

Water Availability and Drought Conditions Report

JUNE 2021

Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for June 2021. Although the June 9 – 11 rainfall event helped improve conditions in some regions, as of June 30, 2021, conditions remain dry across southern Manitoba with varied impacts occurring, primarily to the agricultural sector.
- For more information on conditions, indicators, and resources for those impacted by dry conditions, please visit the Manitoba Drought Monitor at www.manitoba.ca/drought
- Precipitation conditions over the past month, three month, and twelve month periods are as follows:
 - During June, the Interlake, eastern region and parts of the central region experienced moderately (60 – 85 % of median) to severely (40 – 60 %) dry conditions while the remainder of agri-Manitoba received normal (85 – 115 %) to above normal (> 115 %) precipitation. In northern Manitoba, conditions were normal to above normal.
 - Over the past three months (April, May, June), most of southern Manitoba experienced moderately to severely dry conditions. Conditions in northern Manitoba were normal to above normal.
 - Over the past 12 months, most of southern Manitoba experienced moderately to severely dry conditions. Conditions in northern Manitoba were normal to above normal.
- As of June 28, 2021, many rivers and lakes across southern Manitoba were showing below normal (10th – 25th percentile) to much below normal (< 10th percentile) conditions.
- Groundwater levels continue to decline in all index wells with the exception of Oak Lake which responded favorably to mid-June rainfall. Five locations are in the normal range (25th – 75th percentile) and five wells, mostly in the carbonate aquifer, are much below normal (< 10th percentile). The groundwater level at Poplarfield, with over 50 years of monitoring, is setting a new recorded low for this time of the year. Most aquifers store large amounts of water; however, local conditions may vary from monitoring and shallow aquifers of limited extent may experience water levels declining below the pump and report as dry or intermittently dry during pumping cycles.
- The June 30, 2021 Canadian Drought Monitor assessment showed that exceptional drought conditions (D4) expanded since May 31, including regions between Brandon and Neepawa, along the United States border between Deloraine and Winkler, and across much of the Interlake. Most of the remainder of southern Manitoba is classified as extreme (D3) or severe (D2) drought conditions, giving way to abnormally dry (D0) conditions at the north end of Lake Winnipeg.
- Most provincial water supply reservoirs are at or close to full supply level, except for Lake Minnewasta. Some communities implemented water conservation restrictions (either voluntary or mandatory) including the City of Morden and the Pembina Valley Water Co-op. At the beginning of June, seasonal demand for water was very high, putting increased pressure on water treatment plants and distribution systems, including where raw water supplies were sufficient.
- Dugout water levels are generally classified as below normal and some are dry. There have been continued reports of well drilling and hauling water to supplement on-farm water supplies. Livestock producers can apply for funding to support water source development under

[Ag Action Manitoba](#). Additionally, the [Manitoba Hay Listing Service](#) is active; producers with extra feed or looking for feed are encouraged to list their available supplies for sale.

- High temperatures, strong winds, and lack of widespread rainfall has continued to stress Manitoba crops. Many crops are maturing faster than normal and moving into reproductive stages faster than expected due to drought stress. First-cut hay is underway, with reported yields ranging from 50 to 80 % of normal, though with high quality.
- As of June 28, 2021, the wildfire danger was moderate to extreme in the south and low to moderate in the north. Conservation and Climate's Wildfire Program reported 116 wildfires this year to date, burning a total area of 288,339 hectares.

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.

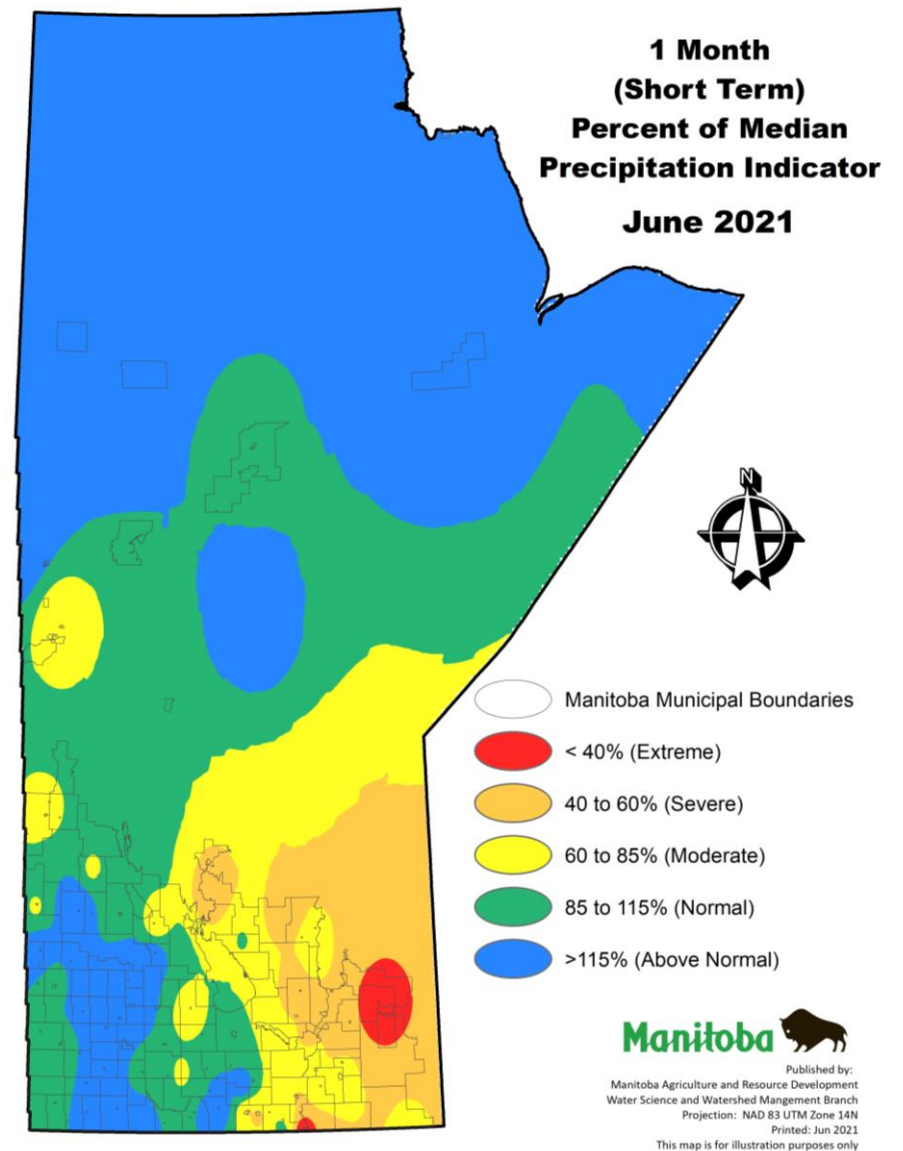


Figure 1: One month (short term) per cent of median precipitation indicator.

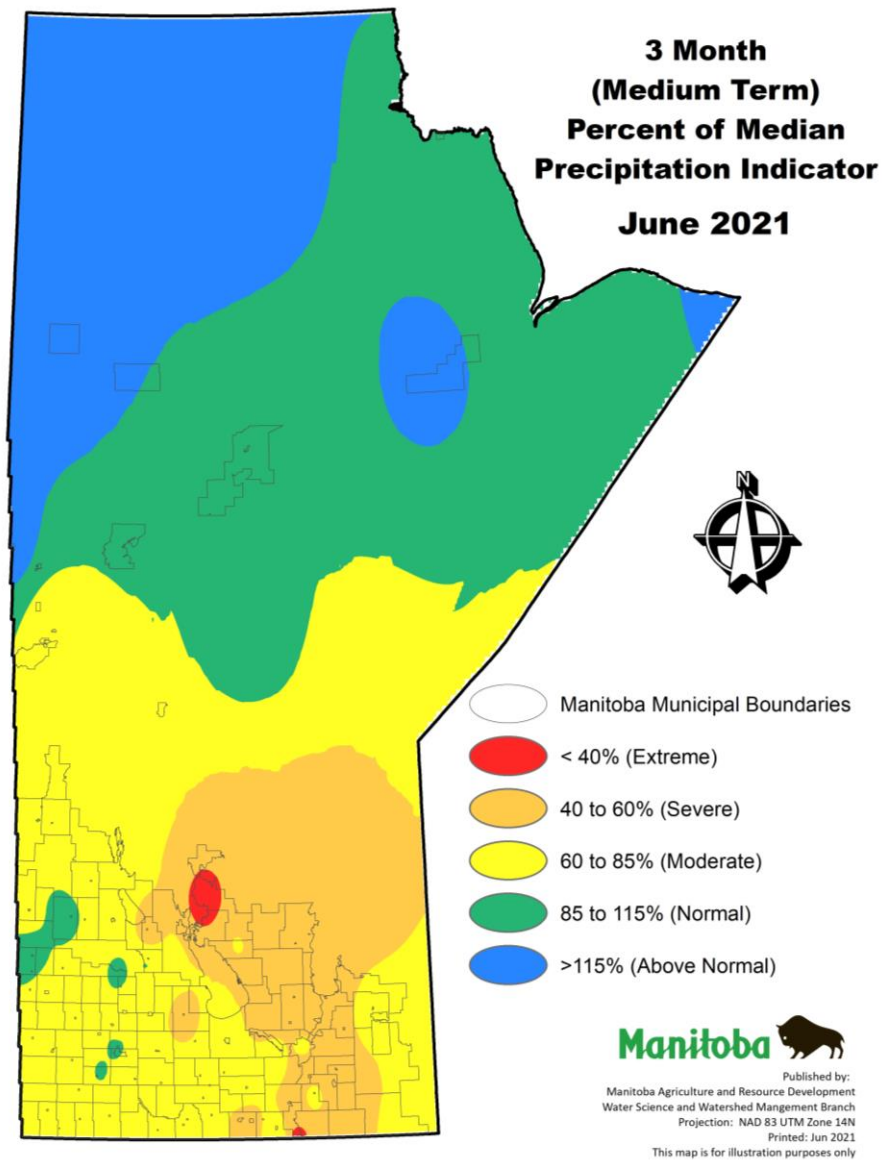


Figure 2: Three month (medium term) per cent of median precipitation indicator.

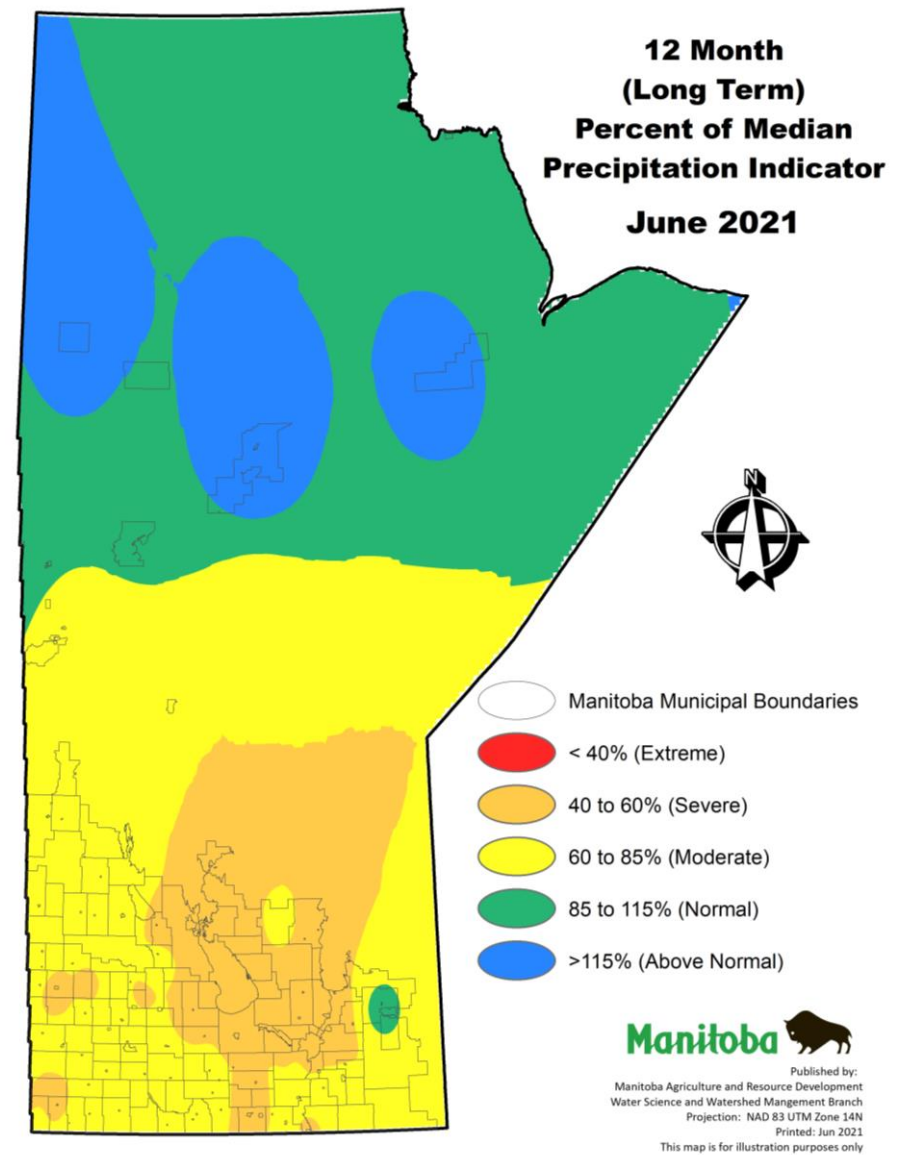


Figure 3: Twelve month (long term) per cent of median precipitation indicator.

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 June 29, 2021.

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.

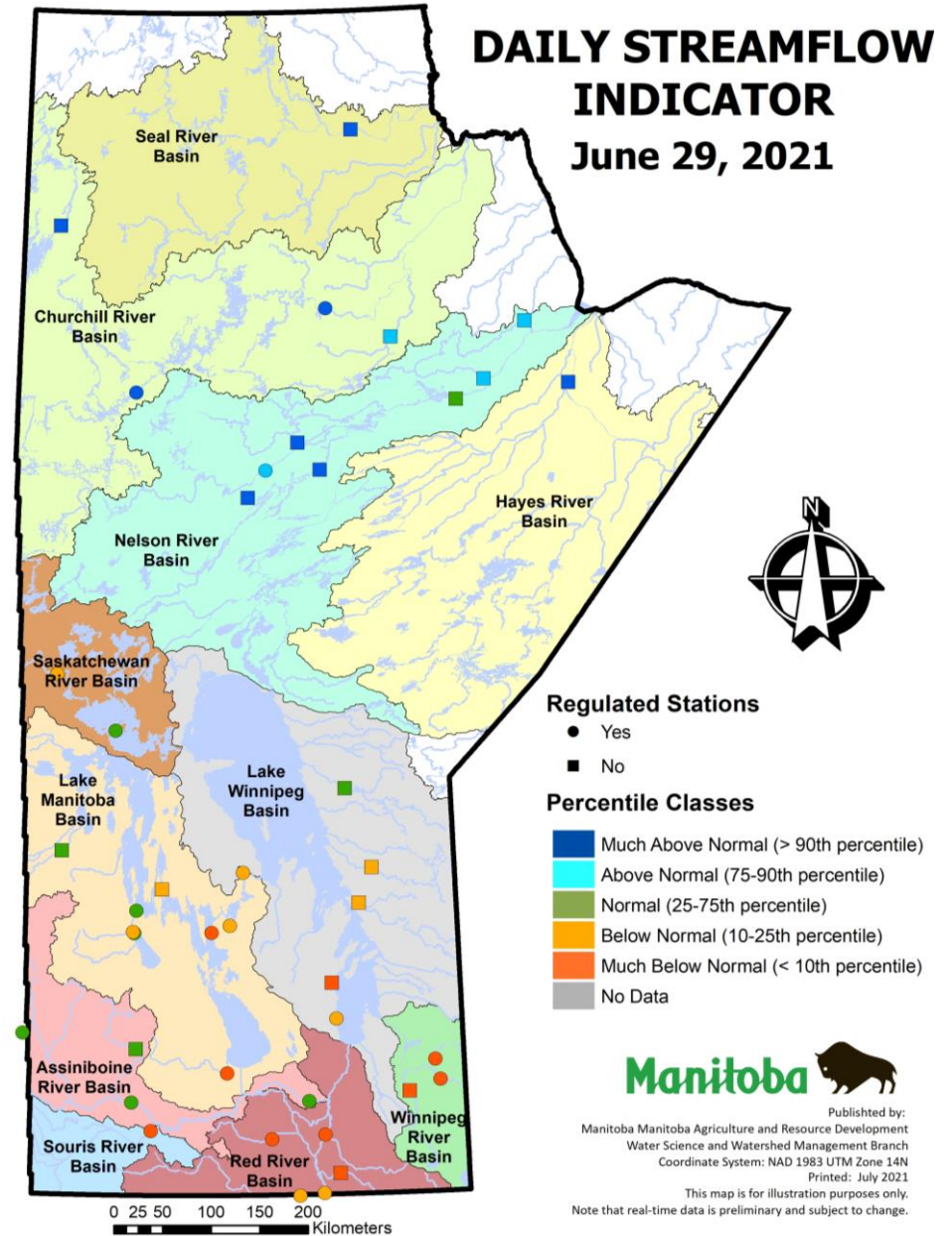


Figure 4: Daily streamflow and lake level indicator for June 29, 2021.

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. Most aquifers also store very large quantities of groundwater and can continue to provide water during extended periods of dry weather. Consequently, 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', even in short-term drought conditions.

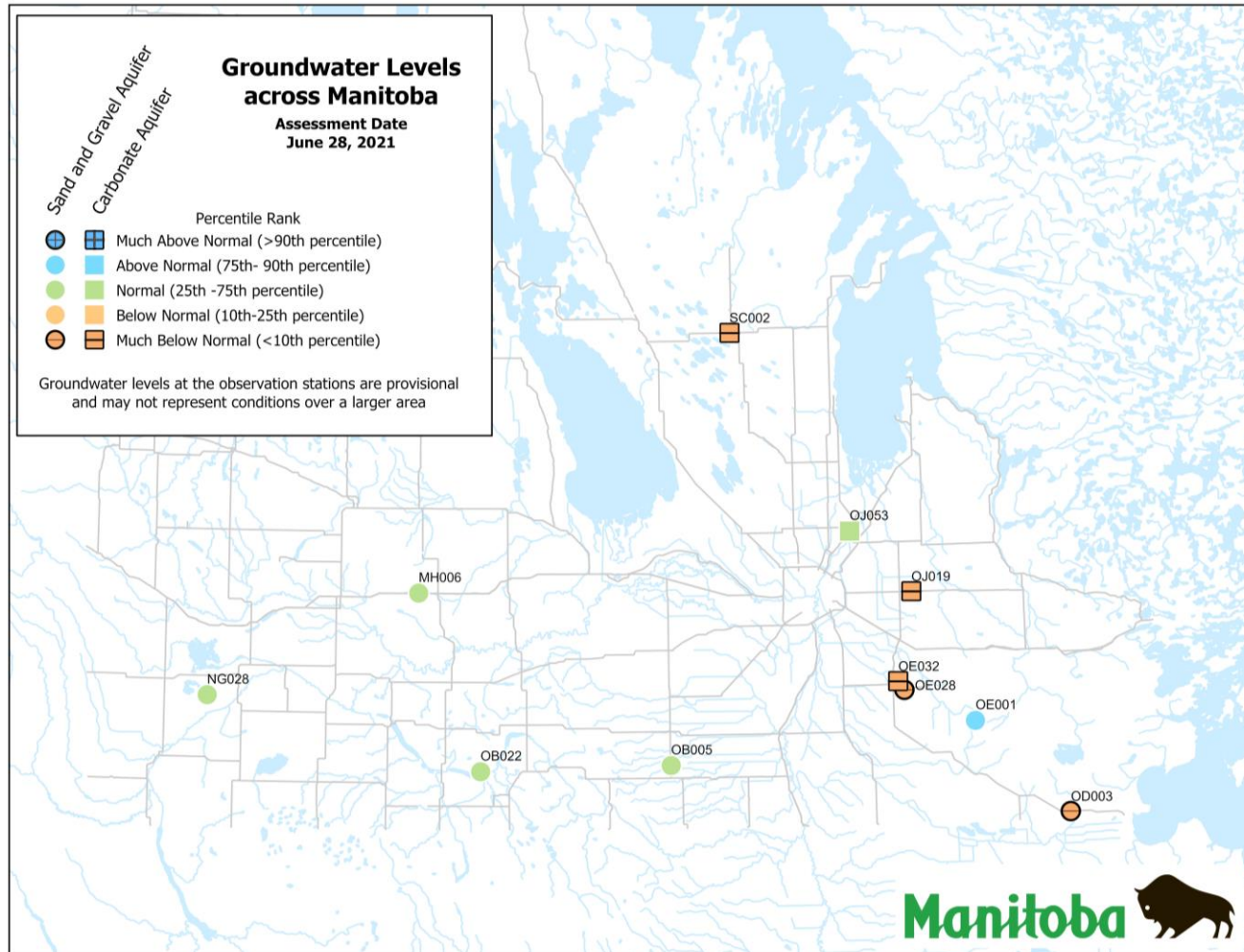


Figure 5: Groundwater indicator on June 28, 2021 for select groundwater monitoring sites.

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).

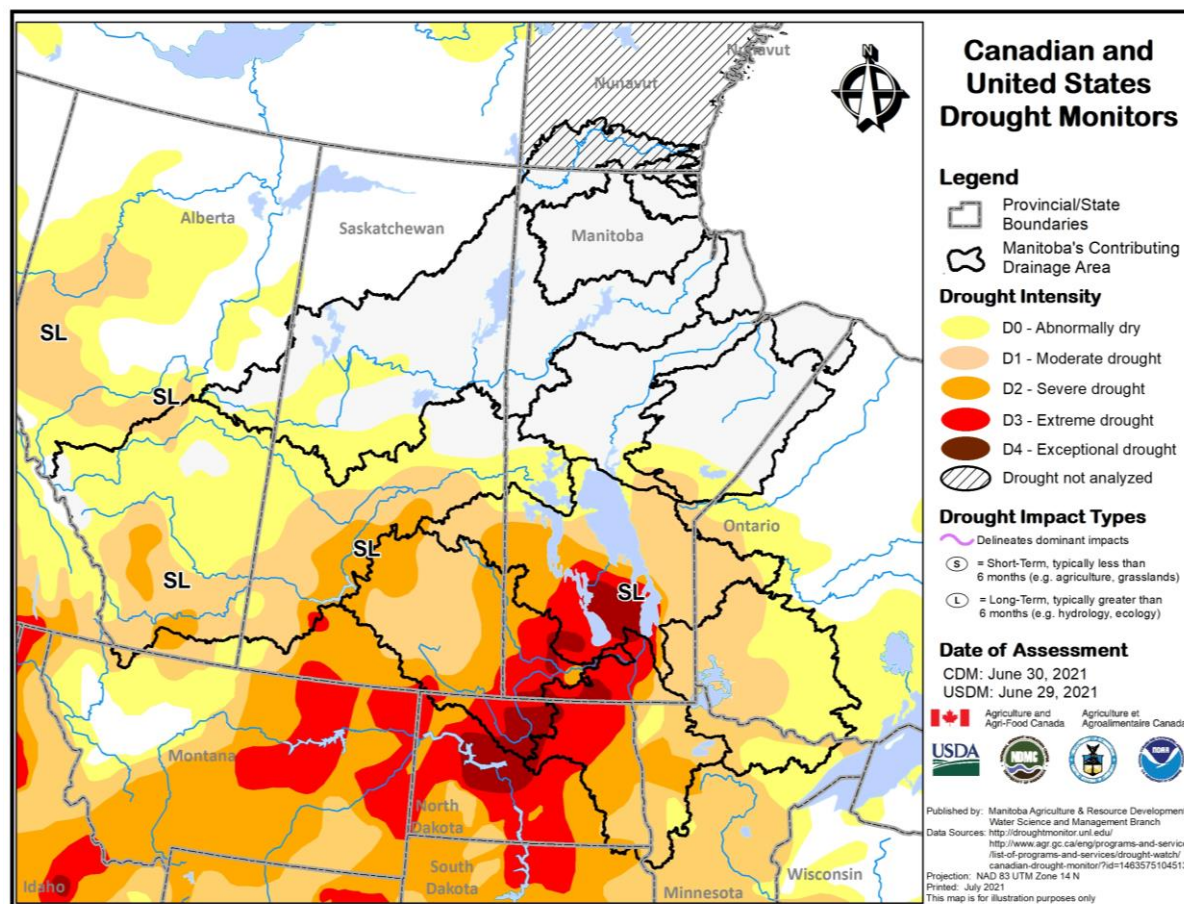


Figure 6: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of June 30, 2021.

Water Availability

Reservoir Conditions

Table 1: Water Supply Reservoir Levels and Storages – June 29, 2021 (Southern and Western Manitoba).

Lake or Reservoir	Community or Co-ops 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 ¹	1402.46	June 28, 2021	-0.04	300,000	299,463	100%
Lake Wahtopanah (Rivers)*	Rivers	1,536	1536.85	June 29, 2021	0.85	24,500	26,403	108%
Minnewasta (Morden)*	Morden	1,082	1075.28	June 29, 2021	-6.72	3,150	2,140	68%
Stephenfield*	Carman, Pembina Valley Water Co-op	972	972.03	June 29, 2021	0.03	3,810	3,826	100%
Vermilion*	Dauphin	1,274	1274.50	June 29, 2021	0.50	2,600	2,718	105%
Goudney (Pilot Mound)*		1,482	1482.20	June 29, 2021	0.20	450	460	102%
Jackson Lake*		1,174	1172.53	June 29, 2021	-1.47	2,990	2,622	88%
Manitou (Mary Jane)*		1,537	1537.26	June 29, 2021	0.26	1,150	1,158	101%
Turtlehead (Deloraine)*	Deloraine	1,772	1769.68	June 29, 2021	-2.32	1,400	1,258	90%
Lake Irwin*		1,178	1177.84	June 29, 2021	-0.16	3,800	3,707	98%
Minnedosa*		1,682	1682.89	June 29, 2021	0.89	1,688	1,933	114%
Kenton Reservoir		1,448	1447.09	May 19, 2021	-0.91	600	532	89%
Killarney Lake		1,615	1613.69	May 12, 2021	-1.31	7,360	6,756	92%
Elgin		1,532	1531.76	May 12, 2021	-0.24	520	503	97%
St. Malo		840	840.30	May 13, 2021	0.30	1,770	1,819	103%
Boissevain	Boissevain	1,697	1696.01	May 12, 2021	-0.99	505	434	86%

¹ Summer target level and storage;
 * Real-time water level gauge.

On Farm Water Supply

Farm water supply updates from Manitoba Agriculture and Resource Development's Crop Report Issue 10 (published June 29, 2021) are provided in Table 2.

Table 2: On Farm Water Supply (Dugout) Conditions.

Region	General Dugout Condition
Eastern	Livestock water availability is rated as adequate.
Interlake	Surface water is very limited in much of the northern Interlake; wells for livestock water are being drilled in the north Interlake, where dugouts in pastures have run dry.
Southwest	Dugouts are 50 to 70% full. In some areas, producers have started to haul water to supplement pasture water sources.
Central	Producers are interested in cleaning out existing dugouts, constructing new ones or drilling a new well to improve their water supplies.
Northwest	Water supplies are low.

Soil Moisture

Manitoba Agriculture and Resource Development's mapping shows the soil moisture conditions for the top 120 cm on July 4, 2021.

Soil moisture levels are rated as follows: < 20 % Very Dry, 20 – 40 % Dry; 40 – 70 % Optimal; 70 – 90 % Wet and >90 % Very Wet in relation to the soil saturation level (maximum recorded at that station).

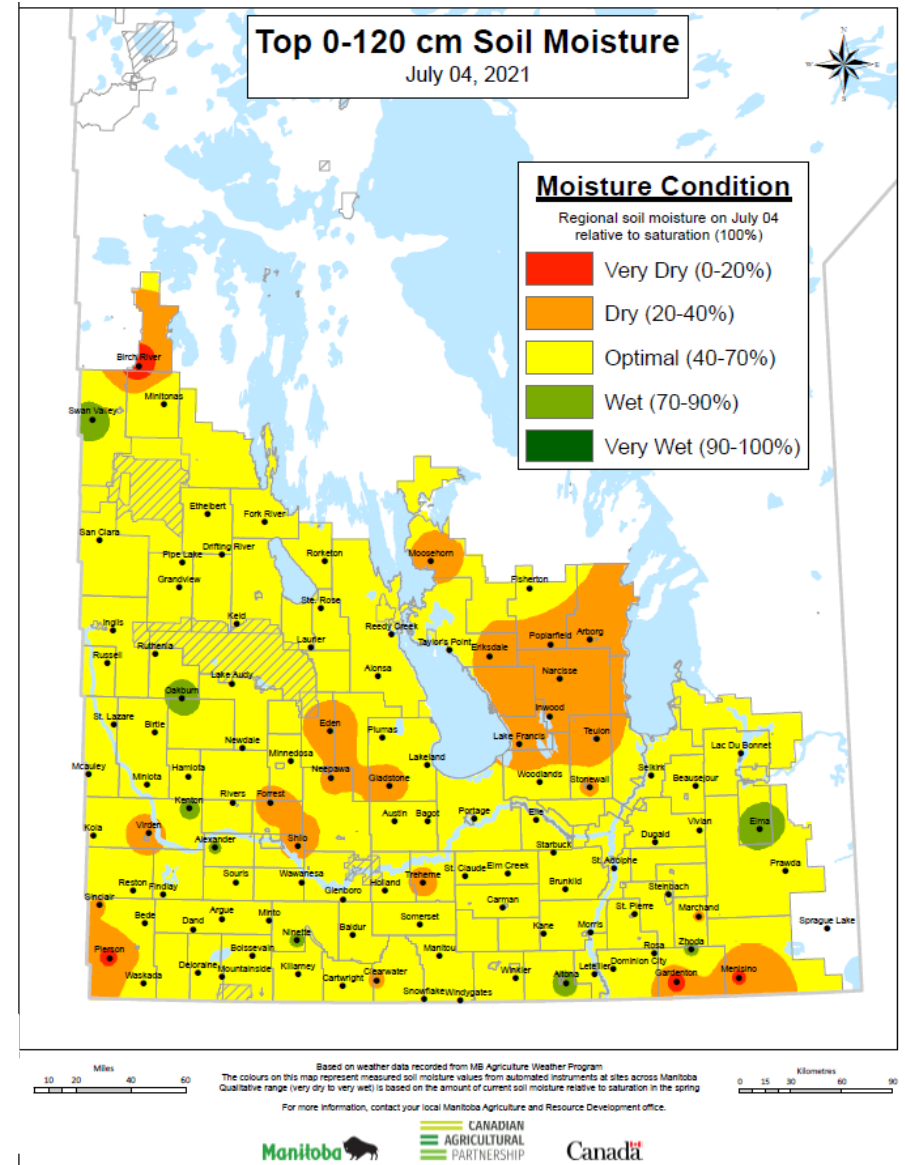


Figure 7: Manitoba Agriculture and Resource Development's July 4, 2021 mapping of soil moisture conditions in the top 0 – 120 cm.

Wildland Fires

As of June 28, 2021 Conservation and Climate's Wildfire Program reported 116 wildfires this year to date, burning a total area of 288,339 hectares. Most of the burned area occurred in the eastern region. The fire danger across south and central regions of Manitoba remains moderate to extreme, while danger levels in the north remain low to moderate.

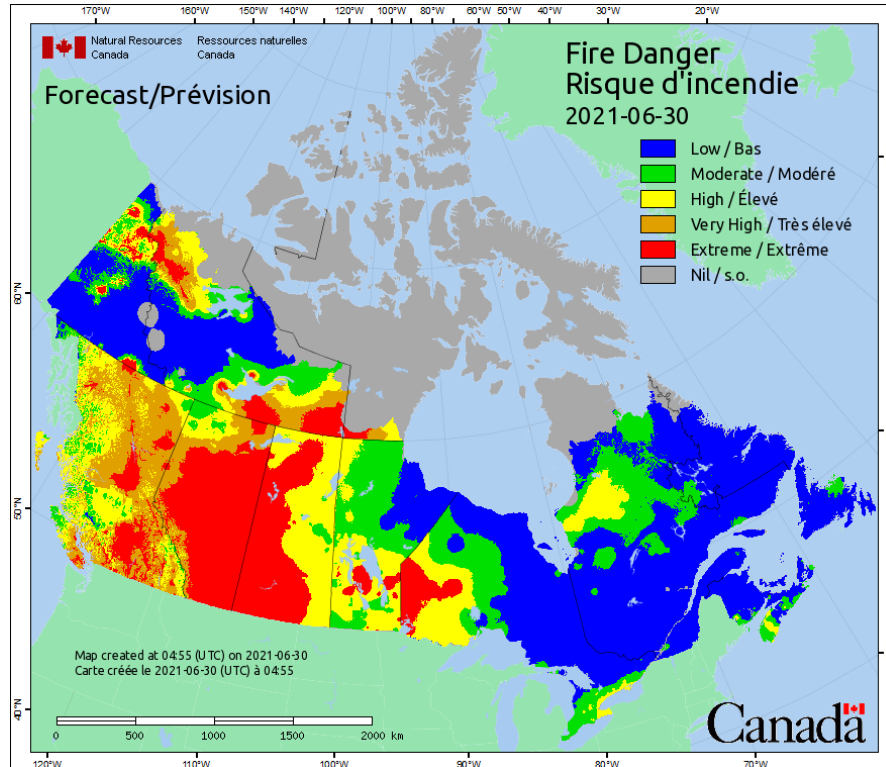


Figure 8: Fire Danger mapping by Natural Resources Canada.

Many municipalities continue to implement burning restrictions. Additional information is available through the local municipal offices or through the interactive [Current Municipal Burning Restrictions](#) map.

Impacts due to Dry Conditions

On farm water supplies are generally below or well below normal for this time of year. There continues to be reports of well water tables significantly lower than normal, hauling water, moving livestock or drilling new/deeper wells to secure water sources. Livestock producers who have been affected by dry conditions on pasture in Manitoba can apply for funding to support water source development under [Ag Action Manitoba](#) (BMP 503).

High temperatures, strong winds, and lack of widespread rainfall has continued to stress Manitoba crops. Many crops are maturing faster than normal and moving into reproductive stages faster than expected due to drought stress. First-cut hay is underway, with reported yields ranging from 50 to 80% of normal, though with high quality. June rains have helped pastures, however more moisture is required to sustain growth. Grasshoppers continue to be an issue in many regions. Manitoba Agriculture's website has information and resources for producers on how to manage [crop and livestock production during dry conditions](#). Additionally, the [Manitoba Hay Listing Service](#) is active; producers with extra feed or looking for feed are encouraged to list their available supplies for sale.

Agricultural spraying season coupled with the hot and dry conditions resulted in extremely high water demands on some water treatment plants and distribution systems at the beginning of June, resulting in some water suppliers implementing conservation measures. Some communities continue to implement voluntary or mandatory water conservation restrictions due to low reservoir levels, including the City of Morden.

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

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

Manitoba Infrastructure - Reservoir level information:

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

Manitoba Conservation and Climate's Fire Program:

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

Manitoba Agriculture and Resource Development:

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://www.agr.gc.ca/eng/agriculture-and-climate/drought-watch>

United States Drought Monitor:

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