

Water Availability and Drought Conditions Report

JUNE 2019 - EXECUTIVE SUMMARY

- Precipitation conditions over the past month, three month, and twelve month periods are as follows:
 - In June, most of southern Manitoba observed moderately (60 to 85 % of median) to severely (40 to 60 % of median) dry precipitation conditions, with some regions of extremely dry conditions (< 40 % of median) surrounding Swan River and Selkirk. The southwest corner saw normal (85 to 115 % of median) to above normal (> 115 % of median) precipitation during this period. Conditions in northern Manitoba ranged from normal to above normal in the west and moderately to severely dry in the east.
 - Over the past three months (April, May, June), most of southern Manitoba observed moderately to severely dry precipitation conditions with some isolated regions of extremely dry conditions surrounding Ste. Rose, Teulon, and Selkirk. Conditions in northern Manitoba ranged from 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.
- As of July 3, 2019, below normal (10th - 25th percentile) or much below normal (< 10th percentile) streamflows and lake levels were observed on many rivers and lakes across Manitoba. Flows receded faster than normal after the spring freshet due to dry conditions.
- Many aquifers had little to no recharge during the spring of 2018 resulting in lower water levels which carried into 2019. Spring recharge was variable and below normal in many areas. Currently, aquifers in the Steinbach area are in the much below normal range, the carbonate aquifer in the Anola and Poplarfield areas is slightly below the normal range, whereas other aquifer water levels are in the normal to above normal range.
- The June 30, 2019 Canadian Drought Monitor assessment showed improved conditions in the southwest corner of agro-Manitoba, but an expanded region of moderate drought (D1) in the Interlake, central region and a portion of the eastern region. Severe drought (D2) conditions extended from McCreary to Ashern, Winnipeg to Selkirk, and the areas surrounding Swan River and Lundar. A small pocket of extreme drought (D3) is centered over Ste. Rose.
- There are currently no major concerns over reservoir water supplies. Shellmouth Reservoir is near the lower end of the summer target range and outflow from the dam is at the minimum target outflow as defined in the Shellmouth Operating Guidelines. Conditions in the upper Assiniboine River basin have been dry and the Shellmouth Reservoir and the Assiniboine River are being closely monitored.
- Although livestock water supply is generally considered to be adequate, dugout levels in regions without adequate rainfall are classified as low or below normal and in some cases are dry. Precipitation is needed to recharge water supplies to last the grazing season, stimulate pasture growth and maintain crop condition and yield potential. Poor first cut hay and alfalfa yields were reported across the province.
- Wildfires burned 54,734 hectares as of July 3, 2019, primarily in the northeastern region. Municipal burning restrictions are in place for 14 municipalities across southern Manitoba due to the dry conditions.
- Environment and Climate Change Canada's seasonal forecast for July-August-September predicts temperatures will be above normal across most of 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.

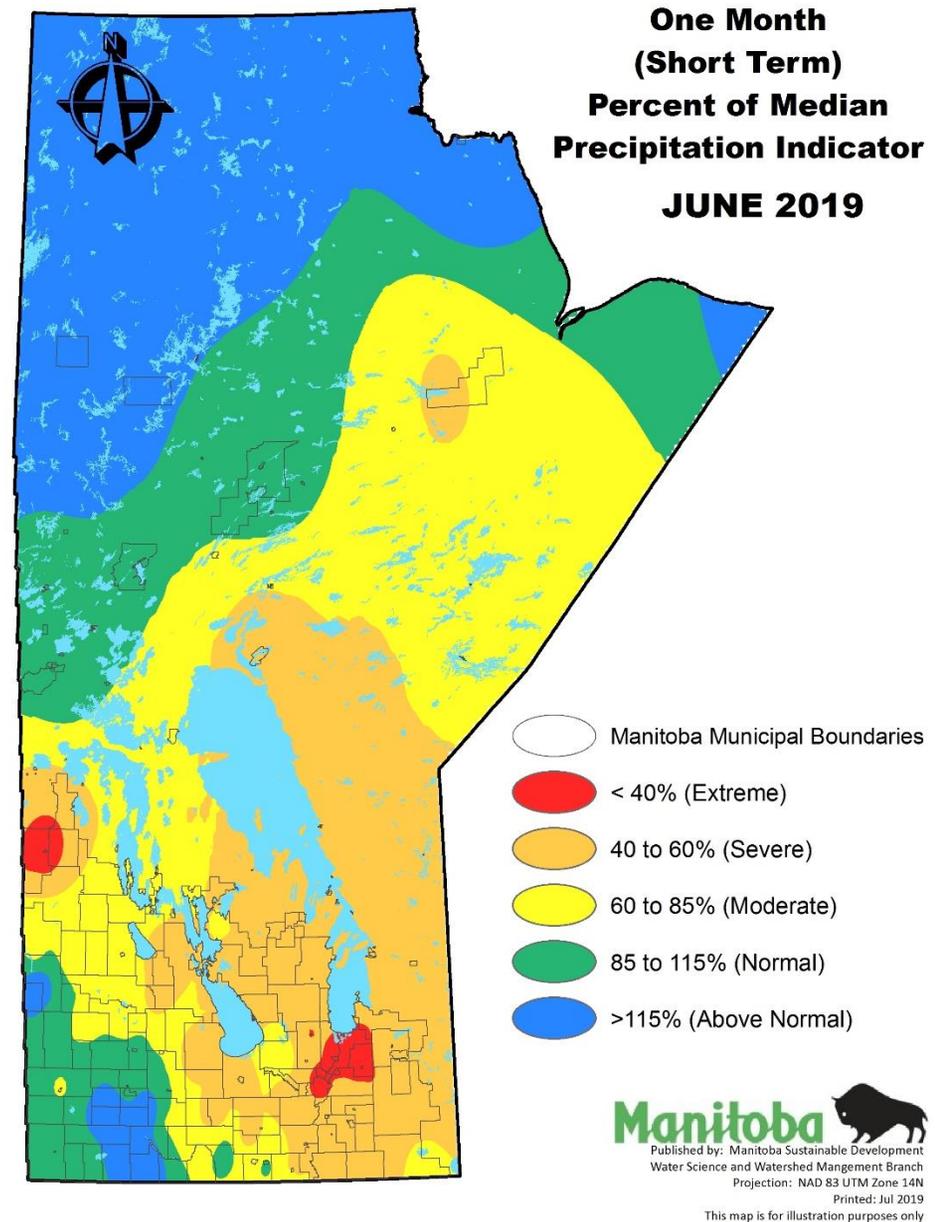


Figure 1: One month (short term) per cent of median precipitation indicator.

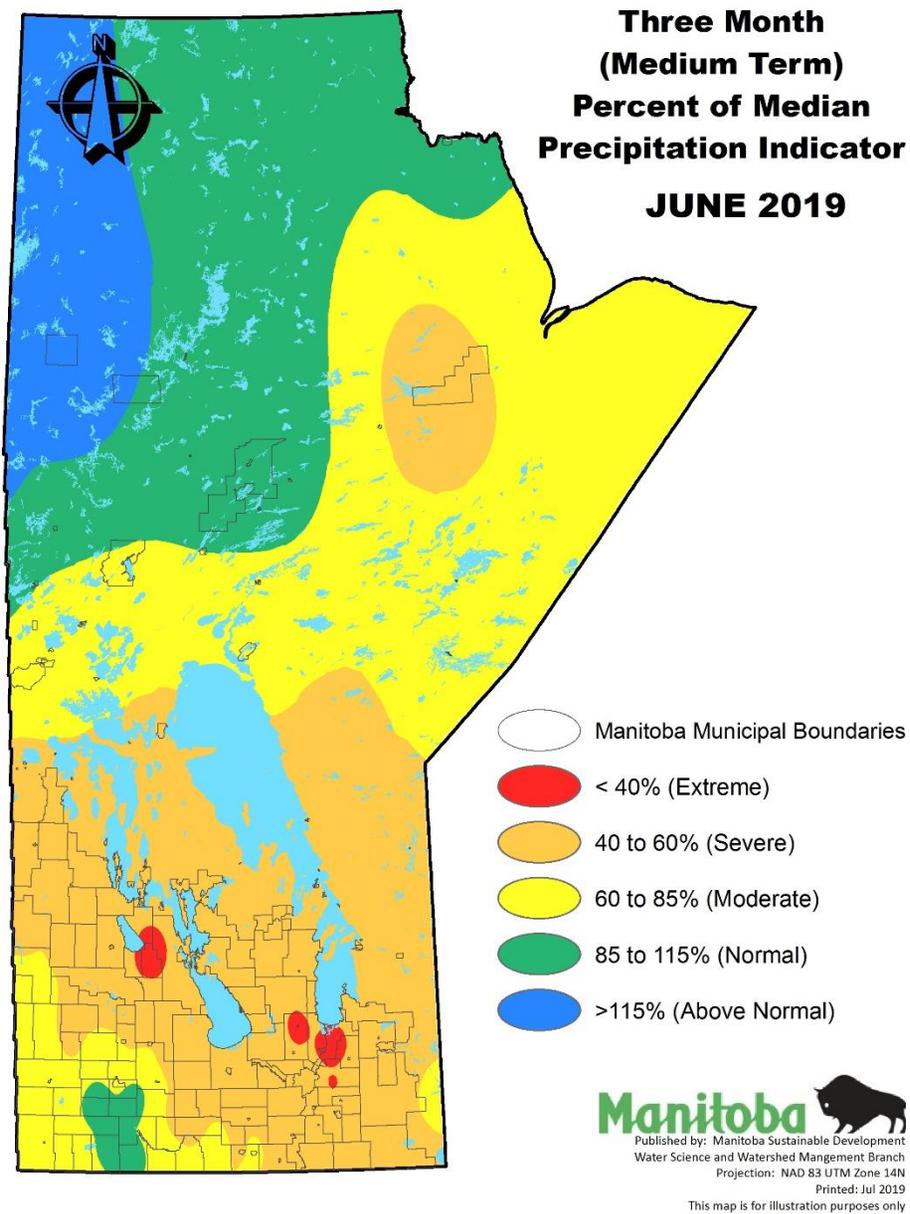


Figure 2: Three month (medium term) per cent of median precipitation indicator.

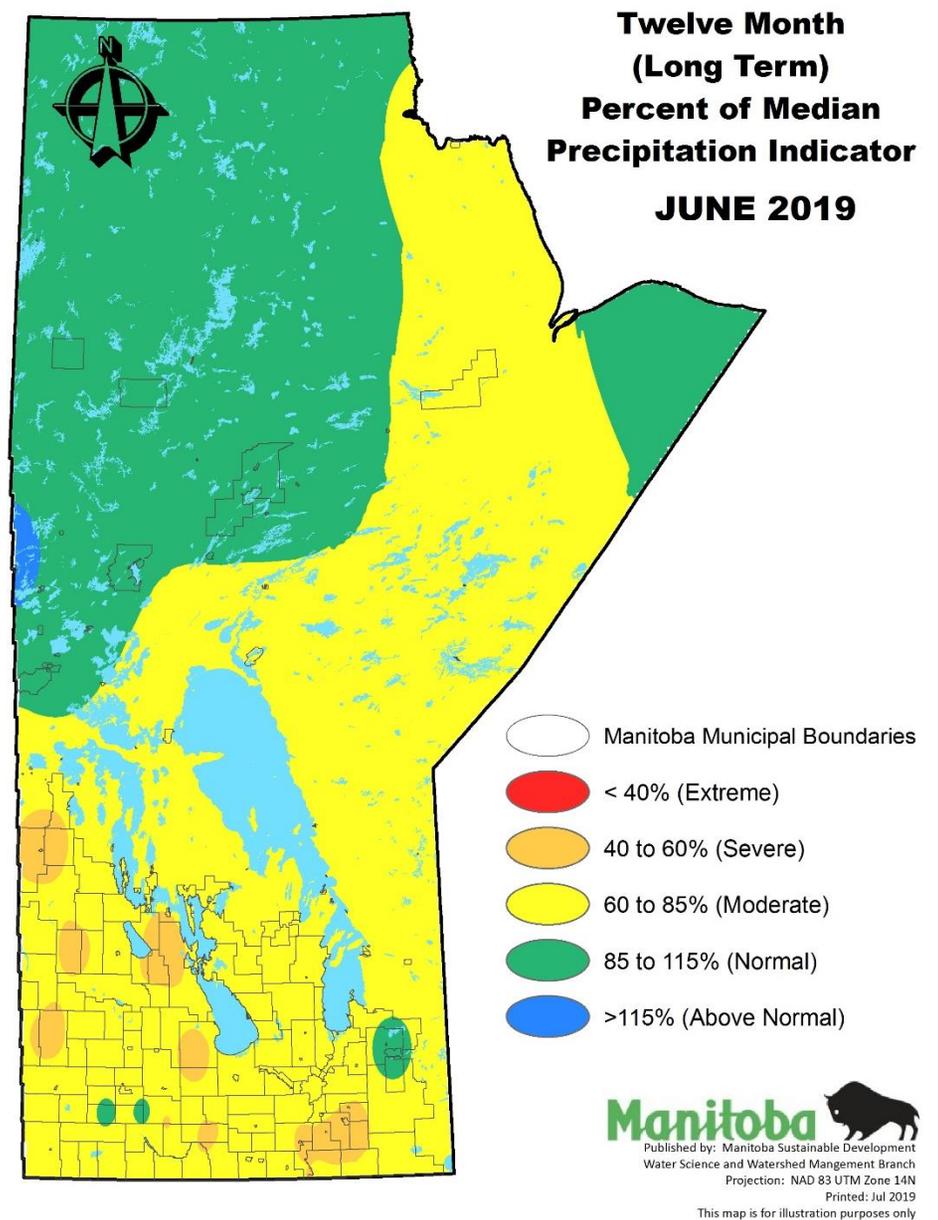


Figure 3: Twelve month (long term) per cent of median precipitation indicator.

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 2, 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.

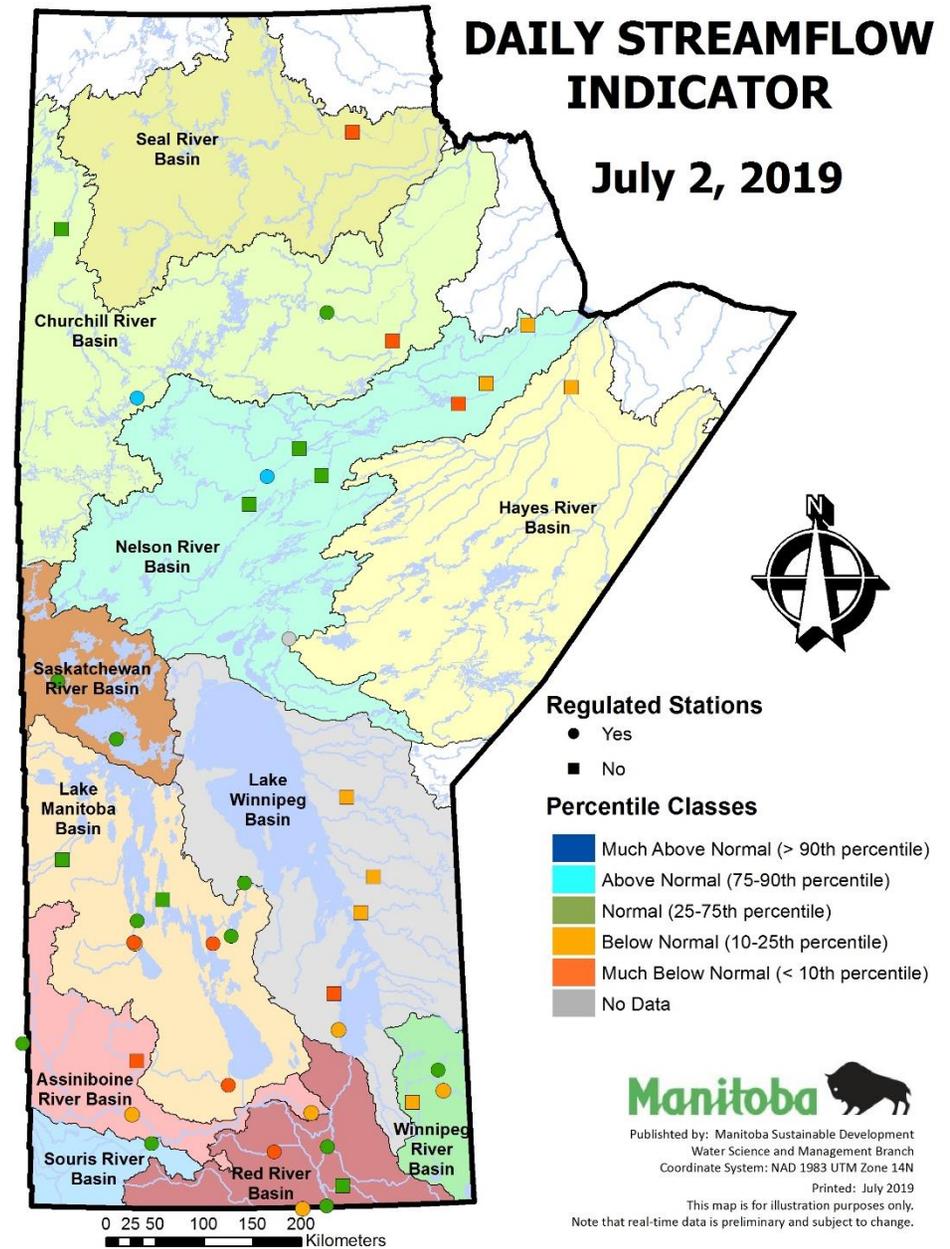


Figure 4: Daily streamflow and lake level indicator for July 2, 2019.

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.

Spring recharge to date has been quite variable with many areas experiencing below normal amounts. The water level status (percentile rankings) for July 1, 2019 has not changed from the beginning of June. Currently, aquifers in the Steinbach area (OE032 & OE028; Figure 5) are in the much below normal range and are currently setting new record low levels. The carbonate aquifer in the Anola (OJ019) and Poplarfield (SC002) areas is slightly below the normal range, whereas other aquifer water levels are in the normal to above normal range.

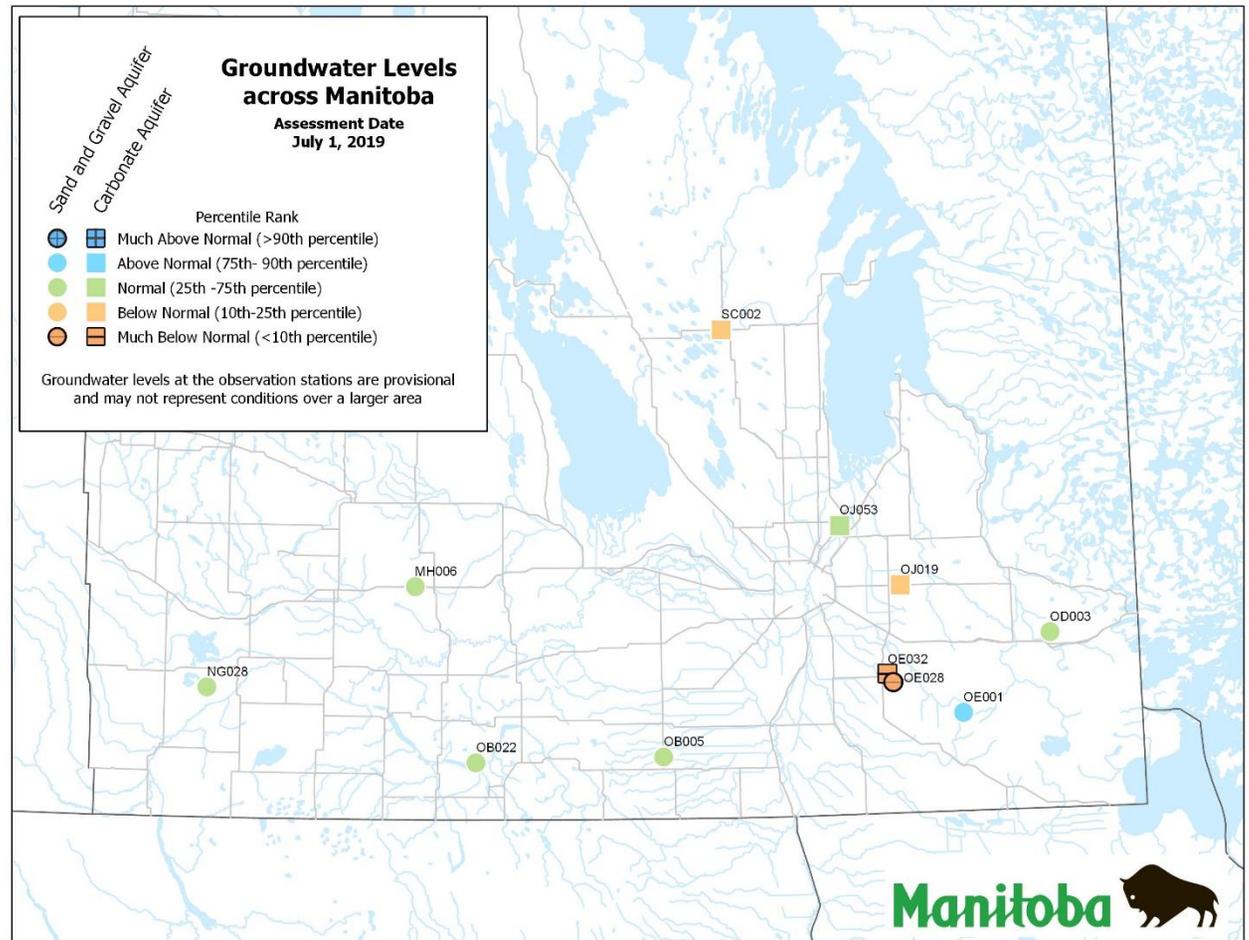


Figure 5: Groundwater indicator on July 1, 2019 for select groundwater monitoring sites.

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).

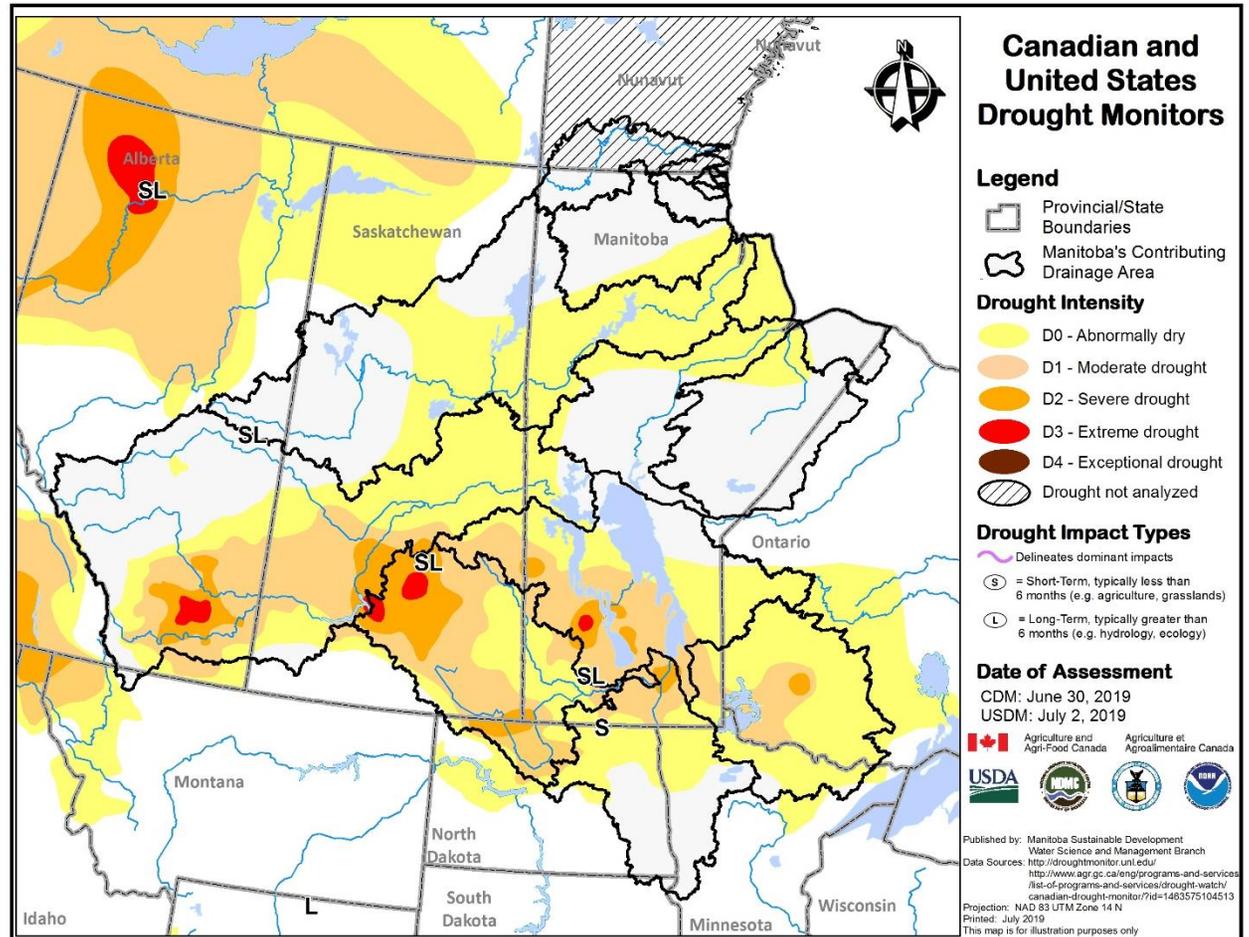


Figure 6: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of June 30, 2019.

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. Due to dry conditions in the Saskatchewan portion of the Assiniboine River Basin, Shellmouth Reservoir is near the lower end of the summer target range (1400 to 1404 feet) and outflow from the dam is at the minimum target outflow of 50 cfs, as defined in the Shellmouth Operating Guidelines. Shellmouth Reservoir and downstream flows along the Assiniboine River are being closely monitored, and any concerns from water users are being discussed through the Shellmouth Dam Liaison Committee.

Table 1: Water Supply Reservoir Levels and Storages – July 3, 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) ^{1*}	Brandon, Portage, Cartier Regional Water Co-op	1,402.5 ¹	1401.60	July 3, 2019	-0.90	300,000	288,923	96%
Lake Wahtopanan (Rivers)*	Rivers	1,536	1536.15	July 3, 2019	0.15	24,500	24,831	101%
Minnewasta (Morden)*	Morden	1,082	1080.92	July 3, 2019	-1.08	3,150	2,971	94%
Stephenfield*	Carman, Pembina Valley Water Co-op	972	971.55	July 3, 2019	-0.45	3,810	3,599	94%
Vermilion*	Dauphin	1,274	1271.45	July 3, 2019	-2.55	2,600	1,930	74%
Goudney (Pilot Mound)*		1,482	1482.26	July 3, 2019	0.26	450	463	103%
Jackson Lake*		1,174	1172.64	June 25, 2019	-1.36	2,990	2,649	89%
Manitou (Mary Jane)*		1,537	1536.24	July 3, 2019	-0.76	1,150	1,082	94%
Turtlehead (Deloraine)*	Deloraine	1,772	1771.78	July 3, 2019	-0.22	1,400	1,389	99%
Rapid City*		1,573.5	1573.40	July 3, 2019	-0.10	200	193	96%
Kenton Reservoir		1,448	1447.64	June 5, 2019	-0.36	600	573	95%
Killarney Lake		1,615	1614.70	May 9, 2019	-0.30	7,360	7,220	98%
Lake Irwin		1,178	1177.91	June 26, 2019	-0.09	3,800	3,746	99%
Elgin		1,532	1532.29	June 26, 2019	0.29	520	540	104%
St. Malo		840	840.50	April 11, 2019	0.50	1,770	1,852	105%
Minnedosa	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%

¹ 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 10 (published on July 2, 2019) are provided in Table 2.

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

Region	General Dugout Condition
Eastern	Availability of livestock water rated as 100 % adequate.
Interlake	Dugout levels are quite variable; all are declining, some are dry. Water supply is rated as 90% adequate, but significant rain is needed for replenishment. Water hauling has not yet been reported.
Southwest	Dugout levels range from low to adequate.
Central	Livestock water supplies are adequate in the western side of the region but more of an issue in the southeastern parts.
Northwest	Dugouts have been reported to be 50% of normal to dry in the Rorketon area. Producers are digging wells to supplement water sources for cattle on pasture.

Soil Moisture

Manitoba Agriculture’s mapping of topsoil (0 – 30 cm) conditions for July 1, 2019 showed that most areas were at optimal soil moisture except the Interlake region which was dry (Figure 7). Soil moisture data for 0 – 120 cm also showed that soil moisture was mostly at optimal level across agro-Manitoba with localized areas showing wet (Killarney, Snowflake, Rivers, Kenton, Russell and Elma) or dry (Eden, Pierson, Gardenton, Menisino, Marchand, Narcisse and Moosehorn) 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).

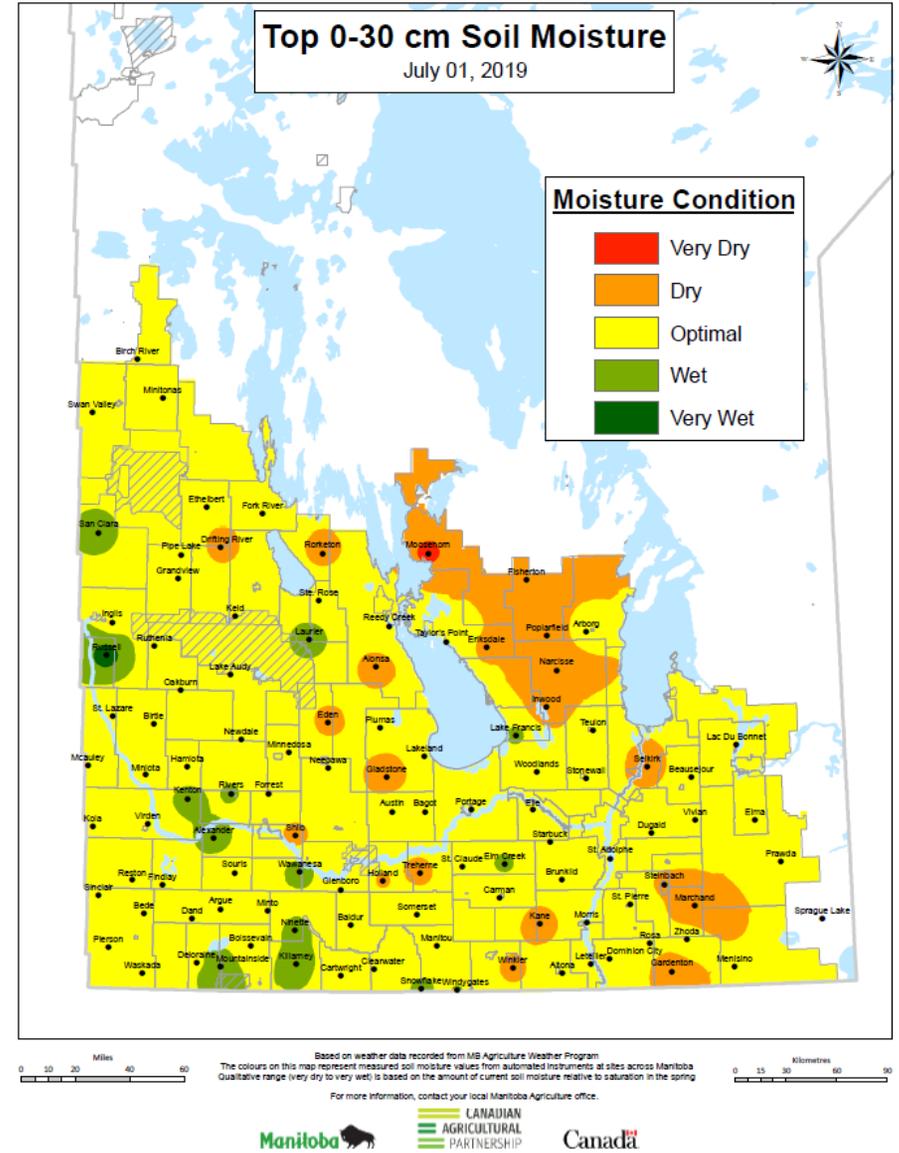


Figure 7: Manitoba Agriculture’s July 1, 2019 mapping of soil moisture conditions in the top 0 – 30 cm.

Wildland Fires

As of July 3, 2019 the Provincial Wildfire Program reported 171 wildfires have occurred during the 2019 fire season, burning a total of 54,734 hectares. Approximately 78 % of the burned area is located in the northeast region, with the remainder located in the central and eastern regions.

As of July 3, 2019, fire danger (Figure 8) is low in northern Manitoba but moderate to high throughout much of southern Manitoba, with the highest fire activity observed east of Lake Winnipeg, and in the Gods Lake and Island Lake areas.

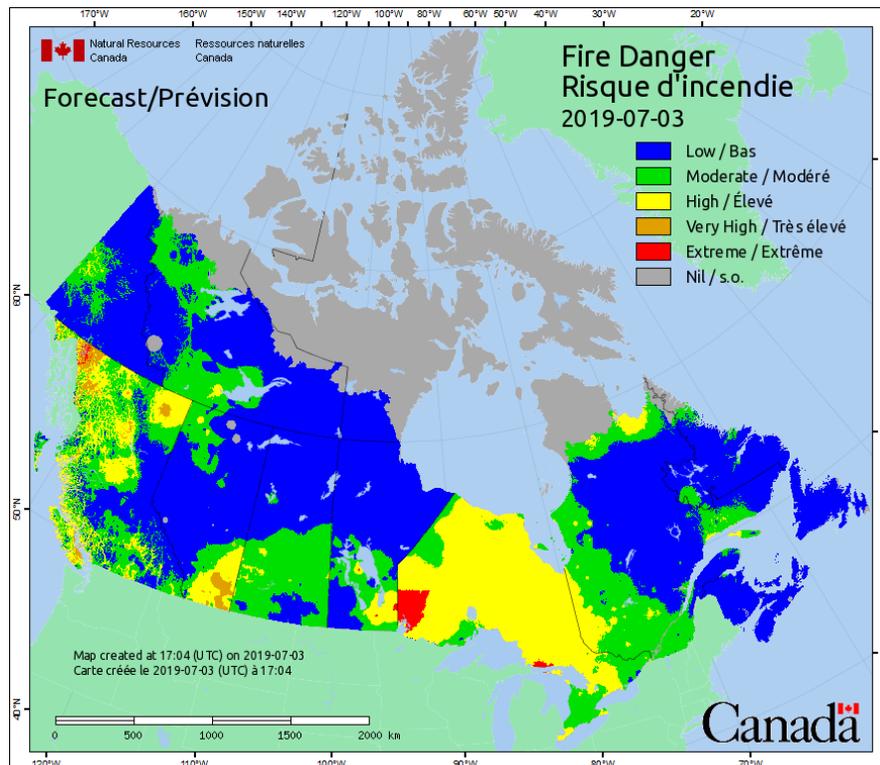


Figure 8: Fire danger mapping by Natural Resources Canada.

Impacts due to Dry Conditions

Provincial fire crews are focusing their efforts on fires affecting communities including fires near the communities of Poplar River, Red Sucker Lake, Little Grand Rapids and Gods Lake Narrows. While these fires are not threatening any communities, smoke will drift into the communities based on wind direction. As of July 3, 2019, there were no provincial fire or travel restrictions in place. However, municipal burning restrictions were in place for [14 municipalities](#) across southern Manitoba due to the dry conditions.

Manitoba Agriculture's July 2 Crop Report reported that eastern Manitoba, the Red River Valley and the Interlake have experienced a lack of adequate rainfall, while other areas further west have benefitted from rainfall, with some exceptions. Impacts to crops in areas not receiving adequate rainfall are becoming more evident. Poor first cut hay and alfalfa yields have been reported across the province. Concerns have shifted to short annual crop growth as a potential livestock feed source.

Manitoba Agriculture's website has information and resources for producers on how to manage [crop](#) and [livestock](#) production during dry conditions.

Future Weather

Environment and Climate Change Canada's seasonal forecast for the next three months (July-August-September) predicts temperatures will be above normal across most of 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. There is a 66 % chance that El Niño will continue through the Northern Hemisphere summer 2019 and into the fall (50 – 55 % chance).

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

Three month climatic outlook:

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