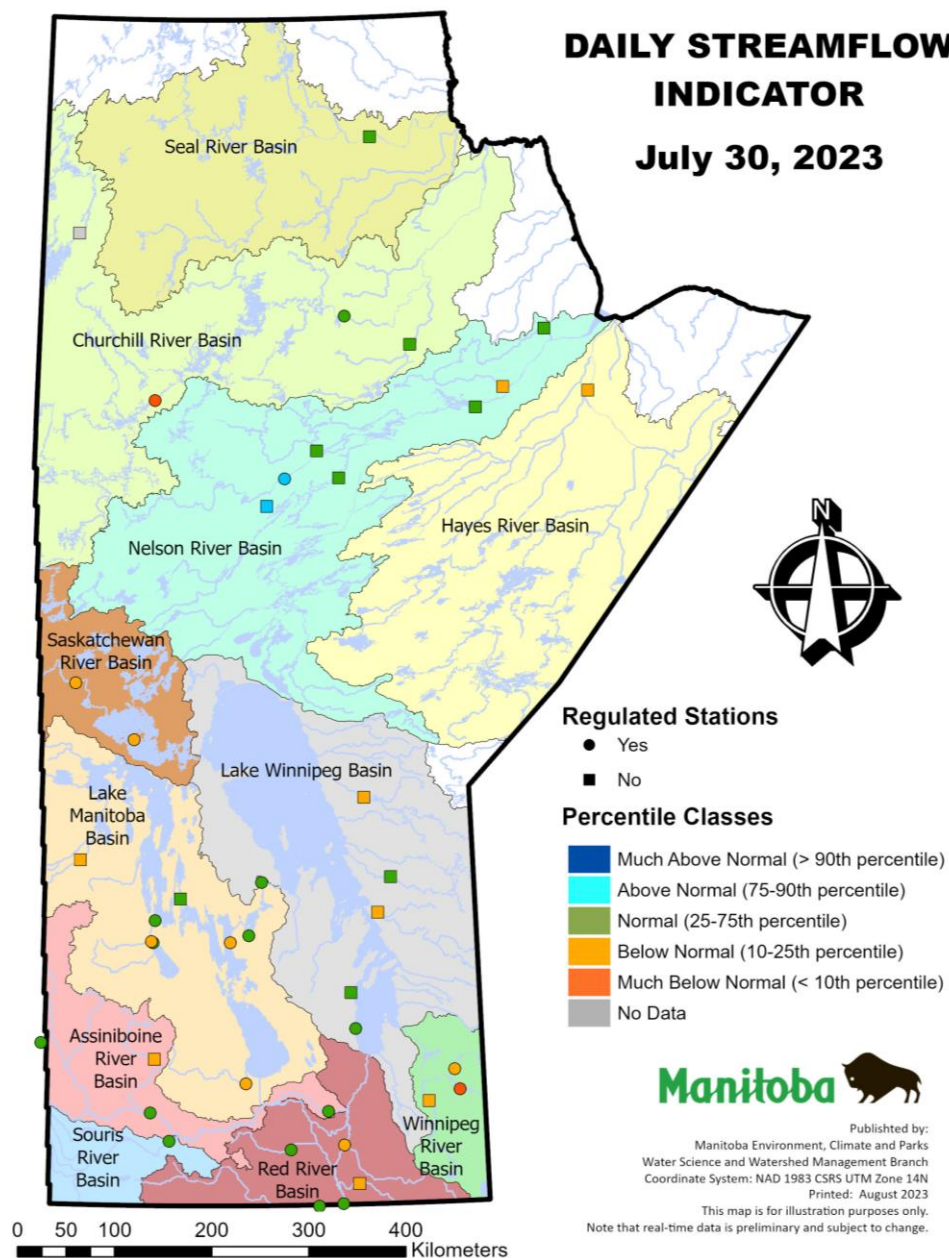


Figure 4: Daily streamflow and lake level indicator for July 30, 2023.

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'.

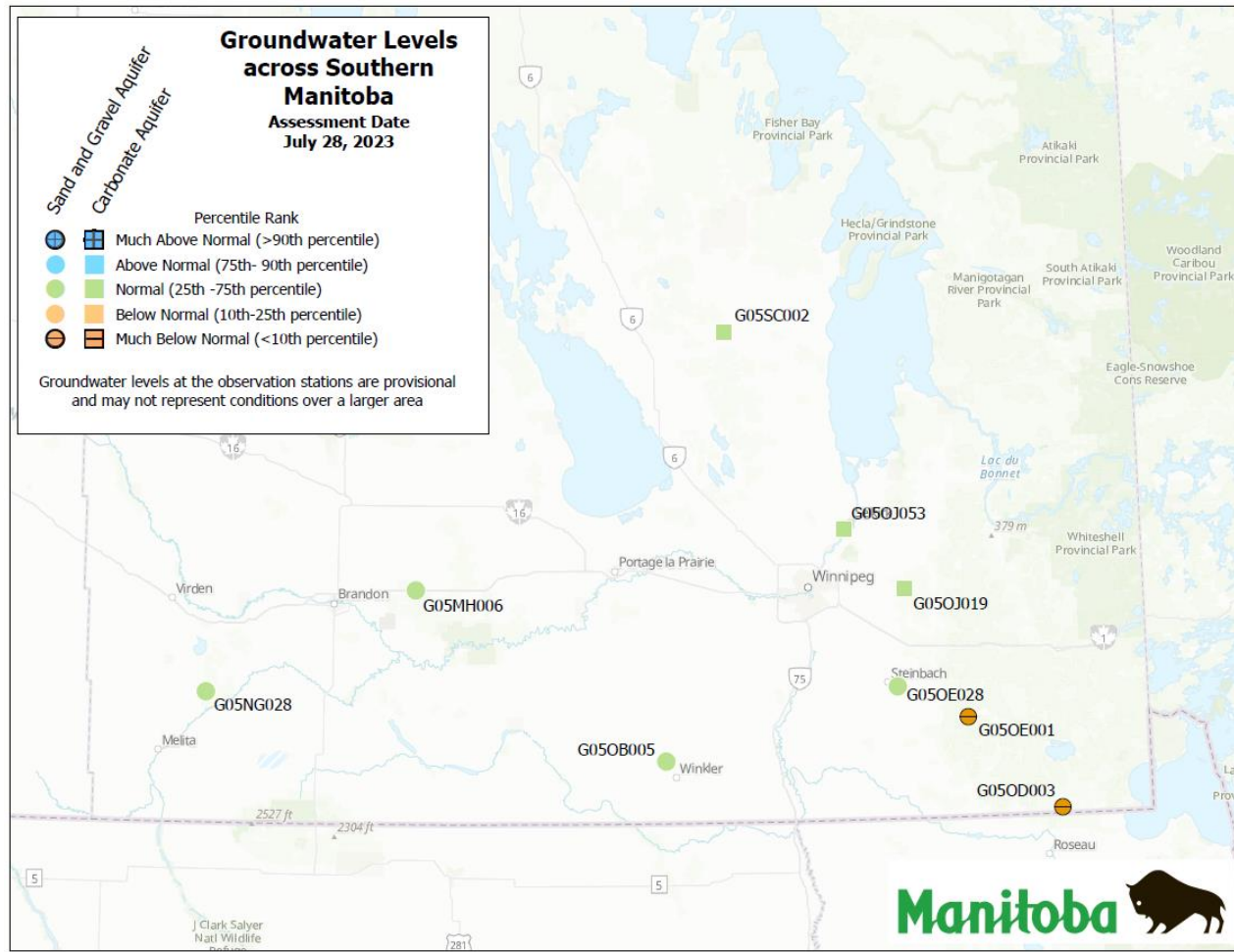


Figure 5: Groundwater indicator on July 28, 2023 for select groundwater monitoring sites.

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).

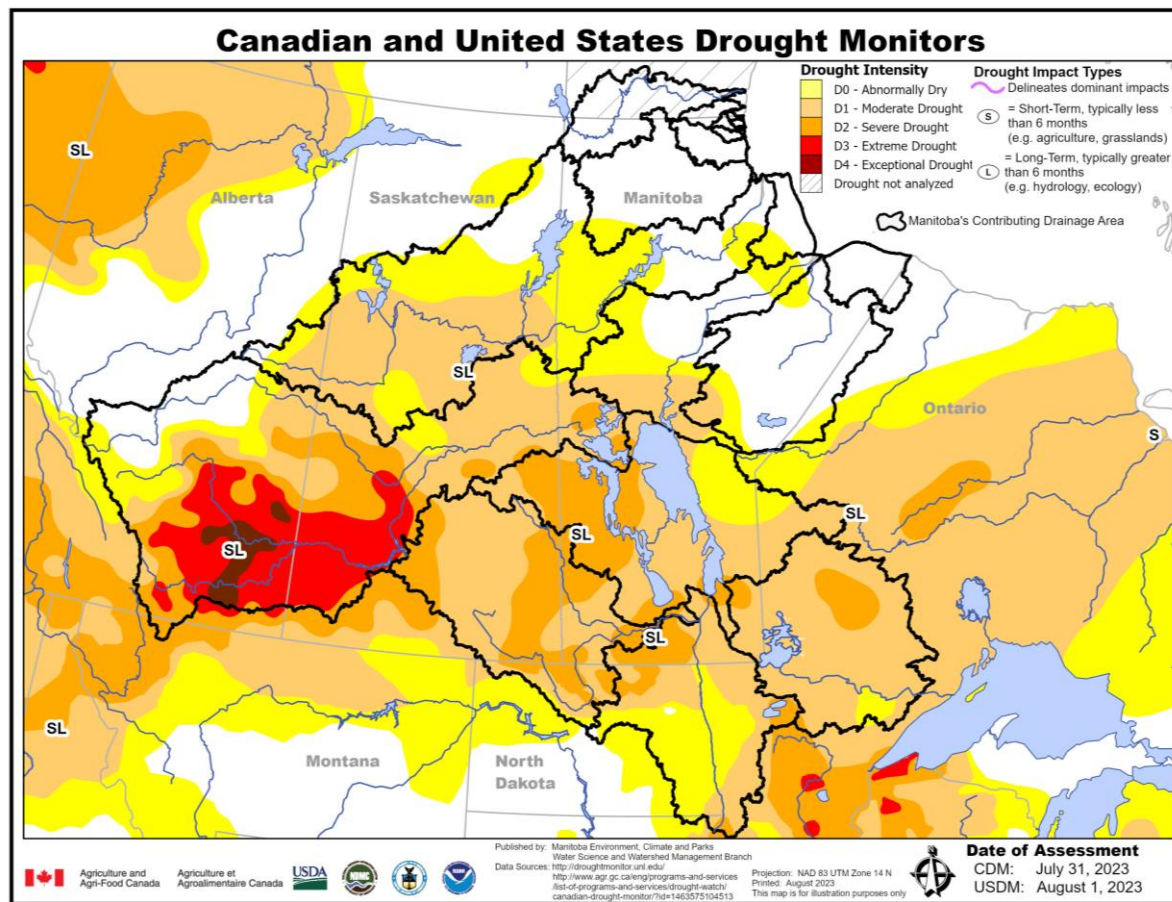


Figure 6: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of July 31, 2023.

Water Availability

Reservoir Conditions

Table 1: Water Supply Reservoir Levels and Storages – July 31, 2023 (Southern and Western Manitoba).

Water Supply Reservoir Levels and Storages - July 31, 2023								
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	1402.25	July 31, 2023	-0.25	300,000	296,908	99%
Lake Wahtopanah (Rivers)*	Rivers	1,536	1536.10	July 31, 2023	+0.10	24,500	24,729	101%
Minnewasta (Morden)*	Morden	1,082	1082.87	July 31, 2023	+0.87	3,150	3,290	104%
Stephenfield*	Carman, Pembina Valley Water Co-op	972	968.76	July 31, 2023	-3.24	3,810	2,543	67%
Vermilion*	Dauphin	1,274	1274.08	July 31, 2023	+0.08	2,600	2,618	101%
Goudney (Pilot Mound)*		1,482	1482.50	July 31, 2023	+0.50	450	475	106%
Jackson Lake*		1,174	1171.35	July 31, 2023	-2.65	2,990	2,335	78%
Manitou (Mary Jane)*		1,537	1536.38	July 31, 2023	-0.62	1,150	1,094	95%
Turtlehead (Deloraine)*	Deloraine	1,772	1772.03	July 31, 2023	+0.03	1,400	1,403	100%
Lake Irwin*		1,178	1177.32	July 31, 2023	-0.68	3,800	3,395	89%
Minnedosa*		1,682	1682.23	July 31, 2023	+0.23	1,688	1,748	104%
Boissevain*	Boissevain	1,697	1697.88	July 31, 2023	+0.88	505	578	114%
Elgin*		1,532	1531.24	July 31, 2023	-0.76	520	467	90%
St. Malo*		840	840.15	July 31, 2023	+0.15	1,770	1,795	101%
Kenton Reservoir		1,448	1447.47	July 31, 2023	-0.53	600	560	93%
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 12 (August 1, 2023) summarized on farm water supply availability as follows:

Region	General Dugout Condition
Eastern	-
Interlake	Most dugout levels are classified as sufficient
Southwest	Dugouts are 45 % full
Central	Most dugout levels are classified as sufficient
Northwest	-

Crop report Issue 11 (July 25, 2023) reported that generally, water levels in dugouts were low and that water supply may become a concern in the near future.

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 July 30, 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.

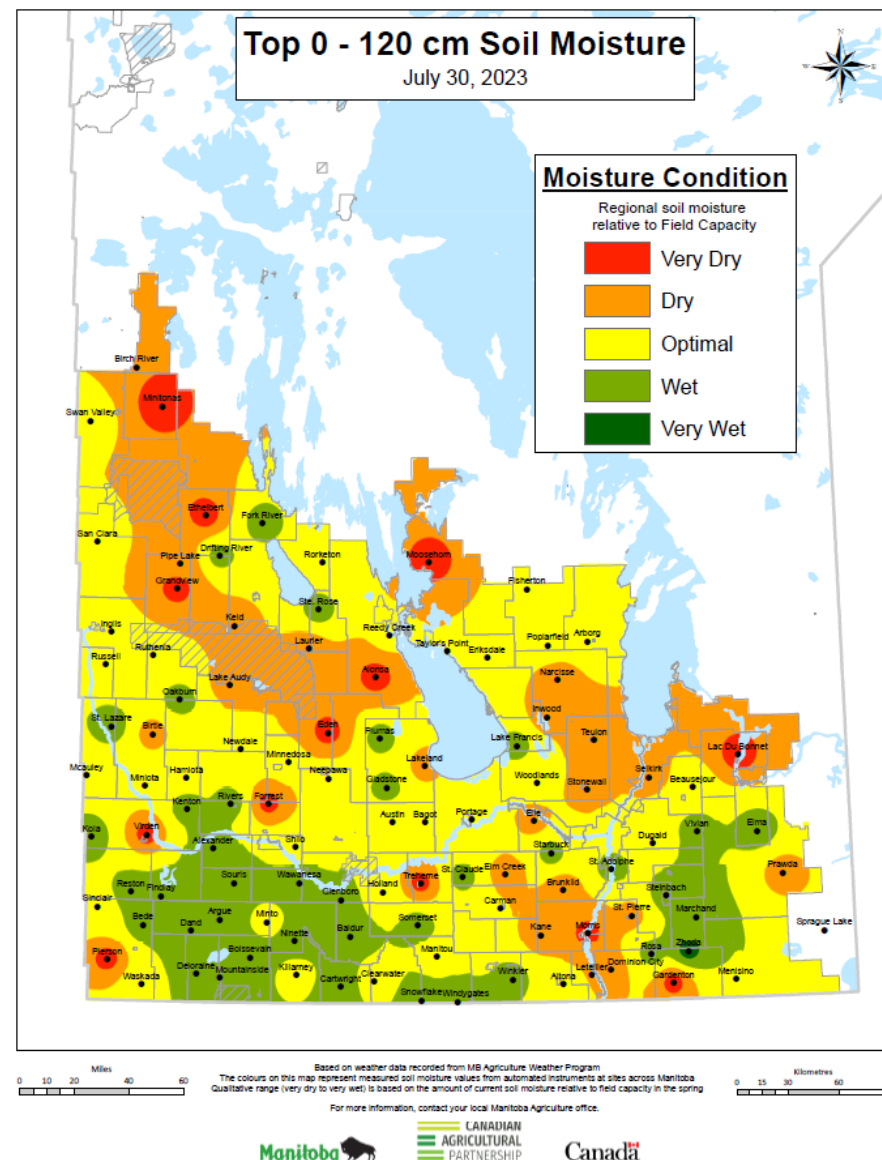


Figure 7: Manitoba Agriculture's July 30, 2023 mapping of soil moisture conditions in the top 0 – 120 cm.

Wildland Fires

As of August 3, 2023, 243 fires burned a total of 103,548 hectares, primarily in the western and northern regions. The number of wildfires for this time of year is lower than average. Except for the southwest corner which was classified as high, wildfire danger was classified as moderate to low across most of Manitoba (Figure 8).

As of August 3, 2023, there were no provincial fire or travel restrictions in place. Six communities or municipalities had burning restrictions implemented.

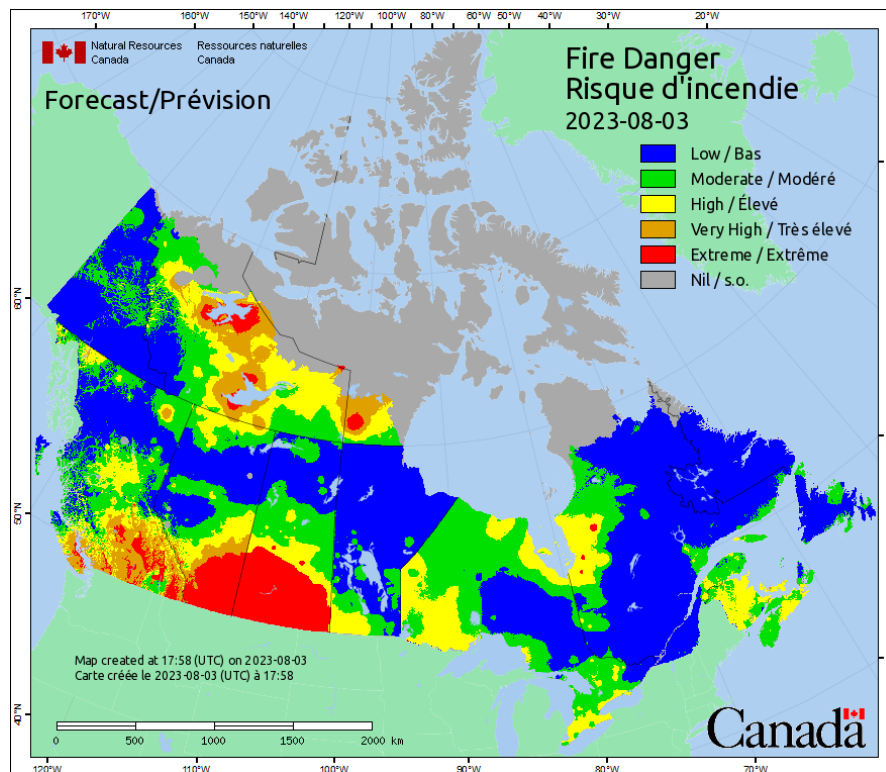


Figure 8: Fire Danger mapping by Natural Resources Canada.

Impacts due to Dry Conditions

Crops

Rainfall amounts continue to be highly variable throughout agri-Manitoba during the 2023 growing season and rain is needed. Overall, crop conditions were generally classified as fair to good. There are reports of crops showing drought stress, including canola and soybeans, particularly in the southwest, northwest and central regions.

Forages

Hay yields remain highly variable and are dependent on moisture conditions, whereas greenfeed yields are better than expected. Second cut is now underway and in general, yields are reported as below average. In many areas there will likely not be a second cut unless rain occurs. Many of the hayfields and some pastures are going dormant. Pastures are classified as average to below average condition and are in need of moisture, particularly in the southwest and northwest regions. Dry conditions combined with forecasted high temperatures will further stress forages. Producers in some areas have been spraying pastures for grasshoppers.

Water Supplies

Due to low levels along many rivers, 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.

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

For further information, please contact:

Carly Delavau, Ph.D, P.Eng.
Water Supply Engineer, Surface Water Management Section,
Water Science and Watershed Management Branch,
Manitoba Environment and Climate
Box 14, 14 Fultz Blvd., Winnipeg, Manitoba, R3Y 0L6
Ph. (204) 806-4557, Fax (204) 945-7419
E-mail: Carly.Delavau@gov.mb.ca

Acknowledgements

This report was prepared with information from the following sources which are gratefully acknowledged:

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/>