08Water Availability and Drought Conditions Report

APRIL 2020

Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for April 2020.
- Precipitation conditions over the past month, three month, and twelve month periods are as follows:
  - During April, much of agro-Manitoba observed moderately (60 to 85 % of median) to severely (40 to 60 %) dry conditions, with a pocket of extremely dry (< 40 %) conditions in the southwest corner of the province. However, large portions of central and southwest agro-Manitoba and a few pockets in the eastern region observed normal (85 to 115 %) to above normal (> 115 %) precipitation. Generally, northern Manitoba observed normal to above normal precipitation during April.
  - Over the past three months (February, March, April), conditions ranged from moderately to extremely dry across agro-Manitoba. The Interlake and portions of the central and southwest regions observed the driest conditions during this period. Much of northern Manitoba observed normal to above normal conditions, except for the northeastern region which observed moderately dry conditions.
  - Over the past 12 months, the southern portion of agro-Manitoba observed normal conditions, while the northern portion of agro-Manitoba observed moderately dry conditions with some pockets of severely dry conditions surrounding Swan River and Ste. Rose. In northern Manitoba, conditions ranged from normal to moderately dry.
- As of April 30, 2020, streamflows and lake levels generally ranged from normal (25^{th} – 75^{th} percentile) to much above normal (> 90^{th} percentile) across the province. Below normal (10^{th} – 25^{th} percentile) conditions were observed on the Icelandic and Mossy Rivers and much below normal (< 10^{th} percentile) conditions on Lake Manitoba.
- Spring recharge to date has been near normal for most aquifers and water levels ranged from normal (25^{th} – 75^{th} percentile) to much above normal (> 90^{th} percentile) at most locations.
- The April 30, 2020 Canadian Drought Monitor assessment showed regions of abnormally dry conditions (D0) extending from Swan River eastward into the Interlake. A small region of moderate drought conditions (D1) is located just north of Lake Manitoba extending from Ste. Rose to Ashern.
- Reservoirs are generally at or close to full supply levels after spring runoff. There are currently no concerns over reservoir water supplies.
- Despite lower than normal overwinter precipitation and normal to below-normal local spring runoff, as of May 5, 2020, soils remained wet to saturated across most of agro-Manitoba.
- Some cattle were being moved onto pasture ahead of the busy seeding season, but many remained in yards where feed supplies are running low.

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.

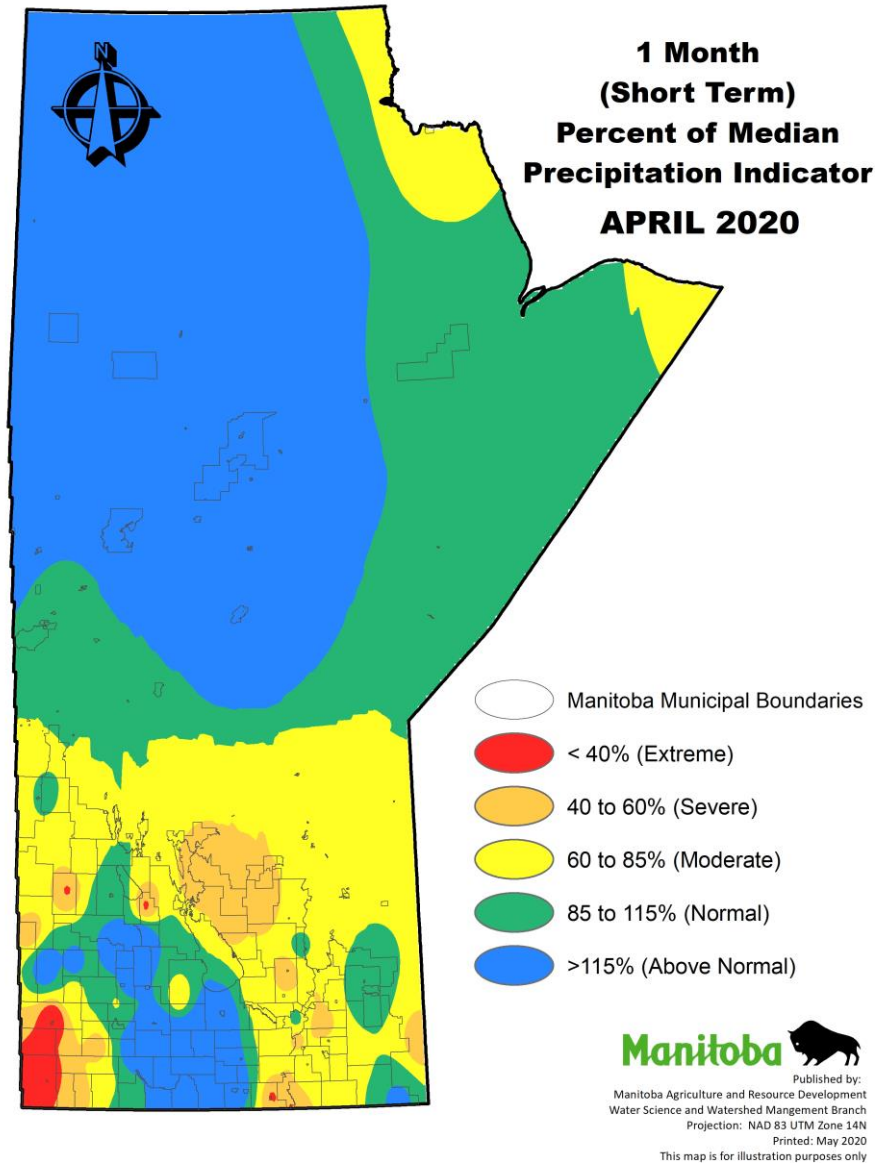

Figure 1: One month (short term) per cent of median precipitation indicator.

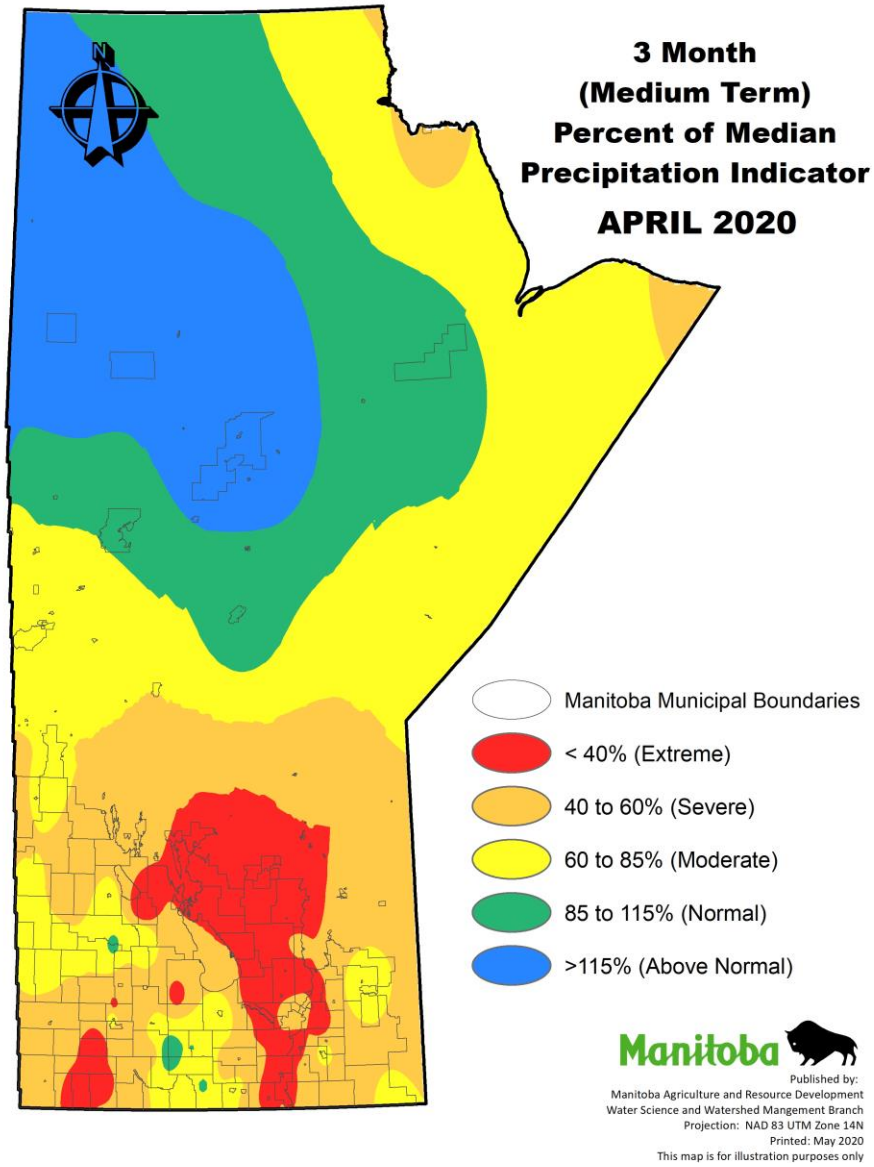

Figure 2: Three month (medium term) per cent of median precipitation indicator.

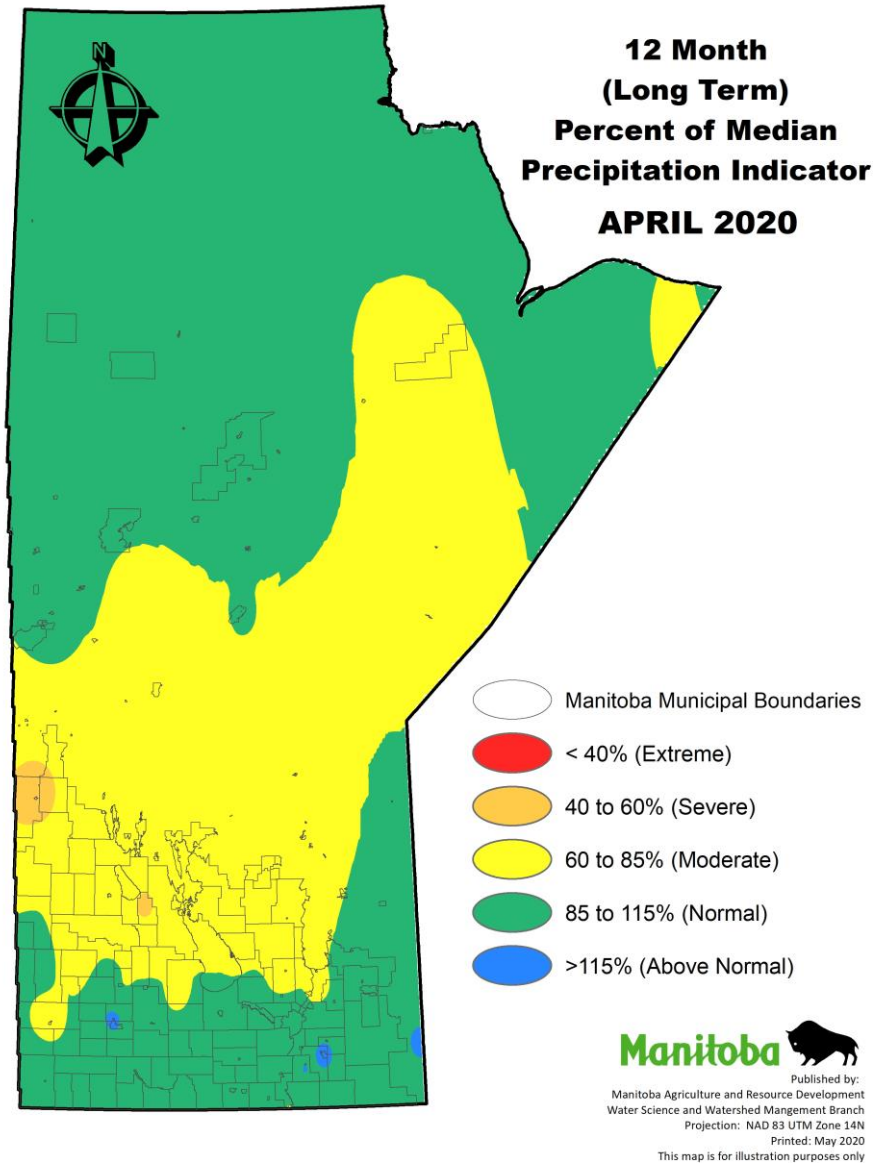

Figure 3: Twelve month (long term) per cent of median precipitation indicator.

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 April 30, 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.

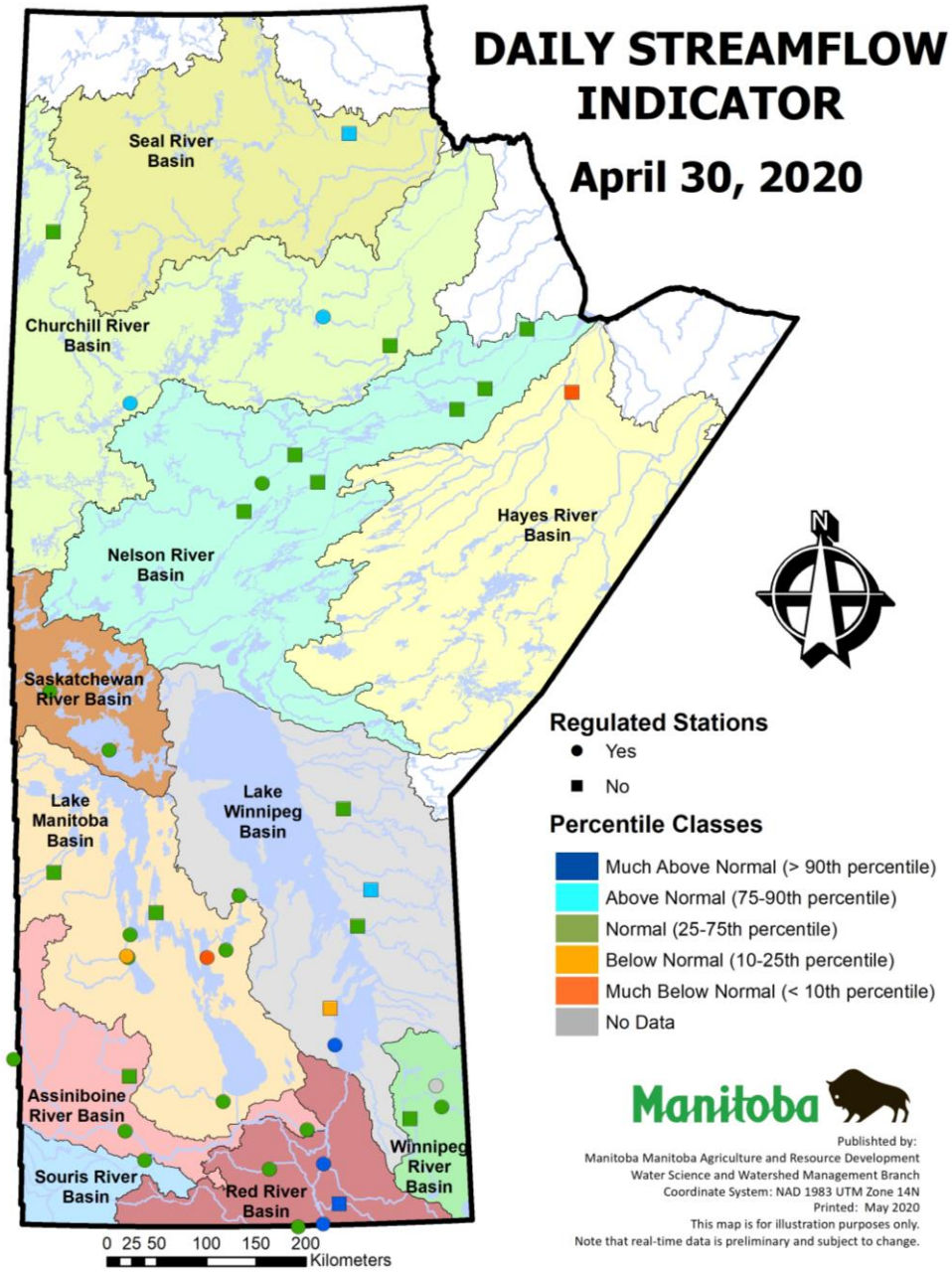

Figure 4: Daily streamflow and lake level indicator for April 30, 2020.

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.

All aquifers benefitted greatly from fall recharge. Water level increases from spring recharge was well underway and as of the end of April was in the average range for most aquifers. The exceptions are the Glenora and Interlake which observed slightly below average recharge. Water levels are in the normal and higher categories at this time for all sites. The Glenora aquifer is the only location that has decreased a category from last month; going from above normal to normal.

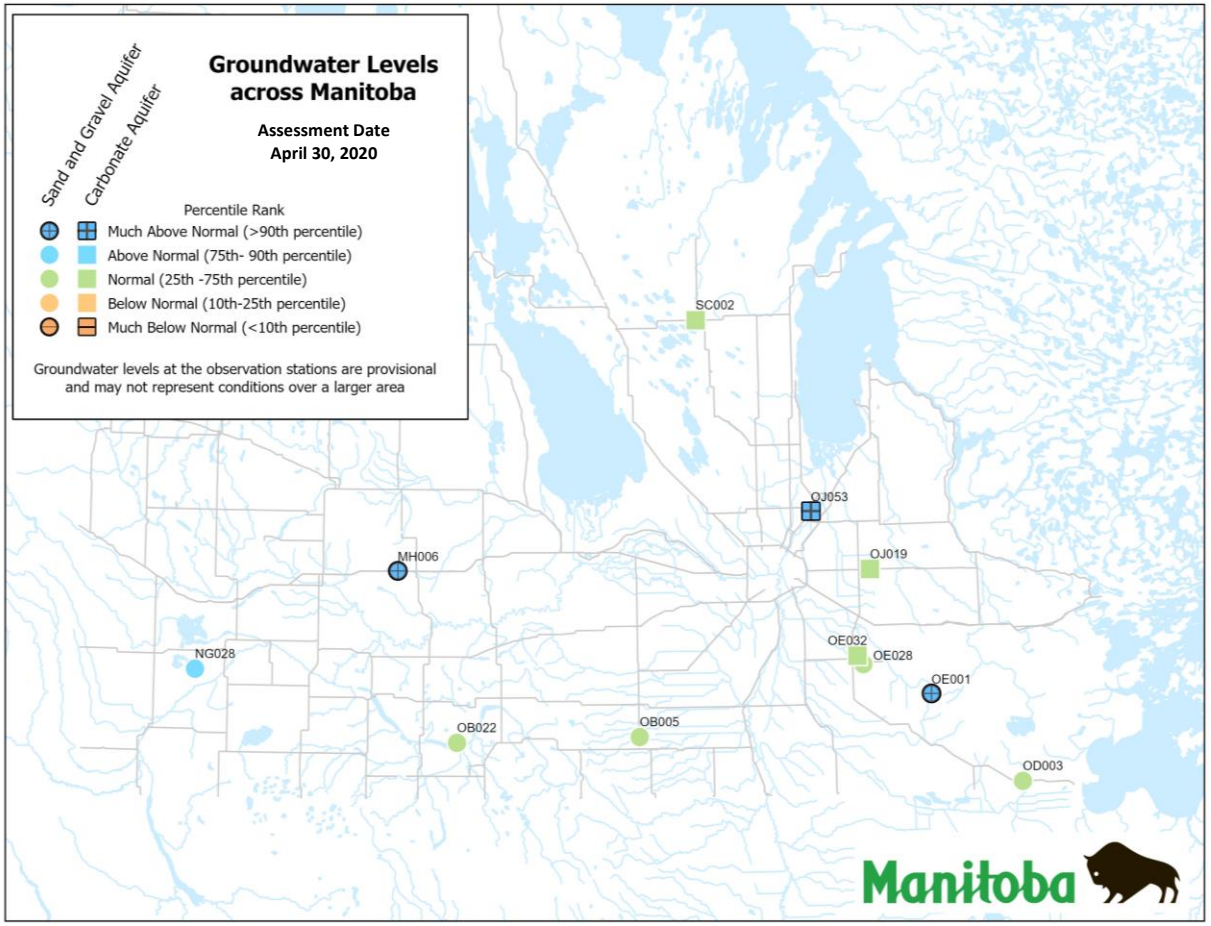

Figure 5: Groundwater indicator on April 30, 2020 for select groundwater monitoring sites.

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).

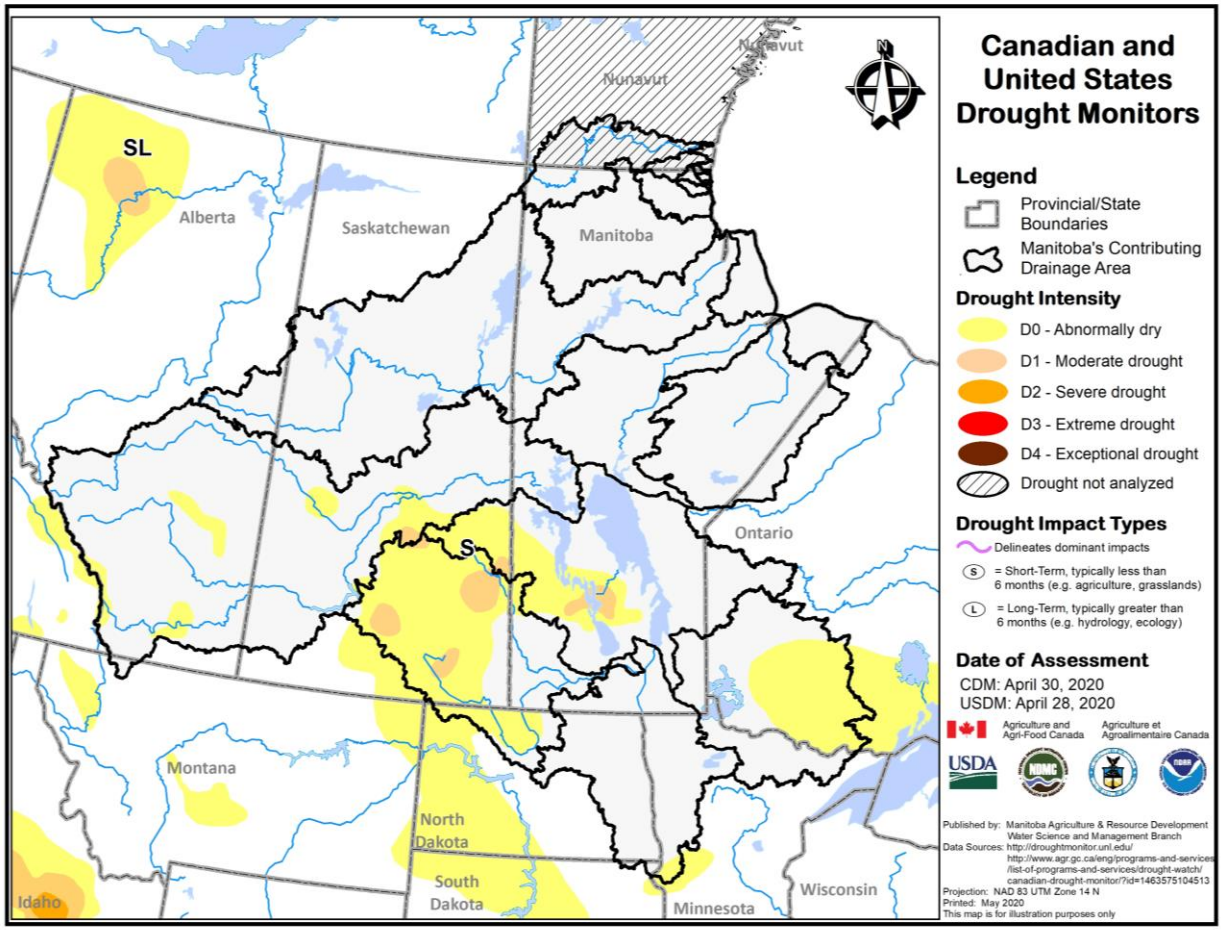

Figure 6: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of April 30, 2020.

Water Availability

Reservoir Conditions

Most reservoirs are at or near full supply level (Table 1) and there are no concerns over reservoir water supplies at this time.

Table 1: Water Supply Reservoir Levels and Storages – May 1, 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]	1400.39	May 1, 2020	-2.11	300,000	274,024	91%
Lake Wahtopanah (Rivers)*	Rivers	1,536	1537.56	May 1, 2020	1.56	24,500	28,005	114%
Minnewasta (Morden)*	Morden	1,082	1082.09	May 1, 2020	0.09	3,150	3,162	100%
Stephenfield*	Carman, Pembina Valley Water Co-op	972	973.09	May 1, 2020	1.09	3,810	4,324	113%
Vermilion*	Dauphin	1,274	1275.31	May 1, 2020	1.31	2,600	2,906	112%
Goudney (Pilot Mound)*		1,482	1482.38	May 1, 2020	0.38	450	469	104%
Jackson Lake*		1,174	1173.94	April 21, 2020	-0.06	2,990	2,975	99%
Manitou (Mary Jane)*		1,537	1537.69	May 1, 2020	0.69	1,150	1,171	102%
Turtlehead (Deloraine)*	Deloraine	1,772	1772.49	**April 1, 2020**	0.49	1,400	1,454	104%
Rapid City*		1,573.5	1574.99	May 1, 2020	1.49	200	304	152%
Kenton Reservoir		1,448	1447.79	**March 10, 2020**	-0.21	600	584	97%
Killarney Lake		1,615	1615.20	**March 18, 2020**	0.20	7,360	7,451	101%
Lake Irwin		1,178	1178.25	May 1, 2020	0.25	3,800	3,964	104%
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	1683.11	May 1, 2020	1.11	1,688	1,996	118%
Boissevain	Boissevain	1,697	1697.92	March 9, 2020	0.92	505	588	116%

[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 1 (published on May 5, 2020) are provided in Table 2.

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

Region	General Dugout Condition
Eastern	Availability of livestock water is adequate for the region.
Interlake	Dugout levels are average for this time of year.
Southwest	Dugouts are rated at full capacity.
Central	No report on dugout conditions.
Northwest	Dugouts are rated at full capacity.

Soil Moisture

Manitoba Agriculture and Resource Management's mapping shows the soil moisture conditions for the top 30 cm on May 4, 2020. The majority of agro-Manitoba is experiencing optimal to wet soil moisture conditions in the 0 - 30 cm depths. Areas in the Southeast near Gardenton, Prawda, Menisino and Dominion City have optimal soil moisture conditions. Only Birch River, Drifting River, and Shilo indicate dry soil moisture conditions at the surface. The northwest part of agro-Manitoba in the area of Plumas, Alonsa, St. Rose, and Fork River currently have very wet soil moisture conditions.

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).

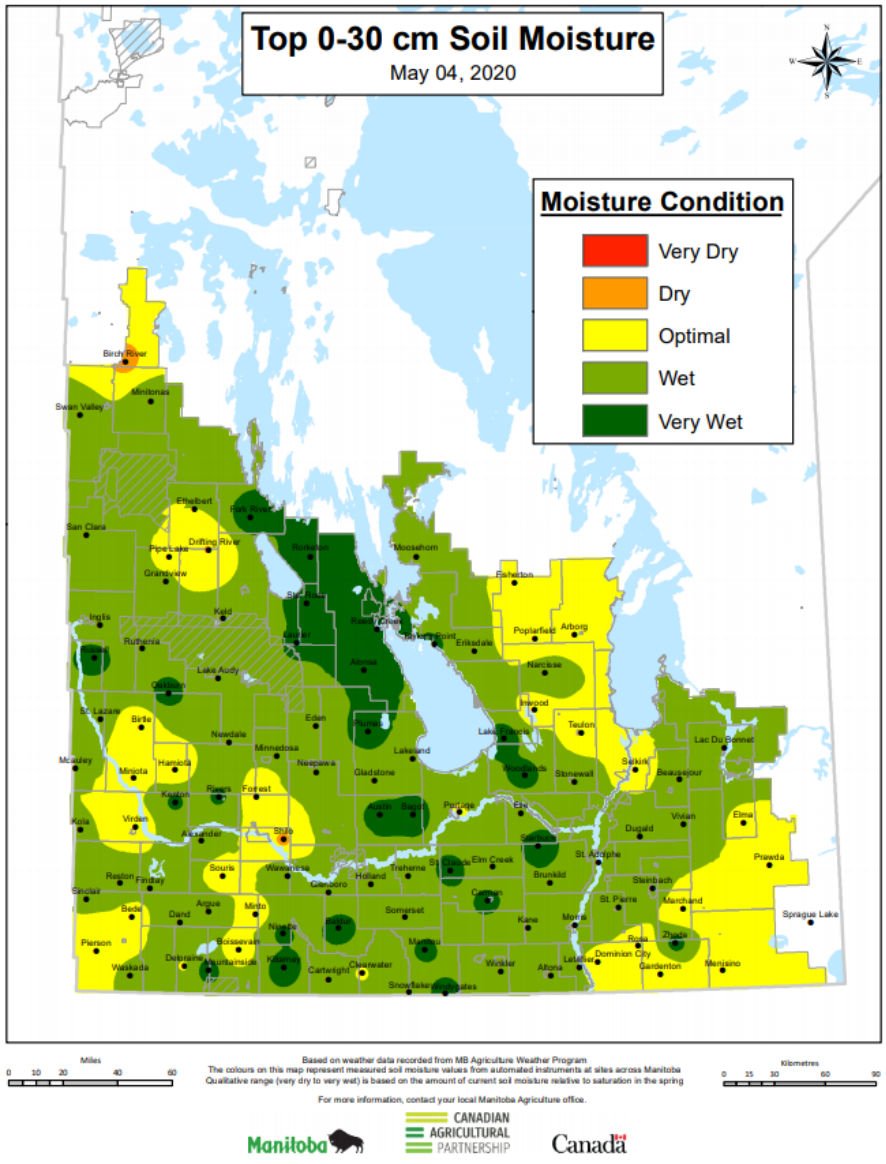

Figure 7: Manitoba Agriculture and Resource Management's May 4, 2020 mapping of soil moisture conditions in the top 0 – 30 cm.

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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Manitoba Infrastructure - Reservoir level information:
https://www.gov.mb.ca/mit/floodinfo/index.html

Environment and Climate Change Canada:
Flow and lake level information:
http://www.wateroffice.ec.gc.ca/index_e.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

Canadian Drought Monitor: *http://www.agr.gc.ca/drought*
United States Drought Monitor: *https://droughtmonitor.unl.edu/*