

# Water Availability and Drought Conditions Report

JULY 2019

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## Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for July 2019.
- Precipitation conditions over the past month, three month, and twelve month periods are as follows:
  - In July, most of southern Manitoba observed normal (85 to 115 % of median) to above normal (> 115 %) rainfall, with some regions of moderately dry (60 to 85 %) conditions in the areas surrounding Virden, Minitonas and Moosehorn, and severely dry (40 to 60 %) conditions surrounding McCreary. In northern Manitoba, moderately to severely dry conditions extended from Island Lake to Churchill and from Tadoule Lake to the northwest corner of the province.
  - Over the past three months (May, June, July), most of southern Manitoba observed moderately to severely dry precipitation conditions with a few isolated regions of normal conditions occurring in agro-Manitoba. In northern Manitoba, conditions were normal to above normal in the west and moderately to severely dry in the east.
  - Over the past 12 months, most of southern Manitoba and a portion of northeastern Manitoba observed moderately dry conditions, with pockets of severely dry conditions. The remainder of the province experienced normal conditions.
- Streamflows and lake levels increased during mid-July where significant rainfall events occurred. However, as of July 31, 2019, below normal (10<sup>th</sup> - 25<sup>th</sup> percentile) or much below normal (< 10<sup>th</sup> percentile) conditions were still observed on many rivers and lakes.
- Groundwater levels have increased in many areas with July rains and most groundwater levels from select monitoring wells are in the normal (25<sup>th</sup> - 75<sup>th</sup> percentile) range. The carbonate aquifer in the Steinbach area, southeast of Winnipeg and the Interlake areas are currently recording below normal (10<sup>th</sup> - 25<sup>th</sup> percentile) or much below normal (< 10<sup>th</sup> percentile) water levels.
- The July 31, 2019 Canadian Drought Monitor assessment shows improvement since June 30, with southwest and southeast agro-Manitoba considered free of any drought conditions. Abnormally dry conditions (D0) with pockets of moderate drought (D1) still exist across most of the northwest and Interlake regions and through a portion of the central region.
- There are currently no major concerns over reservoir water supplies.
- Livestock water supplies are variable across agro-Manitoba and are declining. There are reports of poor water quality in low dugouts, dried up dugouts, and water hauling to pasture troughs.
- Hay and forage yields are significantly below average across agro-Manitoba. On July 5, 2019, Manitoba Agriculture announced that livestock producers are allowed to apply for permits to temporarily cut hay and graze animals on Crown land not normally designated for agricultural use. Grasshoppers remain the main insect of concern, with monitoring on-going in all regions.
- Wildfires burned 101,408 hectares as of July 31, 2019, primarily in the northeastern and eastern regions. A full evacuation of the community of Marcel Colomb First Nation was completed as a result of the loss of the main power line feeding the community. The Canadian Red Cross has begun the process of returning residents back to the community.
- Environment and Climate Change Canada's seasonal forecast for August-September-October predicts temperatures will be above normal across Manitoba. Precipitation is forecasted to be normal.

## 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.

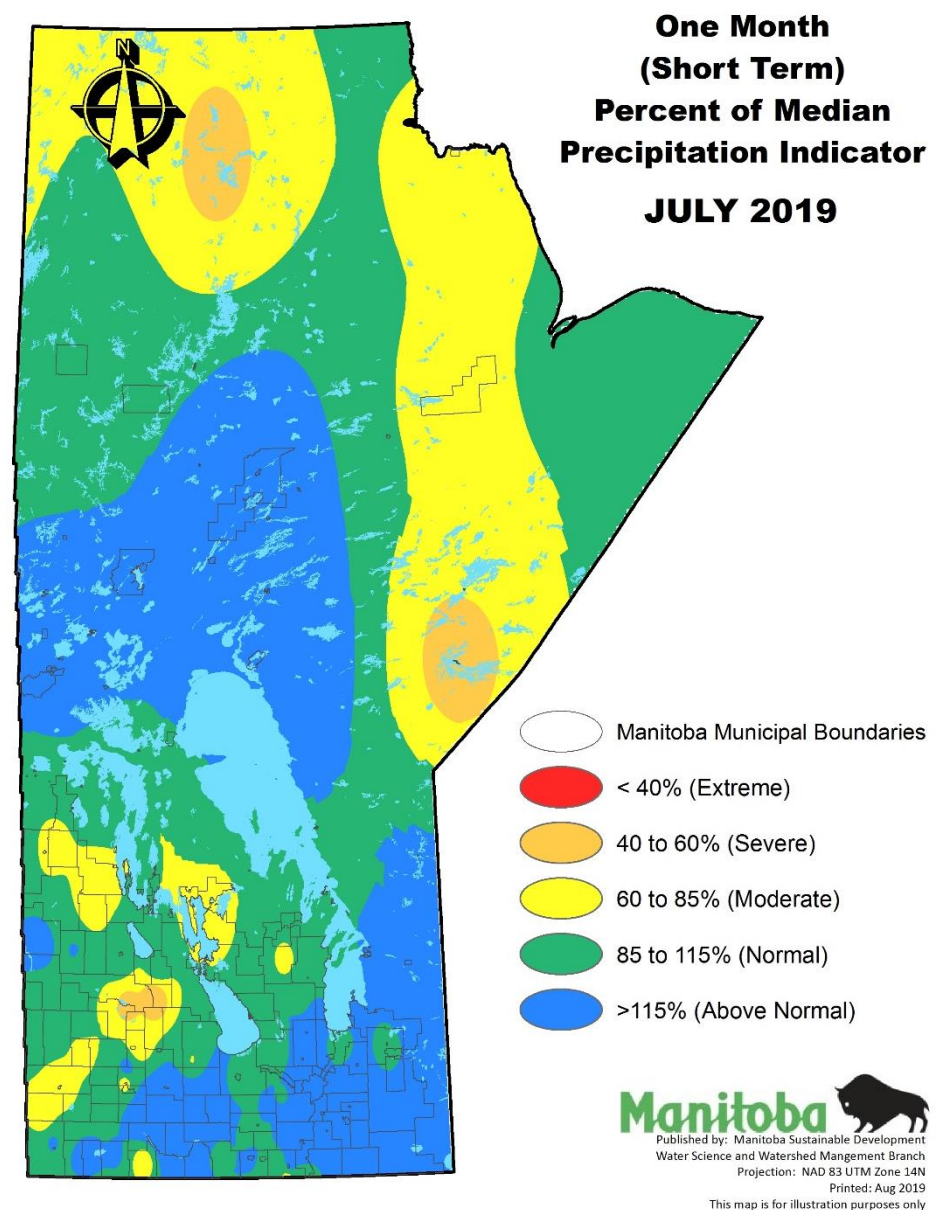


Figure 1: One month (short term) per cent of median precipitation indicator.

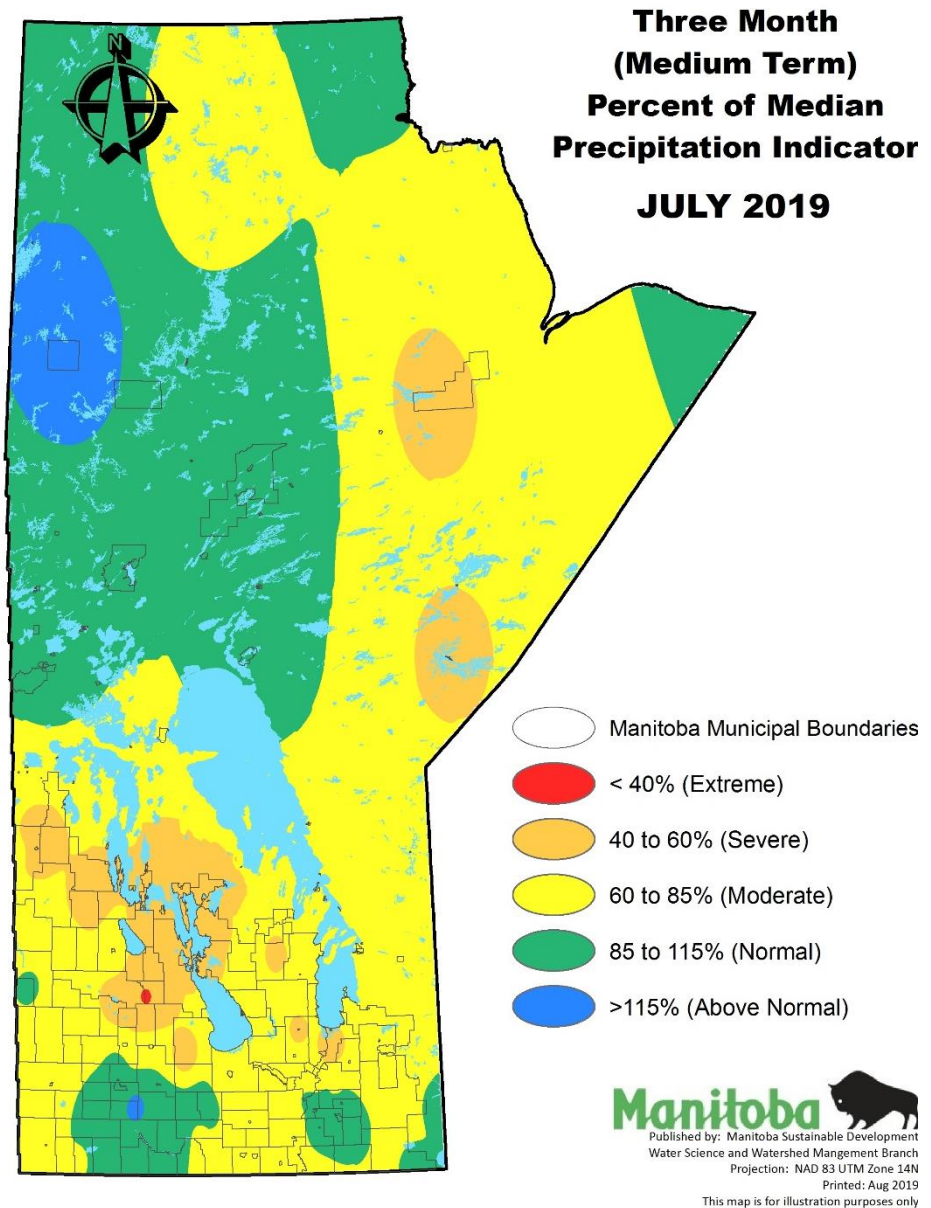


Figure 2: Three month (medium term) per cent of median precipitation indicator.

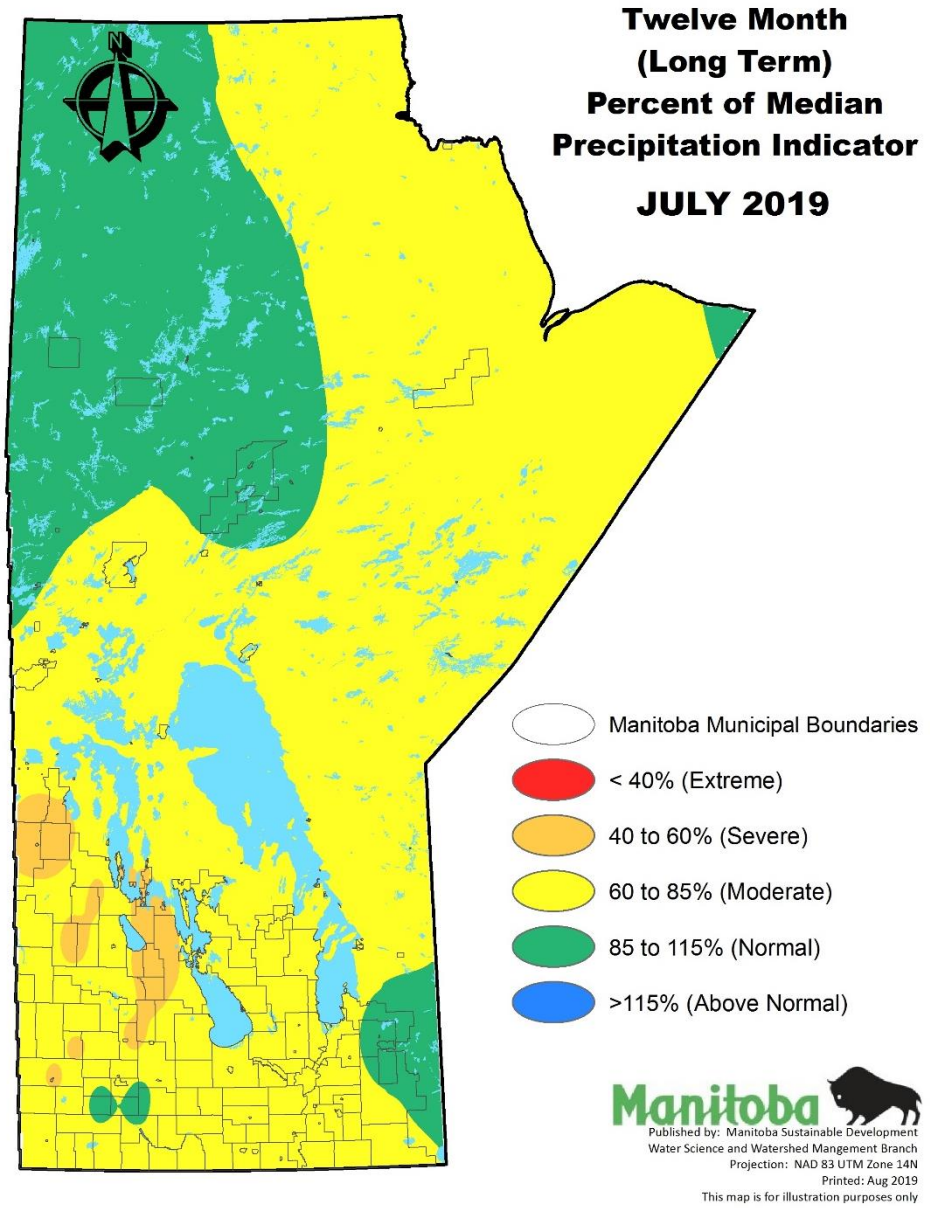


Figure 3: Twelve month (long term) per cent of median precipitation indicator.

### 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 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.

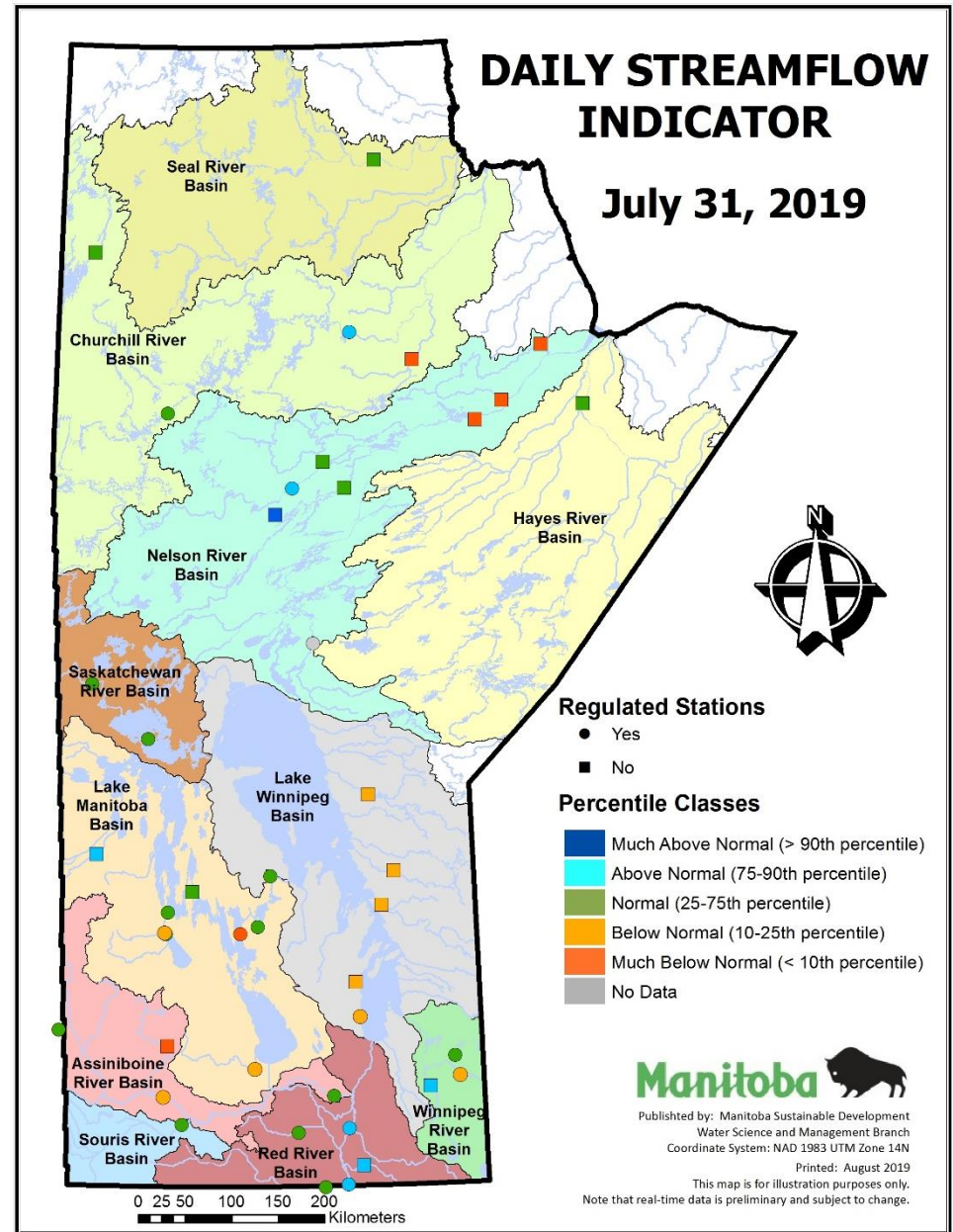


Figure 4: Daily streamflow and lake level indicator for July 31, 2019.

## 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.

In many areas, water levels have responded to July rains. The only site to change percentile ranking is in the Anola area in which the water level has increased enough to now place it near the base of the normal ranking. The Steinbach area wells have responded to July rains but still remain in the much below normal range. Much of the southeast carbonate aquifer water levels are below the normal range. The water levels at the remaining sites remain in the normal to above normal ranges.

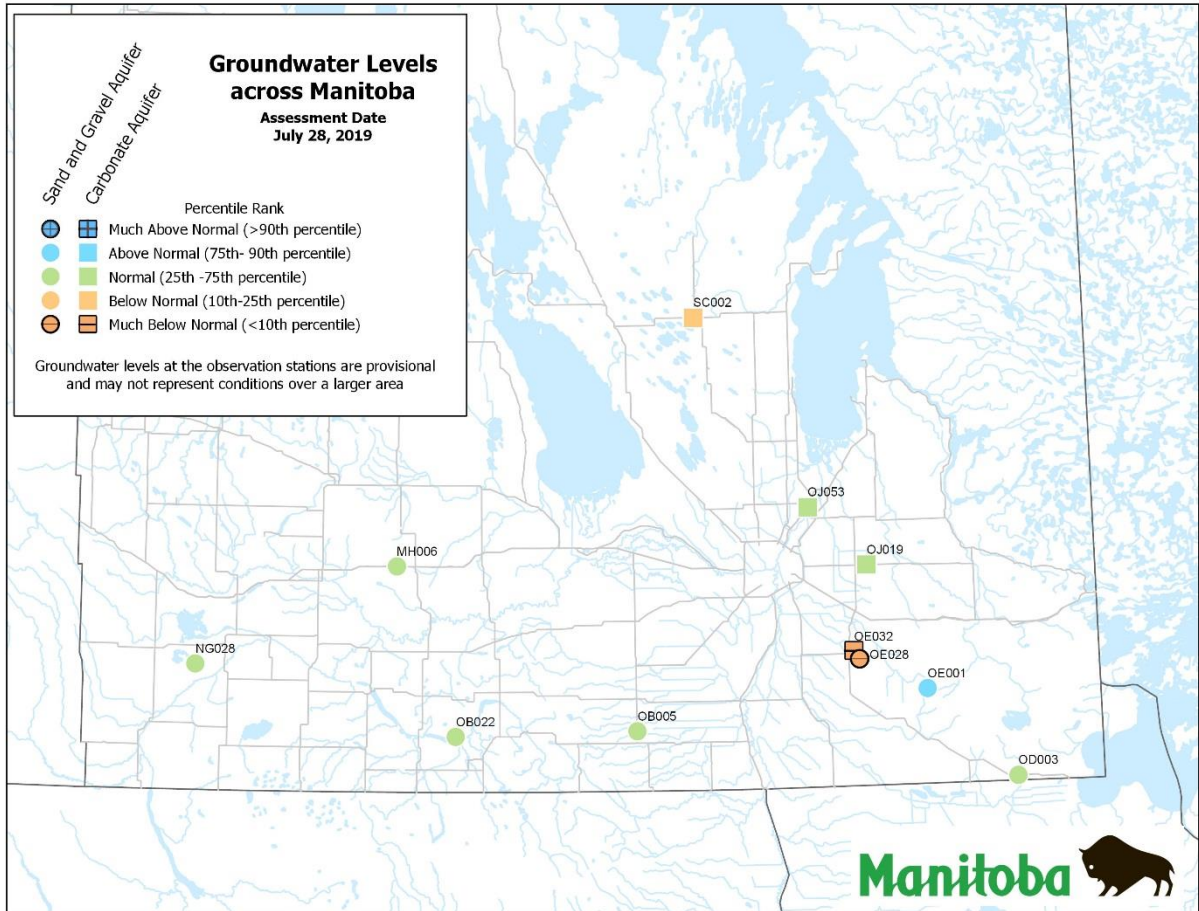


Figure 5: Groundwater indicator on July 28, 2019 for select groundwater monitoring sites.

## 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).

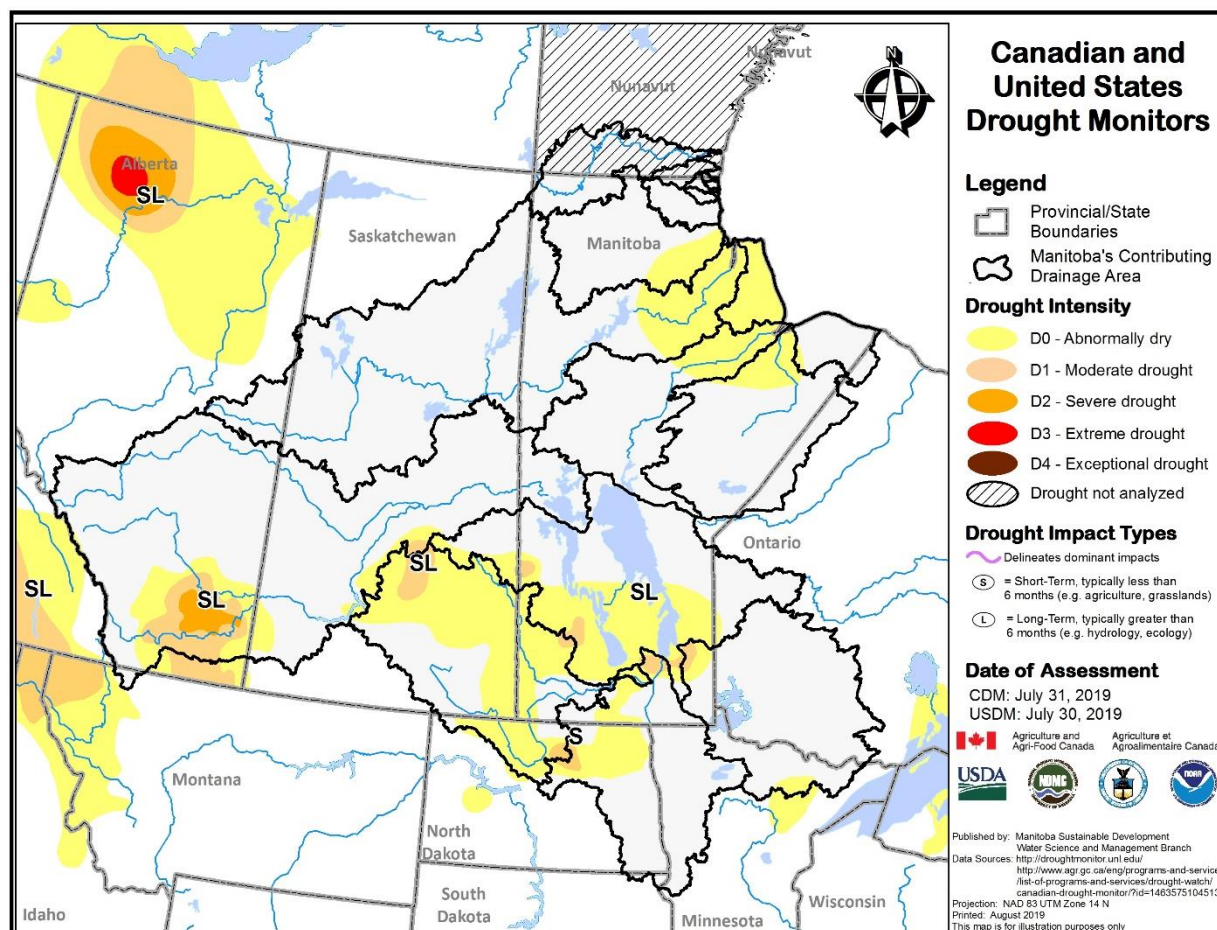


Figure 6: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of July 31, 2019.

## Water Availability

### Reservoir Conditions

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

Table 1: Water Supply Reservoir Levels and Storages – July 31, 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>	1401.43	July 30, 2019	-1.07	300,000	286,831	96%
Lake Wahtopanah (Rivers)*	Rivers	1,536	1535.24	July 31, 2019	-0.76	24,500	23,666	97%
Minnewasta (Morden)*	Morden	1,082	1080.43	July 31, 2019	-1.57	3,150	2,890	92%
Stephenfield*	Carman, Pembina Valley Water Co-op	972	972.08	July 31, 2019	0.08	3,810	3,846	101%
Vermilion*	Dauphin	1,274	1270.88	July 31, 2019	-3.12	2,600	1,780	68%
Goudney (Pilot Mound)*		1,482	1482.20	July 31, 2019	0.20	450	460	102%
Jackson Lake*		1,174	1172.37	July 31, 2019	-1.63	2,990	2,581	86%
Manitou (Mary Jane)*		1,537	1536.56	July 31, 2019	-0.44	1,150	1,111	97%
Turtlehead (Deloraine)*	Deloraine	1,772	1771.71	July 31, 2019	-0.29	1,400	1,386	99%
Rapid City*		1,573.5	1572.97	July 31, 2019	-0.53	200	163	82%
Kenton Reservoir		1,448	1447.64	June 5, 2019	-0.36	600	573	95%
Killarney Lake		1,615	1615.06	July 11, 2019	0.06	7,360	7,388	100%
Lake Irwin		1,178	1177.41	July 31, 2019	-0.59	3,800	3,445	91%
Elgin		1,532	1532.29	June 26, 2019	0.29	520	540	104%
St. Malo		840	840.78	July 15, 2019	0.78	1,770	1,898	107%
Minnedosa		1,682	1682.18	June 5, 2019	0.18	1,688	1,735	103%
Boissevain	Boissevain	1,697	1697.89	June 24, 2019	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’s Crop Report Issue 14 (published on July 30, 2019) are provided in Table 2.

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

Region	General Dugout Condition
Eastern	Availability of livestock water is rated as 100 % adequate.
Interlake	Water supply is rated as 50 to 60 % adequate, but significant rain is needed for replenishment. Dugout levels are quite variable; all are declining, some are dry. Water quality is a concern in low dugouts. Water hauling to pasture troughs is becoming more common in the north Interlake. Some wells are being drilled deeper.
Southwest	Dugouts are about 60 % full with some producers hauling water as sloughs dry out.
Central	Livestock water supplies are getting lower, affecting water quality and dugouts are running out of water.
Northwest	Dugouts are low in the McCreary, Alonsa, Ste. Rose, Dauphin, Rorketon, Crane River and Ethelbert areas and many have dried up completely.

## Soil Moisture

Manitoba Agriculture’s mapping of topsoil (0 – 30 cm) conditions for July 29, 2019 showed that most areas are at optimal soil moisture condition except the Interlake which is mostly dry. The 0 – 120 cm Soil Moisture Map shows a similar soil moisture pattern which is mostly at optimal level across agro-Manitoba with a decrease in the dry conditions in the Interlake.

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).

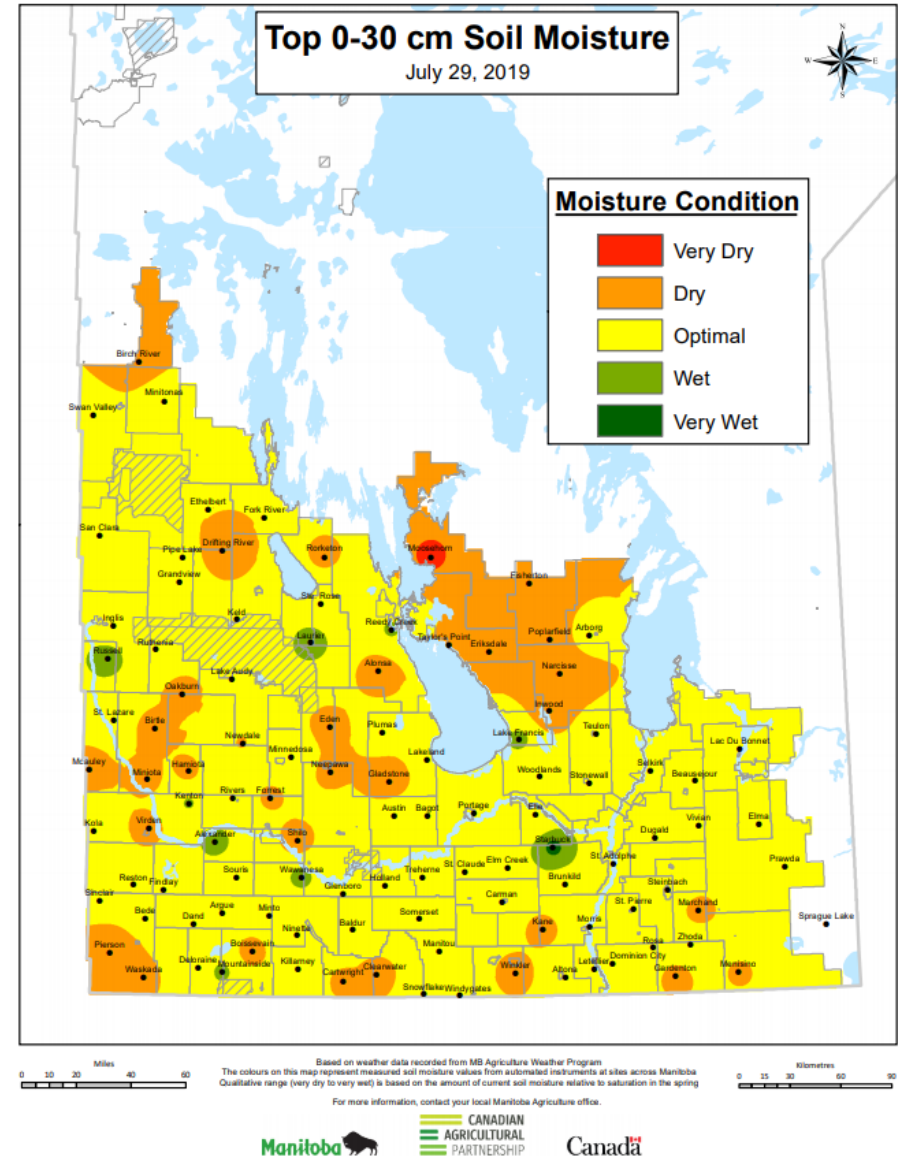


Figure 7: Manitoba Agriculture’s July 29, 2019 mapping of soil moisture conditions in the top 0 – 30 cm.



## Wildland Fires

As of July 31, 2019, the Manitoba Sustainable Development Wildfire Program reported 243 wildfires have occurred during the 2019 fire season, which is about 70 % of average for this time of year. A total of 101,408 hectares have been burned to date. Approximately 68 % of the burned area is located in the northeast region, 23 % in the eastern region and the remainder in the central region.

As of July 31, 2019, fire danger levels across the western and northern regions of the province were low to moderate while fire danger levels in the central and eastern regions continued to climb (Figure 8).

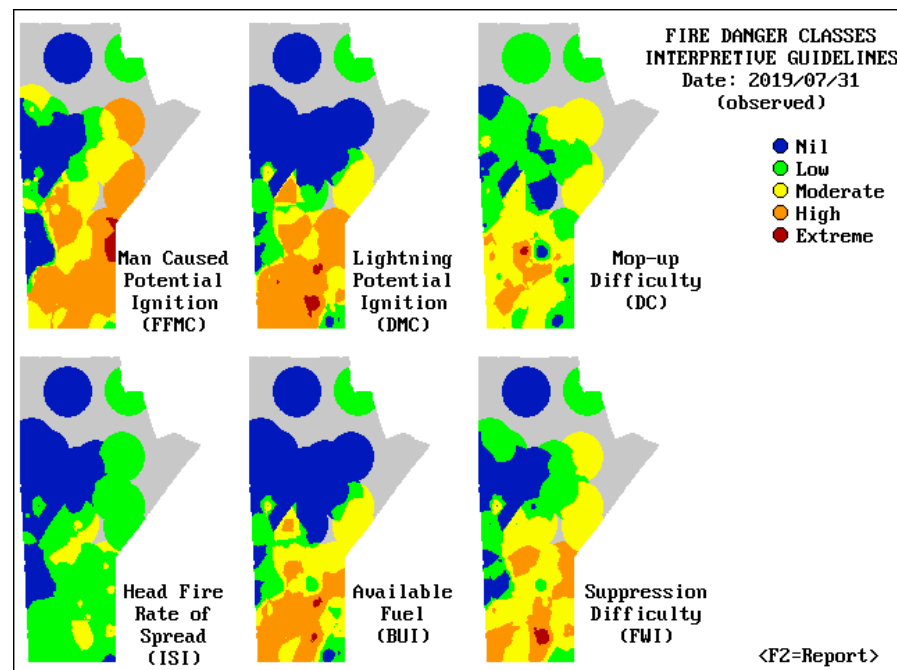


Figure 8: Fire danger mapping by the Manitoba Sustainable Development Wildfire Program.

## Impacts due to Dry Conditions

As of July 31, Manitoba Sustainable Development Wildfire Program staff continued to action several wildfires near the communities of Lynn Lake and Marcel Colomb First Nation. All active fires in proximity to the communities were either extinguished, brought under control or were being held. A full evacuation of the community of Marcel Colomb First Nation was completed as a result of the loss of the main power line feeding the community. In total, 152 individuals were evacuated. Power has since been restored to the community and the Canadian Red Cross has begun the process of returning residents back to the community.

As of July 31, 2019, there were no provincial fire or travel restrictions in place. However, municipal burning restrictions were in place for [nine municipalities](#) across southern Manitoba due to the dry conditions.

Manitoba Agriculture's Crop Report Issue 14 indicated that hay and forage yields are significantly below average, with shortages most severe in the Interlake region. On July 5, 2019, Manitoba Agriculture announced that livestock producers are allowed to apply for permits to temporarily cut hay and graze animals on Crown land not normally designated for agricultural use.

Pest species of grasshoppers tend to increase rapidly during years of warm, dry weather, and have become the main insect of concern across agro-Manitoba. Monitoring is on-going in all regions.

Manitoba Agriculture'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](#).

## Future Weather

Environment and Climate Change Canada's seasonal forecast for the next three months (August-September-October) predicts temperatures will be above normal across Manitoba. Precipitation over the next three months is forecasted to be normal across the province.

The National Oceanic and Atmospheric Administration indicated that El Niño conditions are currently present. They expect a transition from El Niño to ENSO-neutral to occur within the next month or two, with ENSO-neutral most likely to continue through the Northern Hemisphere fall and winter.

**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 and Drought Management Engineer  
Surface Water Management Section, Water Science and Watershed Management Branch, Manitoba Sustainable Development  
Box 14, 200 Saulteaux Crescent, Winnipeg, Manitoba R3J 3W3  
Ph. (204) 806-4557, Fax (204) 945-7419, E-mail  
[Carly.Delavau@gov.mb.ca](mailto:Carly.Delavau@gov.mb.ca)

## Acknowledgements

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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](http://www.wateroffice.ec.gc.ca/index_e.html)

Three month climatic outlook:

[http://weatheroffice.gc.ca/saisons/index\\_e.html](http://weatheroffice.gc.ca/saisons/index_e.html)

**Manitoba Sustainable Development's Fire Program:**

<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>

**Canadian Drought Monitor:** <http://www.agr.gc.ca/drought>

**United States Drought Monitor:** <https://droughtmonitor.unl.edu/>

**National Oceanic and Atmospheric Administration:** ENSO

Status Update:

[http://www.cpc.ncep.noaa.gov/products/analysis\\_monitoring/lanina/enso\\_evolution-status-fcsts-web.pdf](http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf)