

# Water Availability and Drought Conditions Report

OCTOBER 2019

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## Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for October 2019.
- Precipitation conditions over the past month, three month, and twelve month periods are as follows:
  - A severe weather event during mid-October brought significant snowfall, resulting in normal (85 to 115 % of median) to above normal (> 115 %) precipitation conditions across most of the central, eastern and Interlake regions of agro-Manitoba and large portions of northern Manitoba. Conversely, western areas of agro-Manitoba observed moderately (60 to 85 %) to severely (40 to 60 %) dry conditions, with some pockets of extremely dry (< 40 %) conditions during October.
  - Over the past three months (August, September, October), conditions were normal to above normal across agro-Manitoba, with moderately dry conditions centered over Swan River extending north. Across northern Manitoba, conditions were normal to above normal with regions of moderately dry conditions surrounding Thompson and Flin Flon.
  - Over the past 12 months, the southern portion of agro-Manitoba observed normal to above normal conditions, while the northern portion of agro-Manitoba observed moderately dry conditions with some pockets of severely dry conditions surrounding Swan River, Ethelbert and Ste. Rose. In northern Manitoba, conditions ranged from normal to moderately dry.
- Streamflows and lake levels continued to increase during October due to melting of the snowpack accumulated during the mid-October severe weather event. Some streams went from below normal in September to setting record highs for October. As of October 31, 2019, below normal (10<sup>th</sup> – 25<sup>th</sup> percentile) conditions were observed on the Mossy River and Lake Manitoba.
- September and October precipitation has provided significant recharge to aquifers throughout the province.
- The October 31, 2019 Canadian Drought Monitor assessment showed a decrease in the extent and severity of drought conditions since September 30, 2019. However, regions of abnormally dry conditions (D0) remained both in the Swan River area and a region centered over Flin Flon. A small region of D0 conditions developed to the north of Thompson, between South Indian Lake and Split Lake.
- There are currently no concerns over reservoir water supplies.
- October rainfall and snowfall continued to replenish on-farm water supplies. Feed shortages continue to be a concern.
- Government funding for water source development projects became available. Producers can inquire about the Water Source Development Program through [Ag Action Manitoba – Assurance: Beneficial Management Practices](#).

# 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.

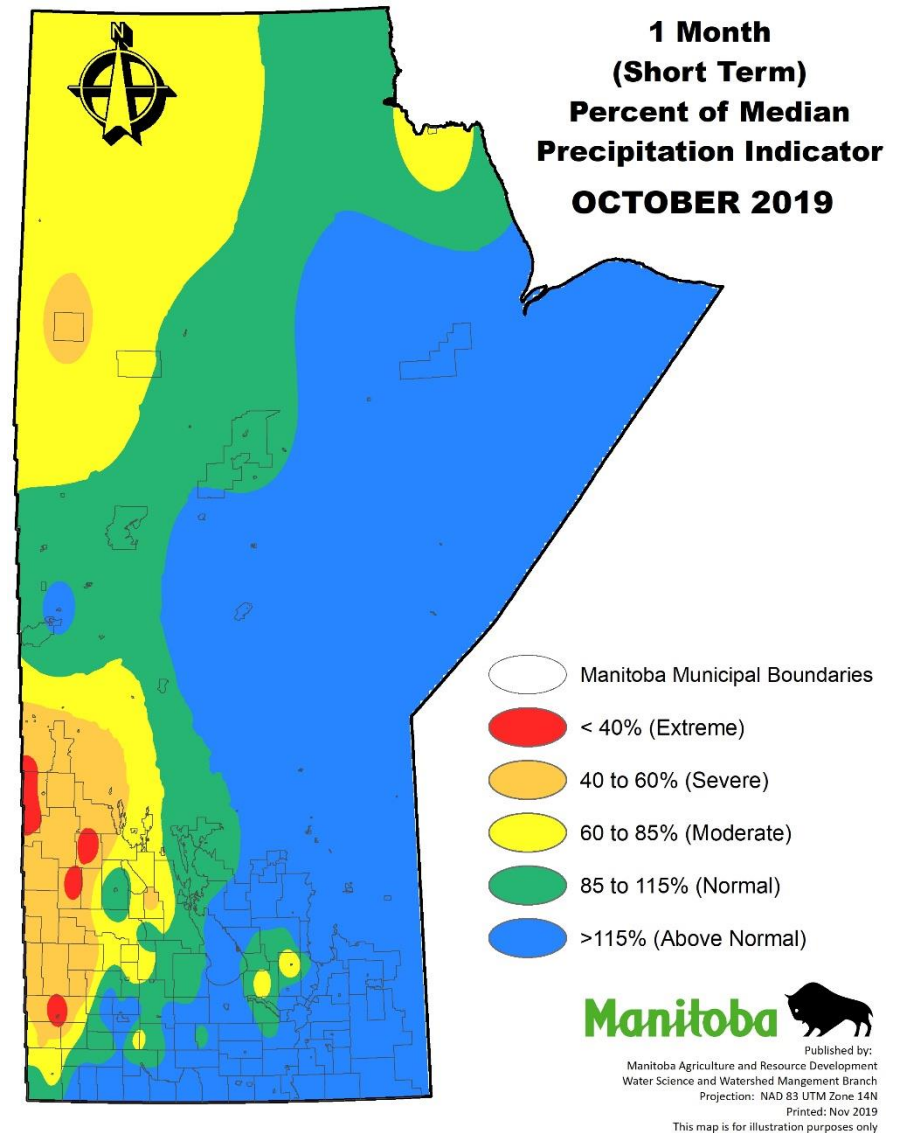


Figure 1: One month (short term) per cent of median precipitation indicator.

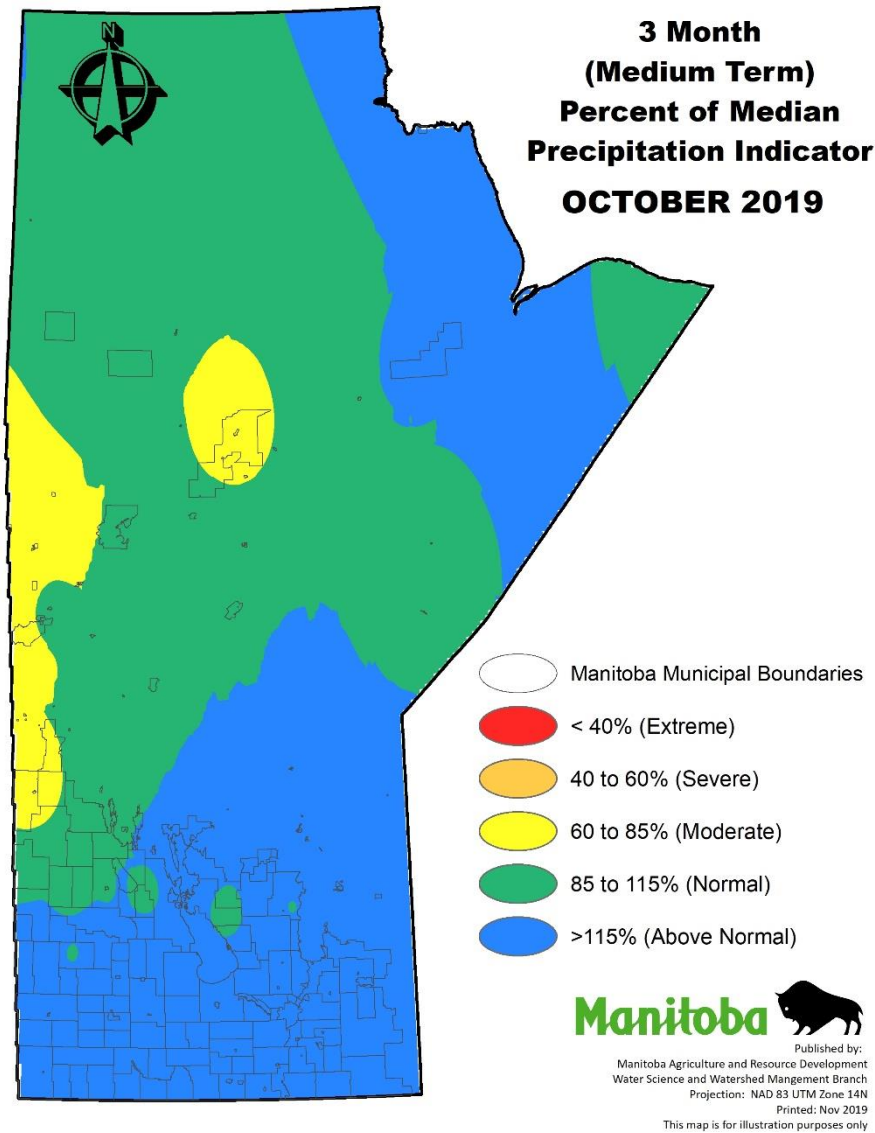


Figure 2: Three month (medium term) per cent of median precipitation indicator.

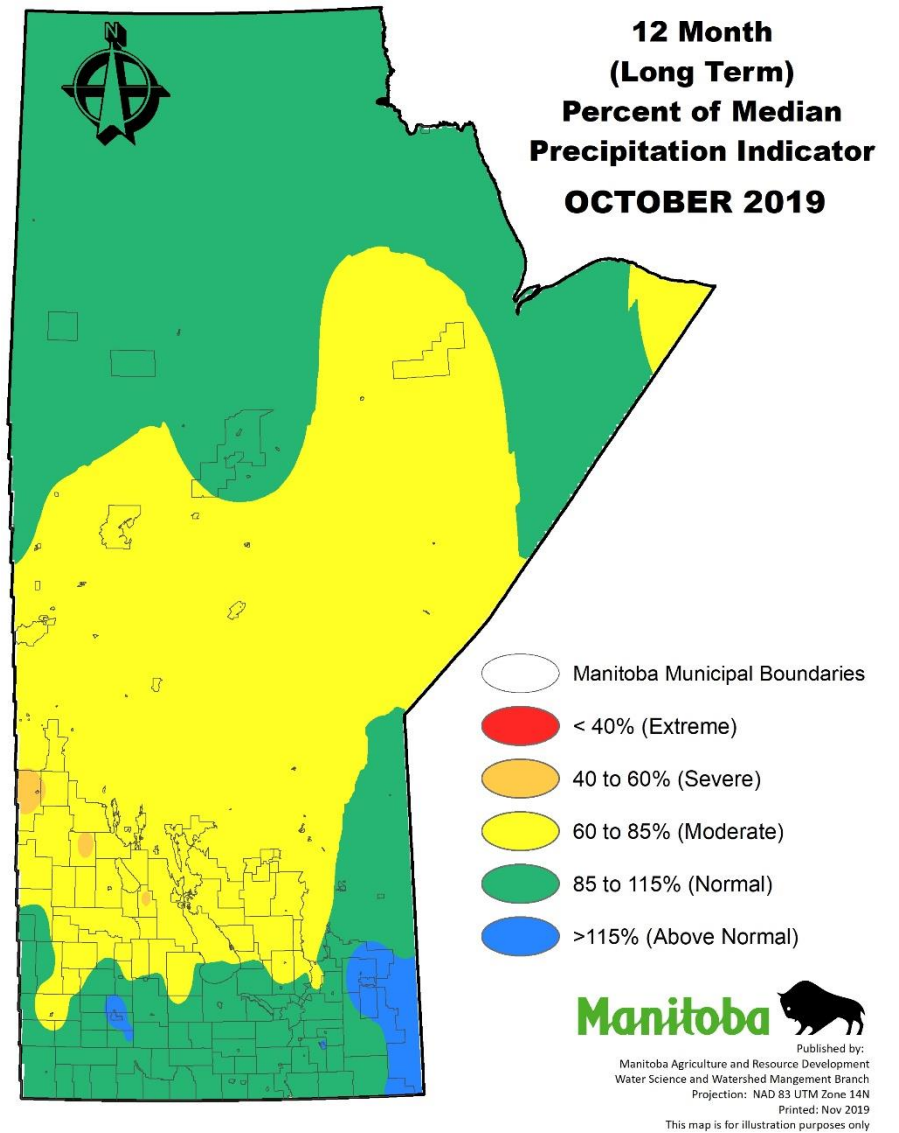


Figure 3: Twelve month (long term) per cent of median precipitation indicator.

### 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 October 31, 2019.

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.

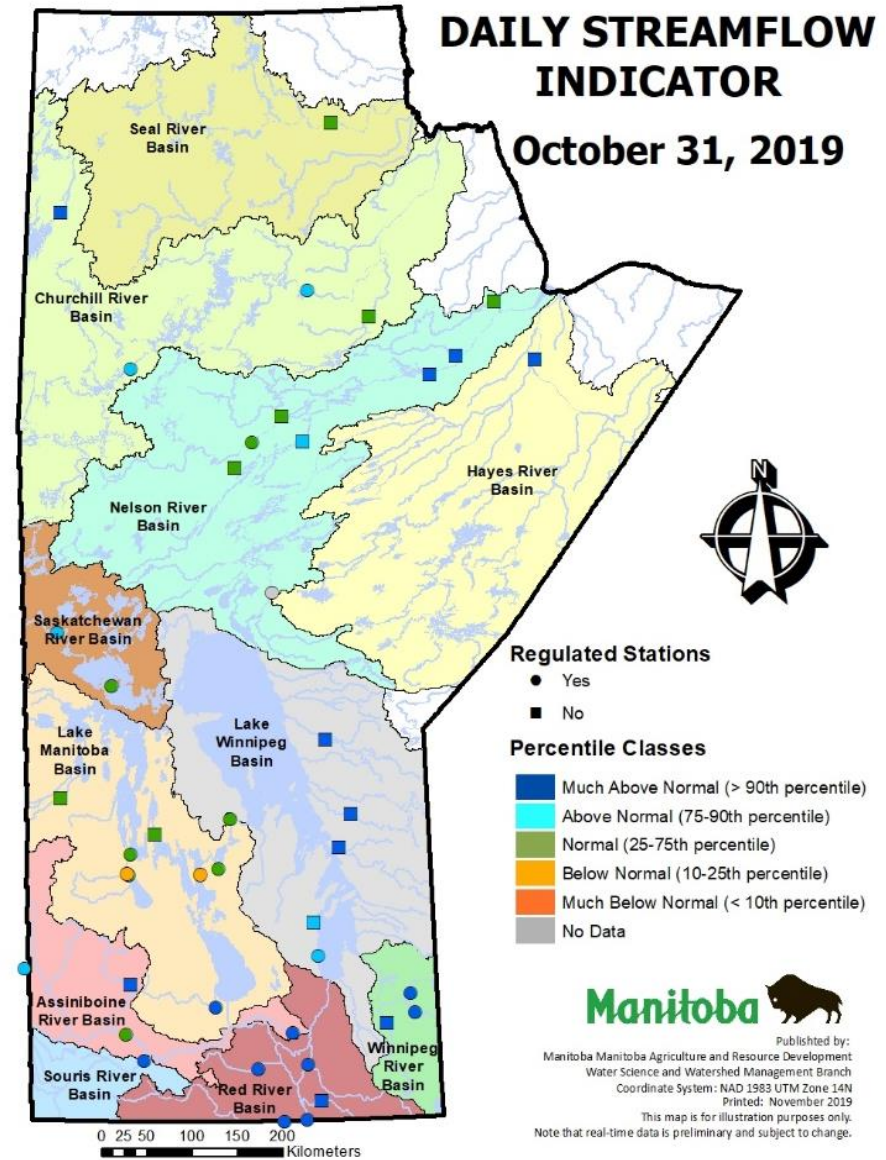


Figure 4: Daily streamflow and lake level indicator for October 31, 2019

## 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.

September and October precipitation has provided significant recharge to aquifers throughout the province. Groundwater levels in select monitoring sites (Figure 5) are all within the normal to much above normal ranges which is a province-wide improvement from mid-summer water levels. The Glenora and Winkler aquifers have recovered to median levels for this time of the year. All other locations are currently going into winter on the high side of median values.

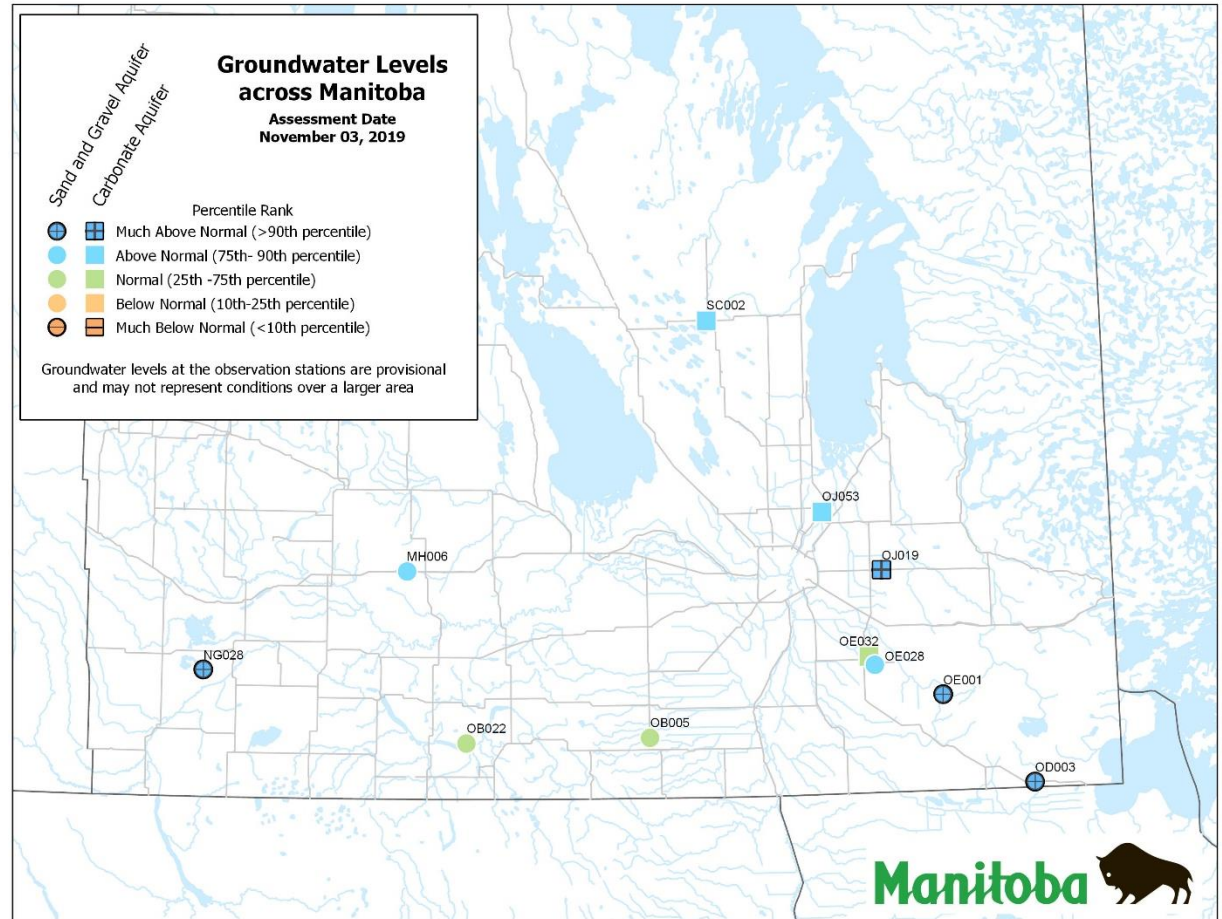


Figure 5: Groundwater indicator on November 3, 2019 for select groundwater monitoring sites.

## 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).

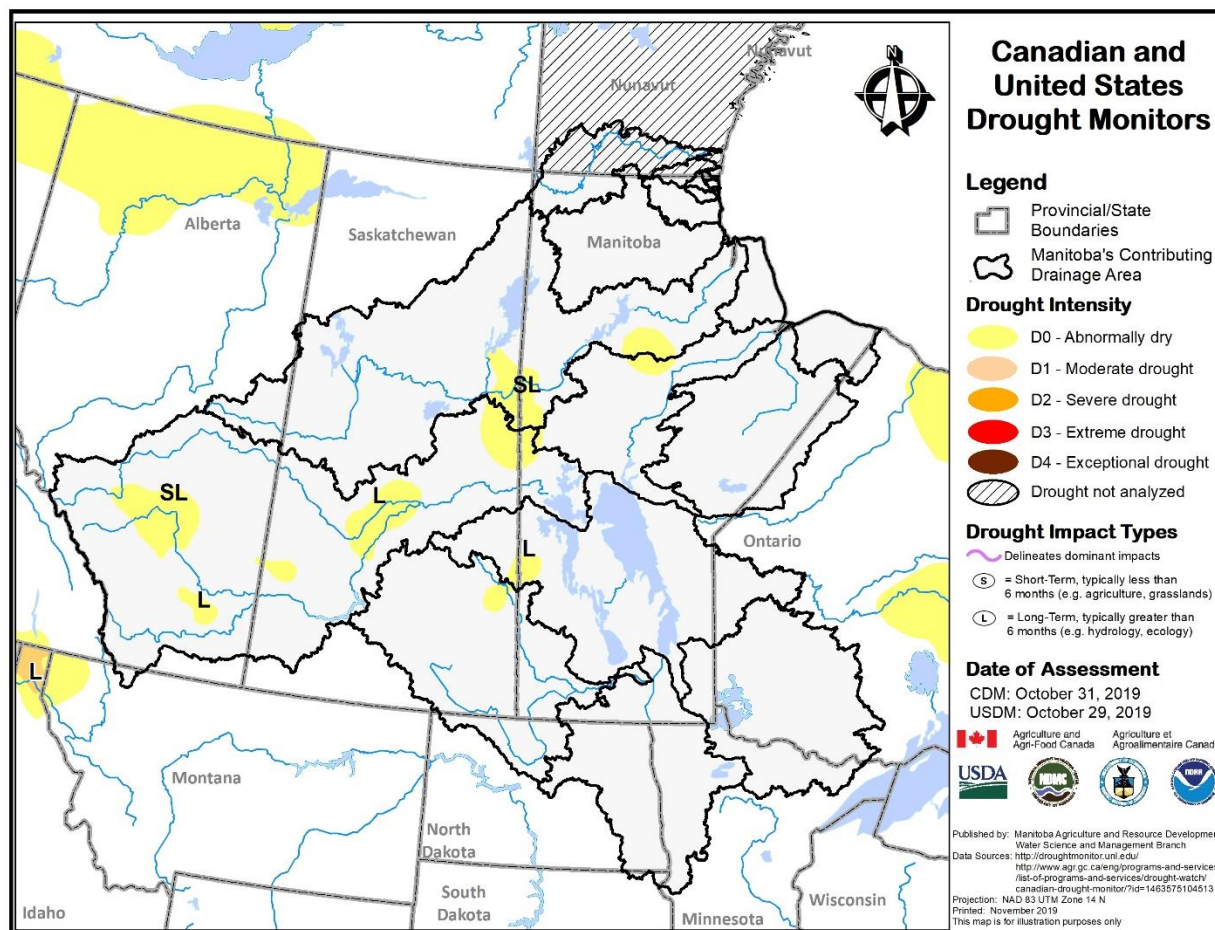


Figure 6: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of October 31, 2019.

# 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 – November 1, 2019 (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) <sup>1*</sup>	Brandon, Portage, Cartier Regional Water Co-op	1,402.5 <sup>1</sup>	1401.99	October 30, 2019	-0.51	300,000	293,723	98%
Lake Wahtopanah (Rivers)*	Rivers	1,536	1535.99	November 1, 2019	-0.01	24,500	24,492	100%
Minnewasta (Morden)*	Morden	1,082	1082.32	November 1, 2019	0.32	3,150	3,200	102%
Stephenfield*	Carman, Pembina Valley Water Co-op	972	972.79	November 1, 2019	0.79	3,810	4,182	110%
Vermilion*	Dauphin	1,274	1274.39	November 1, 2019	0.39	2,600	2,691	103%
Goudney (Pilot Mound)*		1,482	1482.43	November 1, 2019	0.43	450	472	105%
Jackson Lake*		1,174	1173.99	November 1, 2019	-0.01	2,990	2,987	100%
Manitou (Mary Jane)*		1,537	1537.14	November 1, 2019	0.14	1,150	1,154	100%
Turtlehead (Deloraine)*	Deloraine	1,772	1772.25	November 1, 2019	0.25	1,400	1,428	102%
Rapid City*		1,573.5	1573.98	November 1, 2019	0.48	200	234	117%
Kenton Reservoir		1,448	1447.39	<b>August 7, 2019</b>	-0.61	600	554	92%
Killarney Lake		1,615	1615.13	October 24, 2019	0.13	7,360	7,418	101%
Lake Irwin		1,178	1178.29	October 10, 2019	0.29	3,800	3,987	105%
Elgin		1,532	1531.99	<b>August 6, 2019</b>	-0.01	520	520	100%
St. Malo		840	842.40	October 15, 2019	2.40	1,770	2,170	123%
Minnedosa		1,682	1682.15	<b>August 26, 2019</b>	0.15	1,688	1,728	102%
Boissevain	Boissevain	1,697	1697.89	<b>June 24, 2019</b>	0.89	505	585	116%

<sup>1</sup> 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 27 (published on October 29, 2019) are provided in Table 2.

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

Region	General Dugout Condition
Eastern	Rain and snowfall have recharged dugouts and streams.
Interlake	Rain and snowfall have recharged dugouts and streams.
Southwest	Rain and snowfall have helped with dugout filling (October 22, 2019).
Central	Some dugouts that were dry have recharged with rain/snow and runoff.
Northwest	Water supply now looks sufficient (October 22, 2019).

## Soil Moisture

Manitoba Agriculture and Resource Management's mapping of sub-surface soil (0 – 120 cm) conditions for October 28, 2019 (Figure 7) ranges from optimal to very wet. The northwest and southwest regions are mostly at optimal soil moisture condition at depth. Areas around The Narrows are at very wet soil moisture. Precipitation events since the start of September have helped to re-charge sub-surface soil moisture. At some locations the water table is within the top three feet.

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).

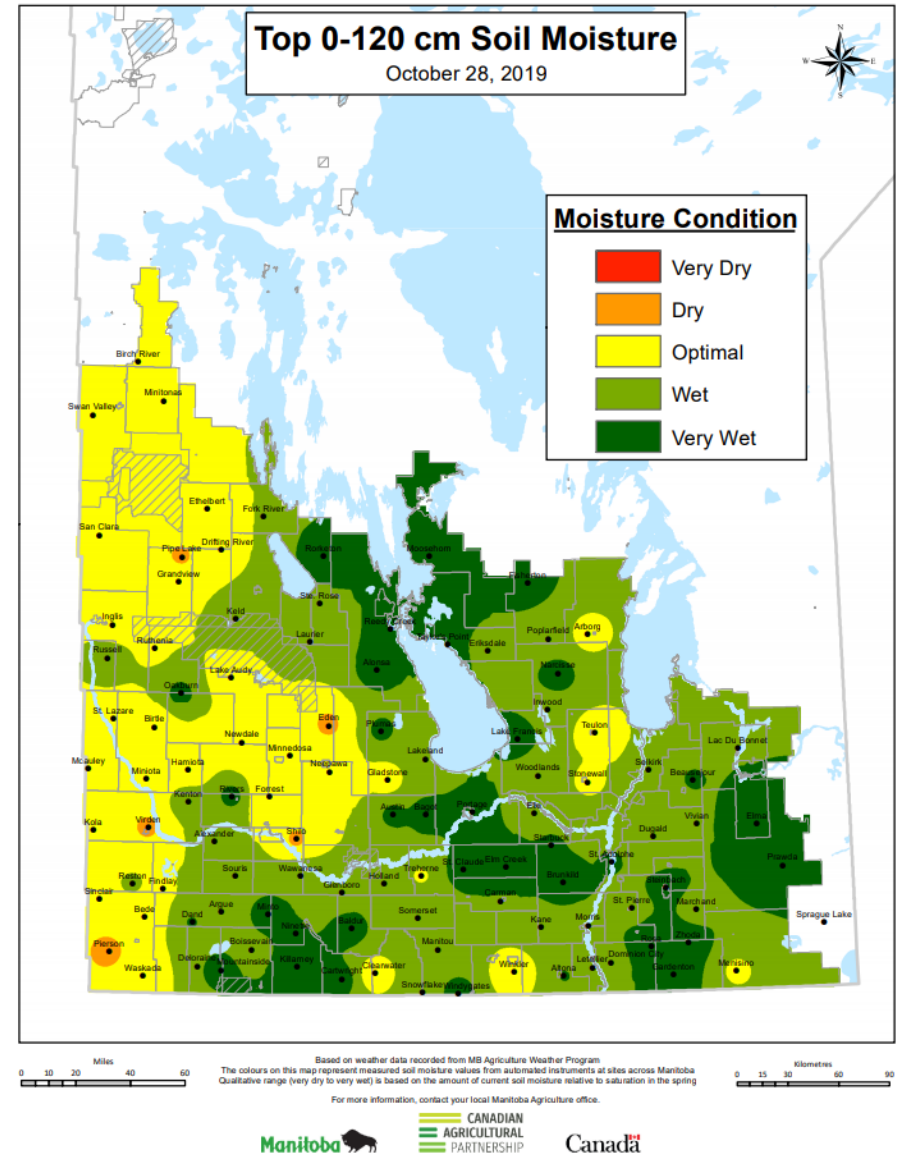


Figure 7: Manitoba Agriculture and Resource Management's October 28, 2019 mapping of soil moisture conditions in the top 0 – 120 cm.



## Impacts due to Dry Conditions

Manitoba Agriculture and Resources Management's Crop Report Issue 27 indicated that as of October 29, harvest progress is estimated at 85 % complete, which is below the three year average of 94 % for this time of year due to wet conditions. Information on 2019 yields is available in Manitoba Agriculture's weekly [crop reports](#).

Feed shortages continue to be a concern. There are reports of more animals going to market than normal due to lack of available feed and many producers are looking at alternative feed sources for winter feed supply. Hay sampling and testing continue, with results indicating the presence of nitrates in some feeds affected by dry growing conditions. Producers that are feeding a variety of feed sources this year should [feed test](#) and have their rations balanced to meet livestock requirements.

Manitoba Agriculture and Resource Management's website has information and resources for producers on how to manage [crop](#) and [livestock](#) production during dry conditions. Producers looking for hay should see the [Manitoba Hay Listing Service](#). For fall and winter planning, see resources on [Managing Low Forage Supplies](#) and [Feed Plan Feed Ingredient Cost Calculator](#).

On September 12, 2019, government funding for water source development projects became available. Producers can inquire about the Water Source Development Program through [Ag Action Manitoba – Assurance: Beneficial Management Practices](#).

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>

### Environment and Climate Change Canada:

Flow and lake level information:

[http://www.wateroffice.ec.gc.ca/index\\_e.html](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/>