Water Availability and Drought Conditions Report

JULY 2020

Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for July 2020.
- Precipitation conditions over the past month, three month, and twelve month periods are as follows:
  - During July, most of Manitoba observed normal (85 to 115 % of median) to above normal (> 115 %) precipitation conditions. Some regions of moderately (60 to 85 %) to severely (40 to 60 %) dry conditions were observed in parts of the Interlake, near Riding Mountain National Park, and within a few isolated pockets in the southwest region.
  - Over the past three months (May, June, July), much of agri-Manitoba observed normal or above normal amounts of rainfall. However, large regions of moderately to severely dry conditions were observed in parts of the Interlake, eastern, central and southwest regions. In northern Manitoba, precipitation conditions were above normal.
  - Over the past 12 months, much of the northwest and Interlake regions observed moderately dry precipitation conditions, while conditions across the remainder of agri-Manitoba and across northern Manitoba were generally normal to above normal.
- As of August 4, 2020, streamflows and lake levels across Manitoba were generally normal (25^{th} – 75^{th} percentile) to much above normal (> 90^{th} percentile). Below normal (10^{th} – 25^{th} percentile) conditions were observed on the Qu'Appelle River and much below normal (< 10^{th} percentile) conditions on Lake Manitoba.
- As of the end of July 2020, most groundwater levels from indicator aquifers were in the normal (25^{th} – 75^{th} percentile) range. Levels for both the carbonate aquifer and the sand and gravel aquifer in the Steinbach area were in the below normal range (10^{th} – 25^{th} percentile).
- The July 31, 2020 Canadian Drought Monitor assessment showed a region of abnormally dry conditions (D0) giving way to moderate drought (D1) conditions in the south Interlake and a portion of central agri-Manitoba.
- Reservoirs are generally at or close to full supply levels. There are currently no concerns over reservoir water supplies.
- As of August 3, 2020, the majority of the southern region of agri-Manitoba was experiencing optimal to wet soil moisture conditions at 0 - 120 cm depth. However, the regions surrounding Birch River, Pipe Lake, Eden, Gladstone, Virden, Forrest, Shilo, Pierson, Moosehorn, Narcisse, Marchand and Menisino showed dry to very dry conditions.
- Rapid growth and development of all crops was observed over the past two weeks, encouraged by warm, sunny weather. Many parts of the province would benefit from a gentle rain to help with grain formation in corn, sunflowers, and soybeans. Due to dry conditions in the Interlake, forage shortages are anticipated.

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.

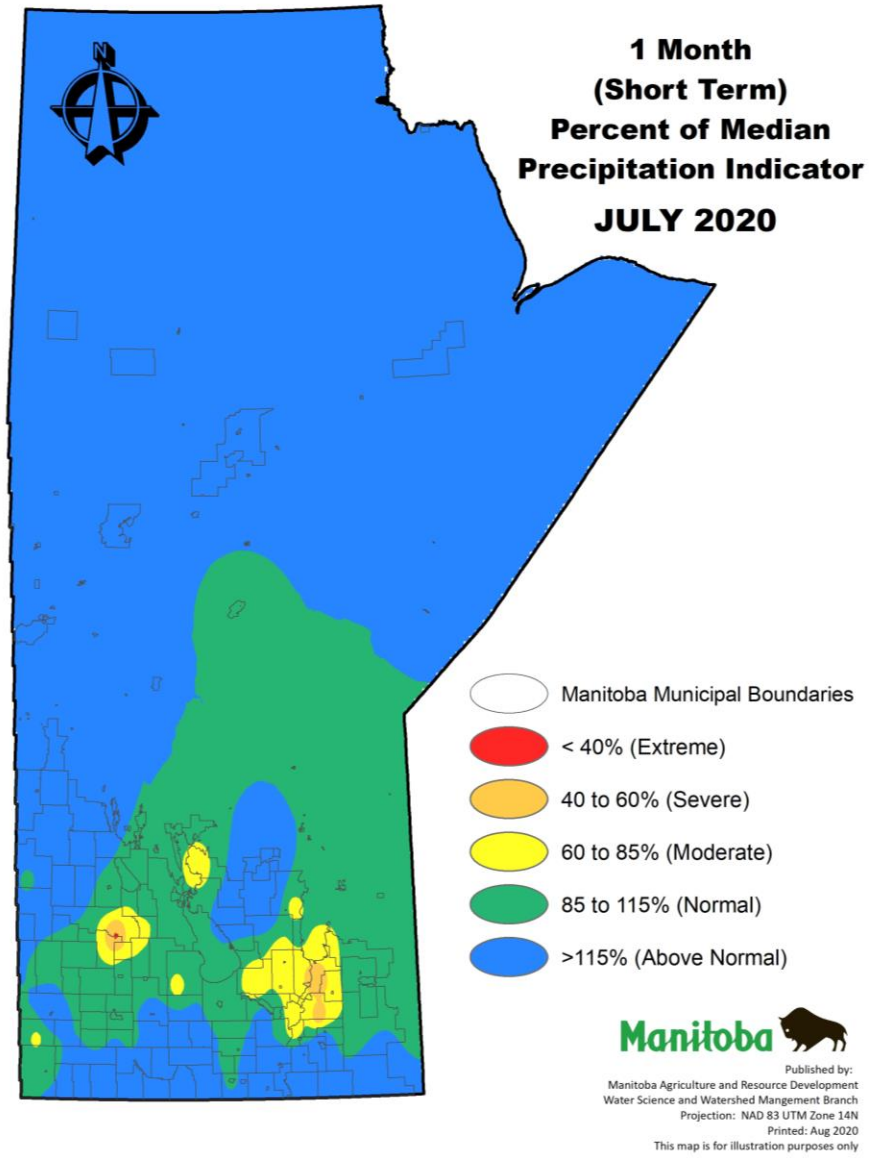

Figure 1: One month (short term) per cent of median precipitation indicator.

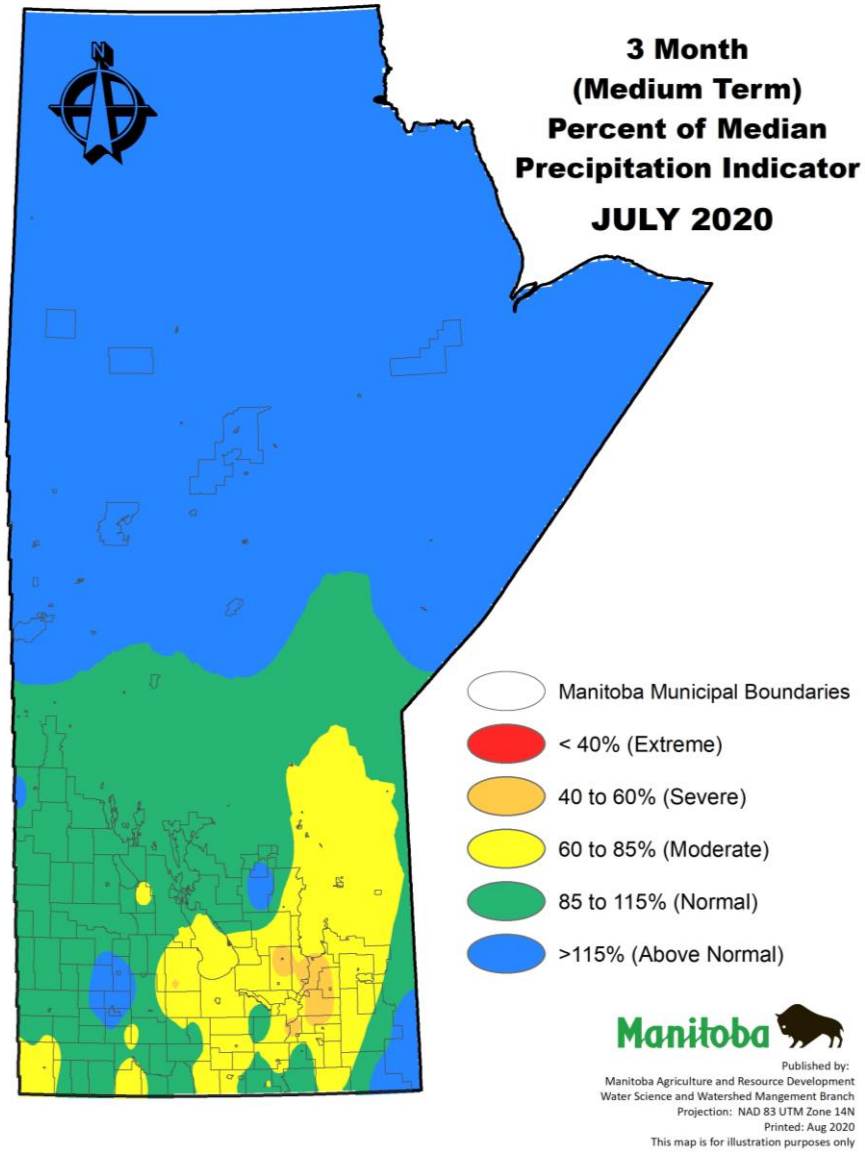

Figure 2: Three month (medium term) per cent of median precipitation indicator.

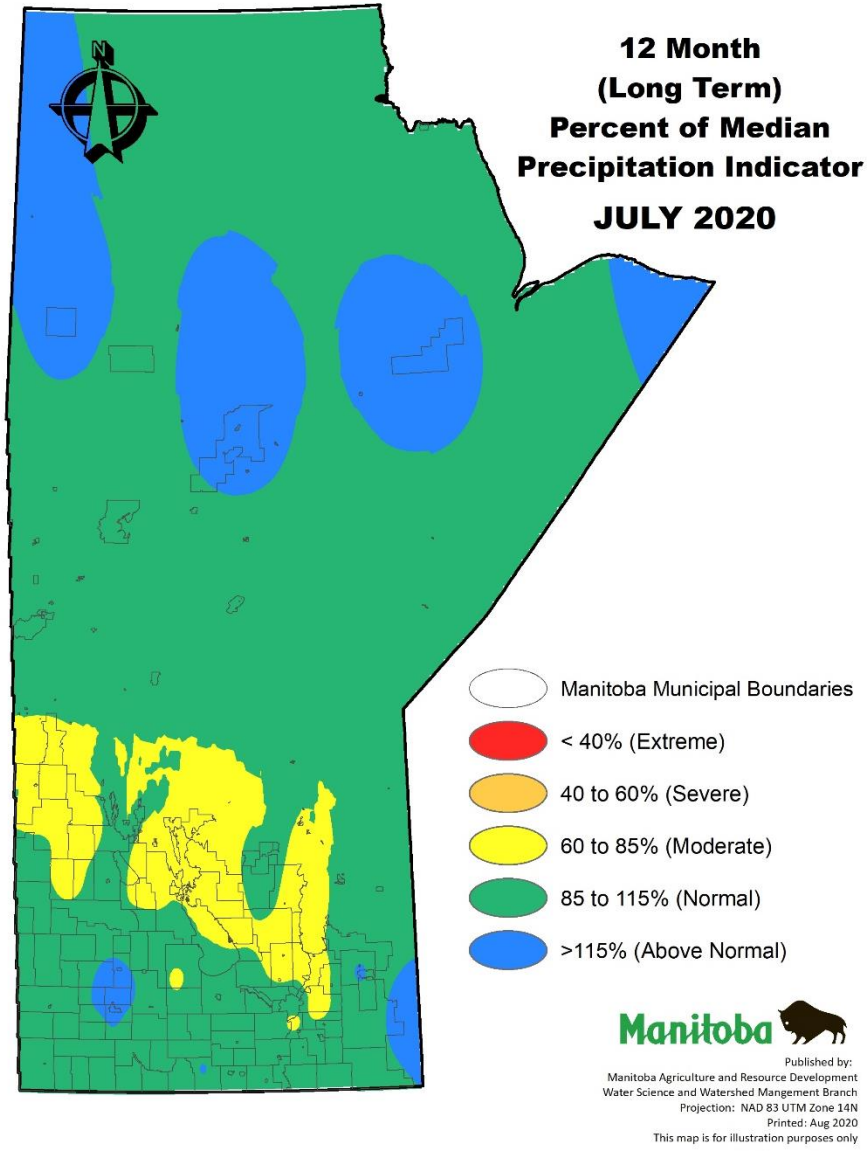

Figure 3: Twelve month (long term) per cent of median precipitation indicator.

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 4, 2020.

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.

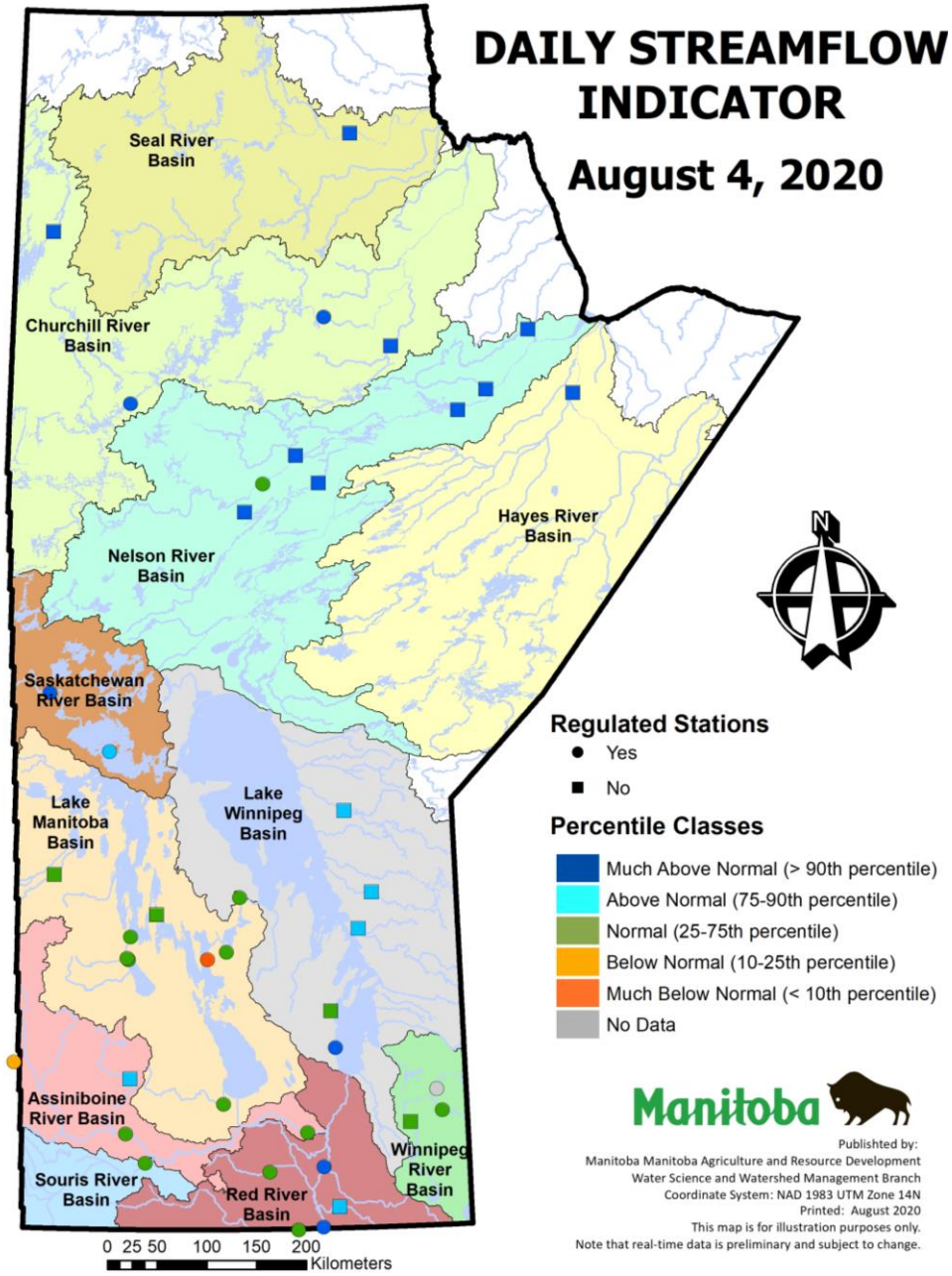

Figure 4: Daily streamflow and lake level indicator for August 4, 2020.

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.

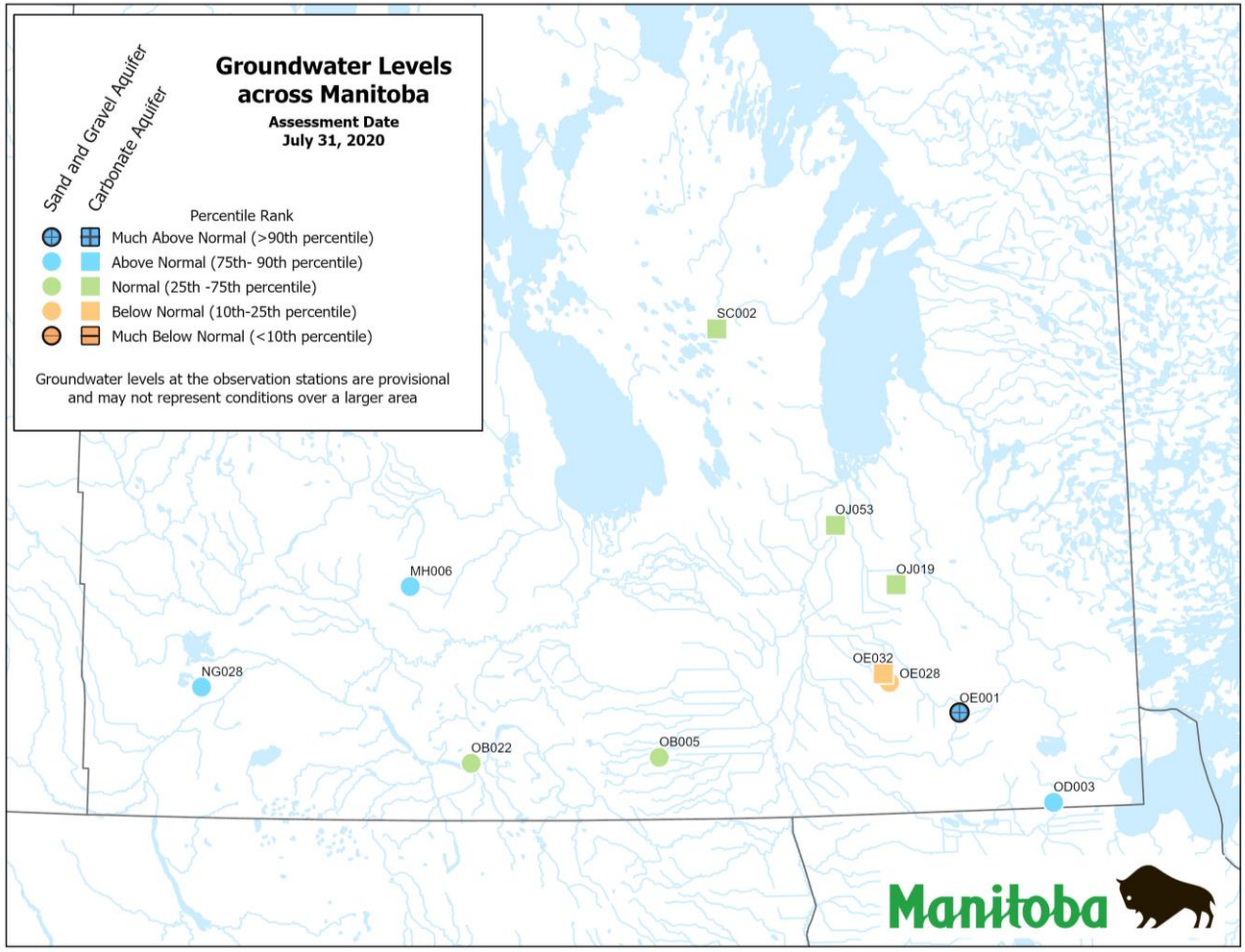

Figure 5: Groundwater indicator on July 31, 2020 for select groundwater monitoring sites.

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).

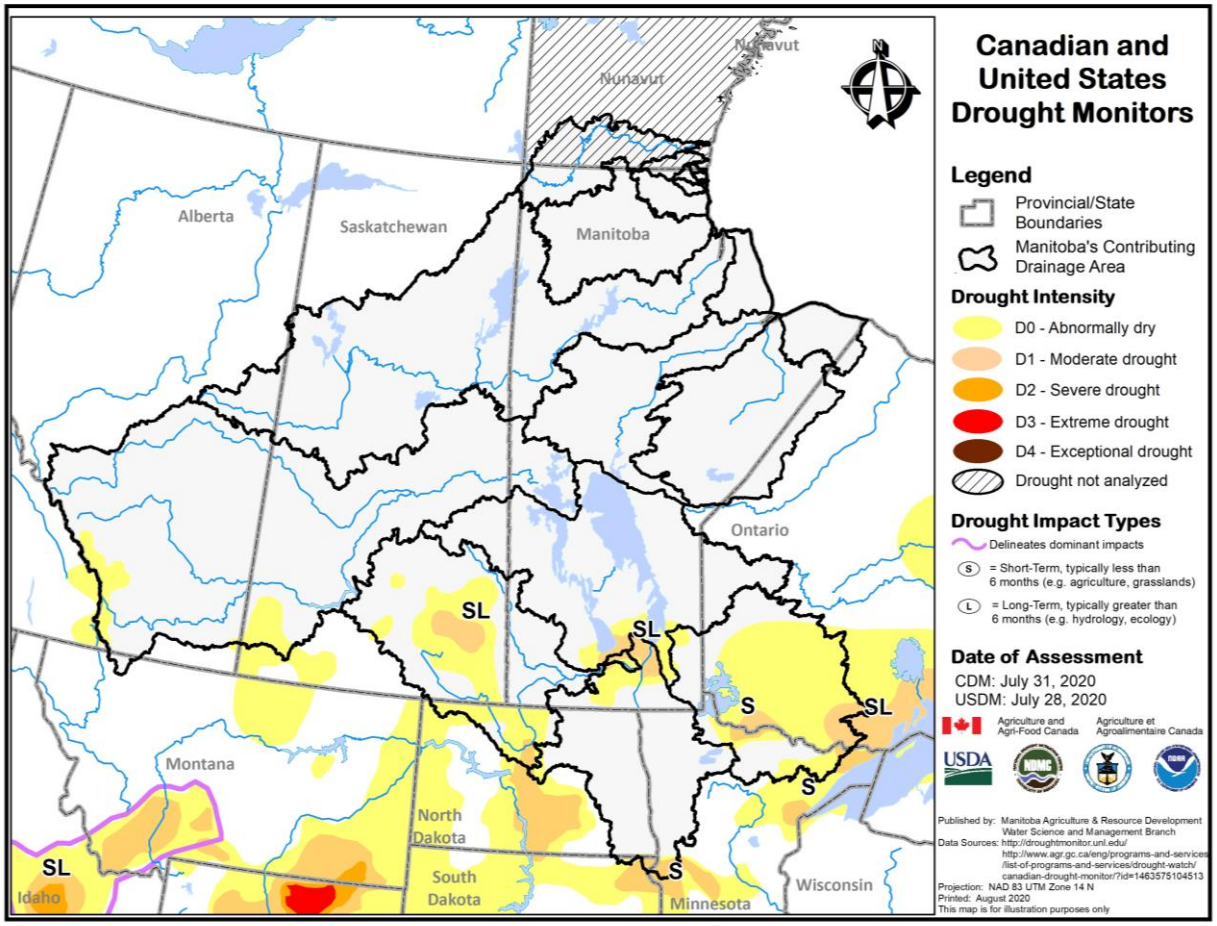

Figure 6: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of July 31, 2020.

Water Availability

Reservoir Conditions

Table 1: Water Supply Reservoir Levels and Storages – August 4, 2020 (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]	1403.13	August 4, 2020	0.63	300,000	307,915	103%
Lake Wahtopanah (Rivers)*	Rivers	1,536	1536.95	August 4, 2020	0.95	24,500	26,632	109%
Minnewasta (Morden)*	Morden	1,082	1081.36	August 4, 2020	-0.64	3,150	3,043	97%
Stephenfield*	Carman, Pembina Valley Water Co-op	972	971.31	August 4, 2020	-0.69	3,810	3,487	92%
Vermilion*	Dauphin	1,274	1274.17	August 4, 2020	0.17	2,600	2,640	102%
Goudney (Pilot Mound)*		1,482	1482.14	August 4, 2020	0.14	450	457	102%
Jackson Lake*		1,174	1172.82	August 4, 2020	-1.18	2,990	2,693	90%
Manitou (Mary Jane)*		1,537	1536.57	August 4, 2020	-0.43	1,150	1,111	97%
Turtlehead (Deloraine)*	Deloraine	1,772	1771.53	August 4, 2020	-0.47	1,400	1,377	98%
Kenton Reservoir		1,448	1447.83	**July 5, 2020**	-0.17	600	588	98%
Killarney Lake		1,615	1615.16	July 27, 2020	0.16	7,360	7,433	101%
Lake Irwin		1,178	1177.83	August 4, 2020	-0.17	3,800	3,697	97%
Elgin		1,532	1532.06	**March 9, 2020**	0.06	520	524	101%
St. Malo		840	841.15	**April 12, 2020**	1.15	1,770	1,960	111%
Minnedosa		1,682	1683.16	August 4, 2020	1.16	1,688	2,009	119%
Boissevain	Boissevain	1,697	1697.81	**June 8, 2020**	0.81	505	578	114%

[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 14 (published on August 4, 2020) are provided in Table 2.

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

Region	General Dugout Condition
Eastern	Livestock water supply is adequate but it was noted that dugouts were getting low in areas that have received the least amounts of rain.
Interlake	Livestock water supplies are currently adequate. (July 28, 2020)
Southwest	Dugouts are full. (July 28, 2020)
Central	Water supplies are adequate for cattle on pasture. (July 28, 2020)
Northwest	Dugout levels remain adequate.

Soil Moisture

Manitoba Agriculture and Resource Development's mapping shows the soil moisture conditions for the top 120 cm on August 3, 2020.

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).

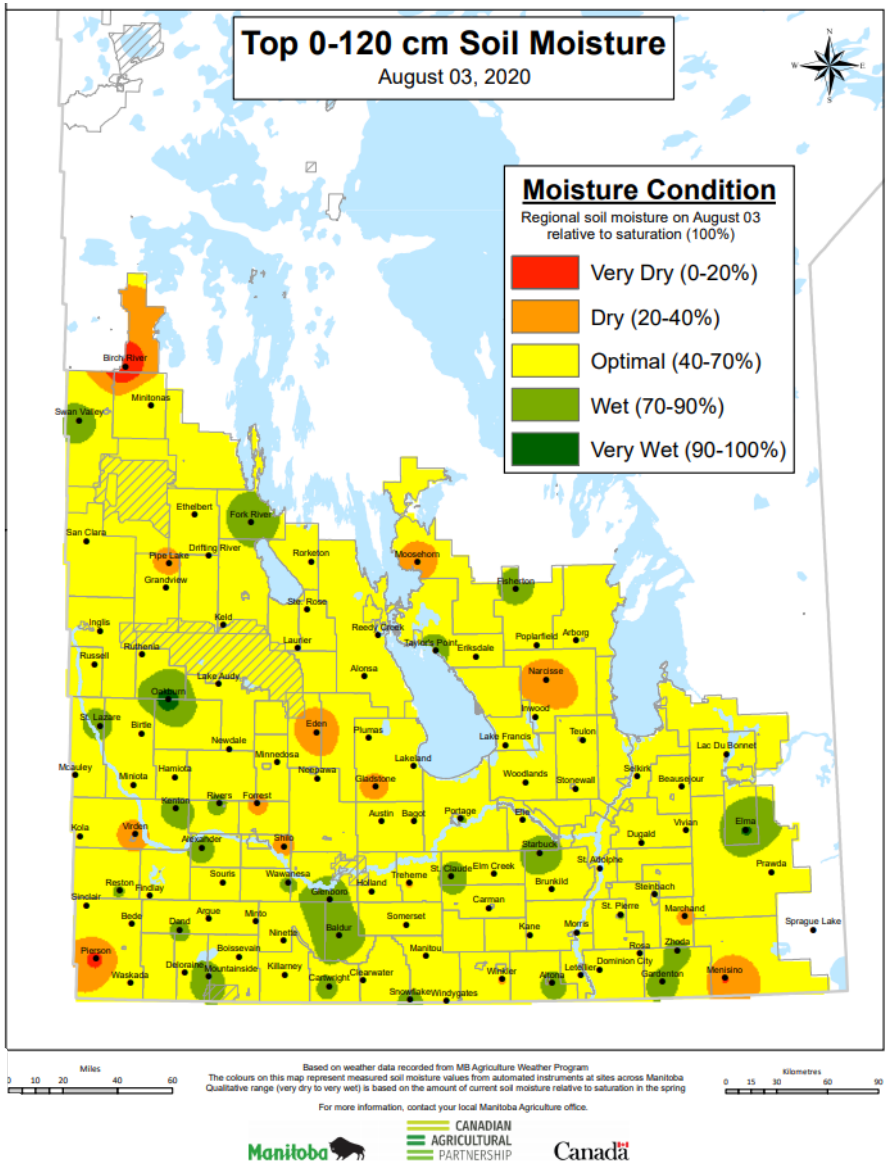

Figure 7: Manitoba Agriculture and Resource Development's August 3, 2020 mapping of soil moisture conditions in the top 0 – 120 cm.

Wildland Fires

As of August 4, 2020, Conservation and Climate's Wildfire Program reported 113 wildfires this year, burning a total area of 49,471 hectares to date. Most of the burned area occurred in the eastern and western regions.

Natural Resources Canada mapping of Fire Danger as of August 4, 2020 was low to moderate across most of Manitoba, with some pockets of high risk. Five municipalities had burning restrictions in place as of August 5, 2020.

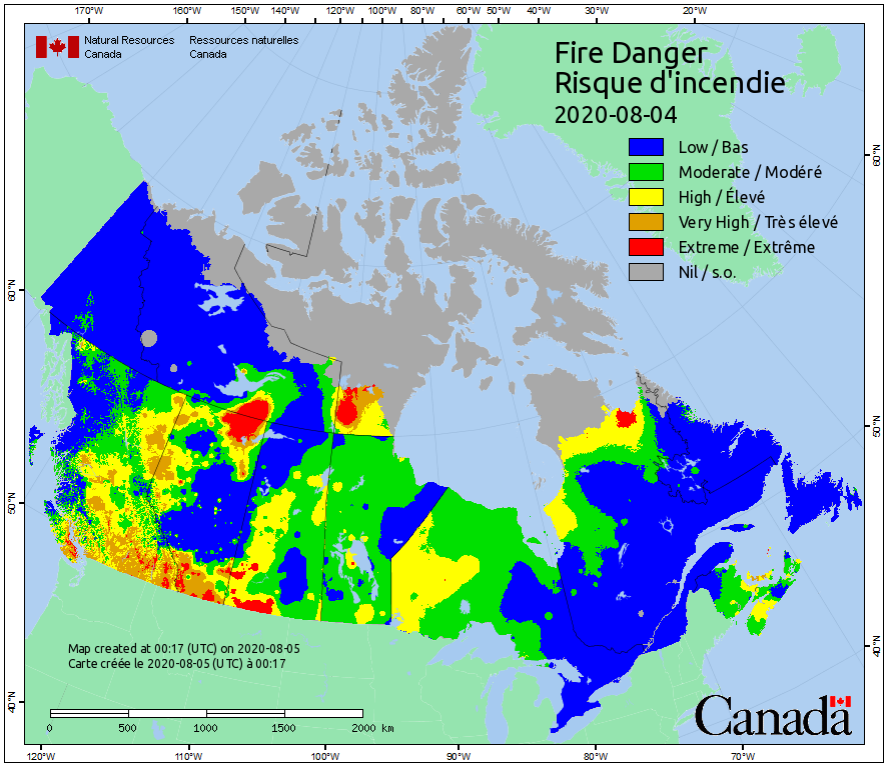

Figure 8: Fire danger mapping by Natural Resources Canada.

Impacts due to Dry Conditions

Overall, there has been rapid growth and development of all crops across agri-Manitoba over the past two weeks, encouraged by warm, sunny weather. Many parts of the province would benefit from a gentle rain to help with grain formation in corn, sunflowers, and soybeans.

In the Interlake, dry conditions have continued for most of the region and it is expected that yields will be impacted. Drought stress symptoms are becoming more evident in soybean and cornfields throughout the region, where fill will likely be impacted by lack of precipitation. Pastures continue to decline, and without rain arriving shortly some producers may have to take cattle off pasture to avoid further damage. Native hay yields will be poor in most areas due to lack of rainfall. First cut hay is essentially complete, and although better than last year in many cases, yields will be below average for most. Fields cut in the last three weeks are seeing little to no regrowth in many areas due to lack of rain. Forage shortages are anticipated.

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 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/