Water Availability and Drought Conditions Report

AUGUST 2018

Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for August 2018.
- August precipitation was below normal across most of Manitoba and most areas, particularly agro-Manitoba, need additional rainfall.
  - In August, portions of the Interlake and the northwest and northeast corners of the province observed normal or above normal (85 to 115 % of median) precipitation. The rest of the province experienced varying degrees of dryness. Northwest and central regions of agro-Manitoba observed extremely (<40 % of median) dry conditions.
  - Over the past three months, most of southern Manitoba observed moderately dry conditions. The western edge of the province and northern Manitoba experienced normal or above normal rainfall during this period.
  - Over the past 12 months, most of southern Manitoba observed moderately dry conditions, with pockets of severely dry conditions. The remainder of the province experienced normal or above normal precipitation conditions during this period.
- As of August 29, 2018, below normal (10^{th} - 25^{th} percentile) or much below normal (< 10^{th} percentile) streamflows were observed on the Pembina, Qu'Appelle, Mossy, Little Saskatchewan, Whitemud, Winnipeg, Whitemouth and Bloodvein rivers. Below normal or much below normal water levels were observed on Dauphin Lake, Lake Winnipeg, Lake Manitoba, and Round Lake.
- Groundwater levels in major aquifers are generally in the normal range. However, water levels in the Carbonate Aquifer near Anola continue to be below normal (10^{th} - 25^{th} percentile) during August 2018.
- The Canadian Drought Monitor classified southern Manitoba as D1 (moderately dry conditions) with pockets of D2 (severe drought) conditions as of August 31, 2018. D0 (abnormally dry) conditions are located in a band along the northern edge of the D1 conditions.
- There are currently no major concerns over reservoir water supplies. However, a few reservoirs such as Stephenfield Reservoir and Jackson Lake are being closely monitored. Manitoba Agriculture stated that dugout levels are very low across most of agro-Manitoba. Livestock are being moved to alternate water sources or water is being brought in.
- Wildfires burned ~55,000 hectares during the month of August, primarily in northeastern and eastern Manitoba. Due to elevated wildfire danger, there was a backcountry fire ban in place for Spruce Woods Provincial Park.
- Manitoba Agriculture is reminding livestock producers that there are provincial services available to help manage feed shortages. Producers can contact Manitoba Agriculture toll-free at 1-844-769-6224 or visit www.gov.mb.ca/agriculture for more information.
- Environment and Climate Change Canada's seasonal forecast for September-October-November projects temperatures to be above normal and precipitation to be in the normal range.

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.

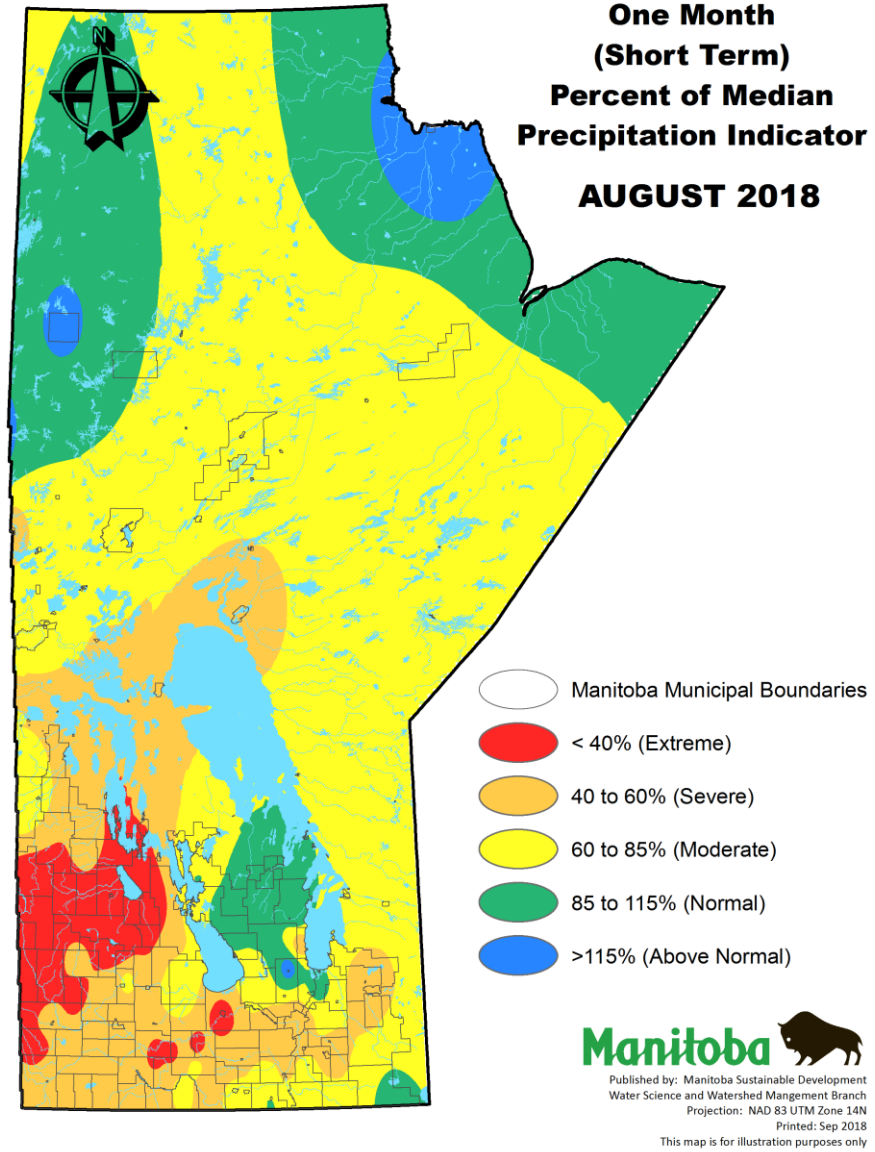


Figure 1: Short term (one month) per cent of median precipitation indicator.

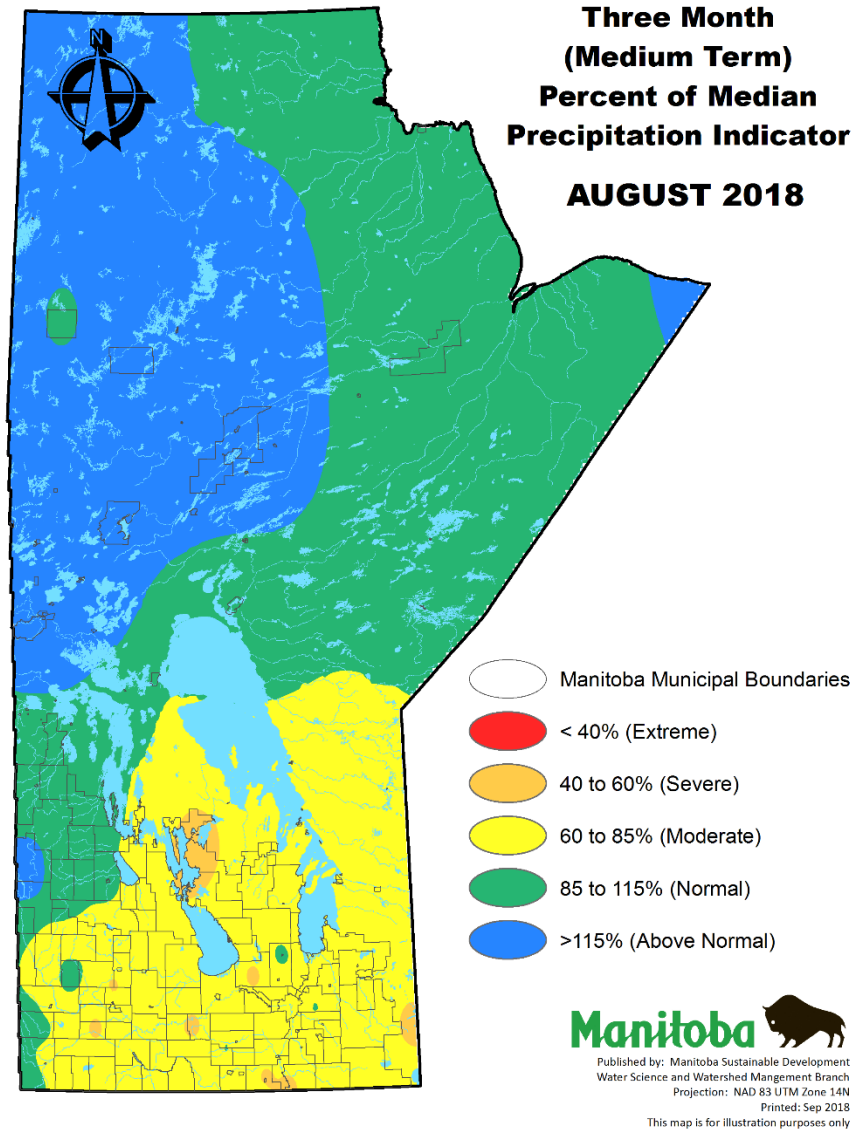


Figure 2: Medium term (three month) per cent of median precipitation indicator.

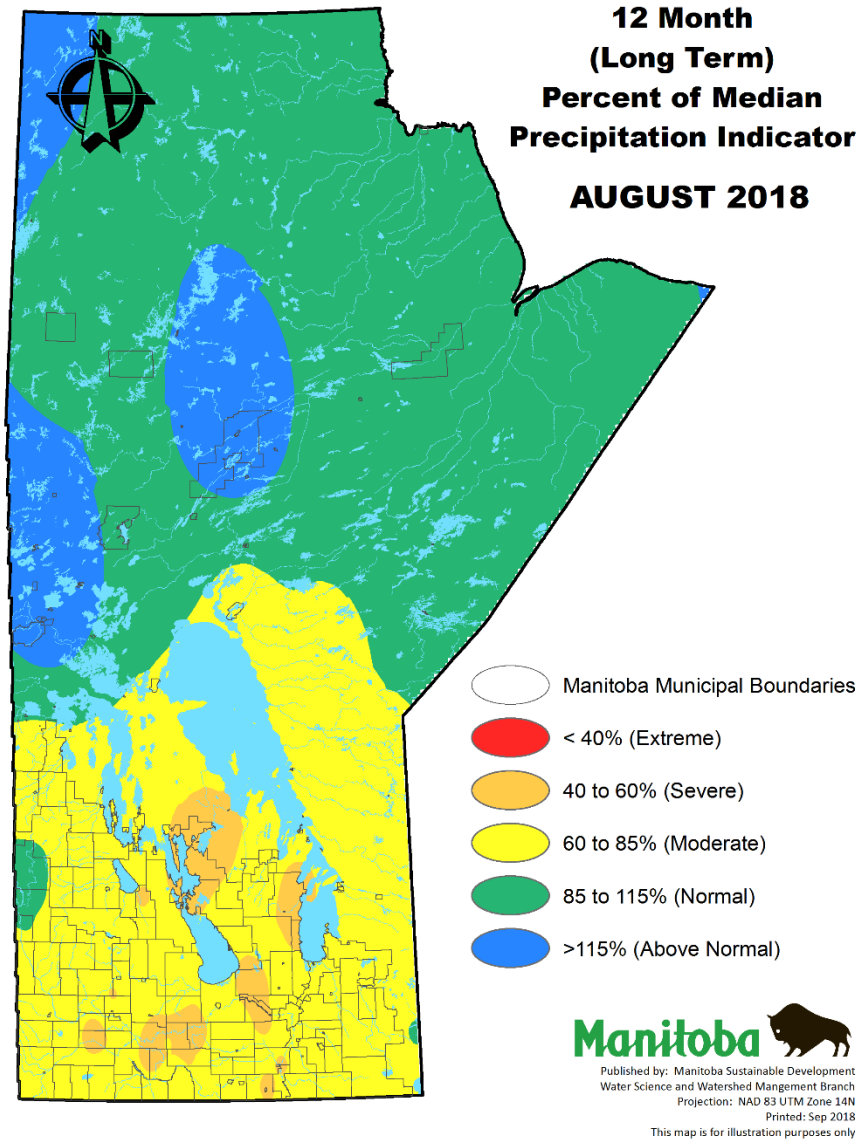


Figure 3: Long term (12 month) per cent of median precipitation indicator.

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 29, 2018.

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 Monitoring Map* tab.

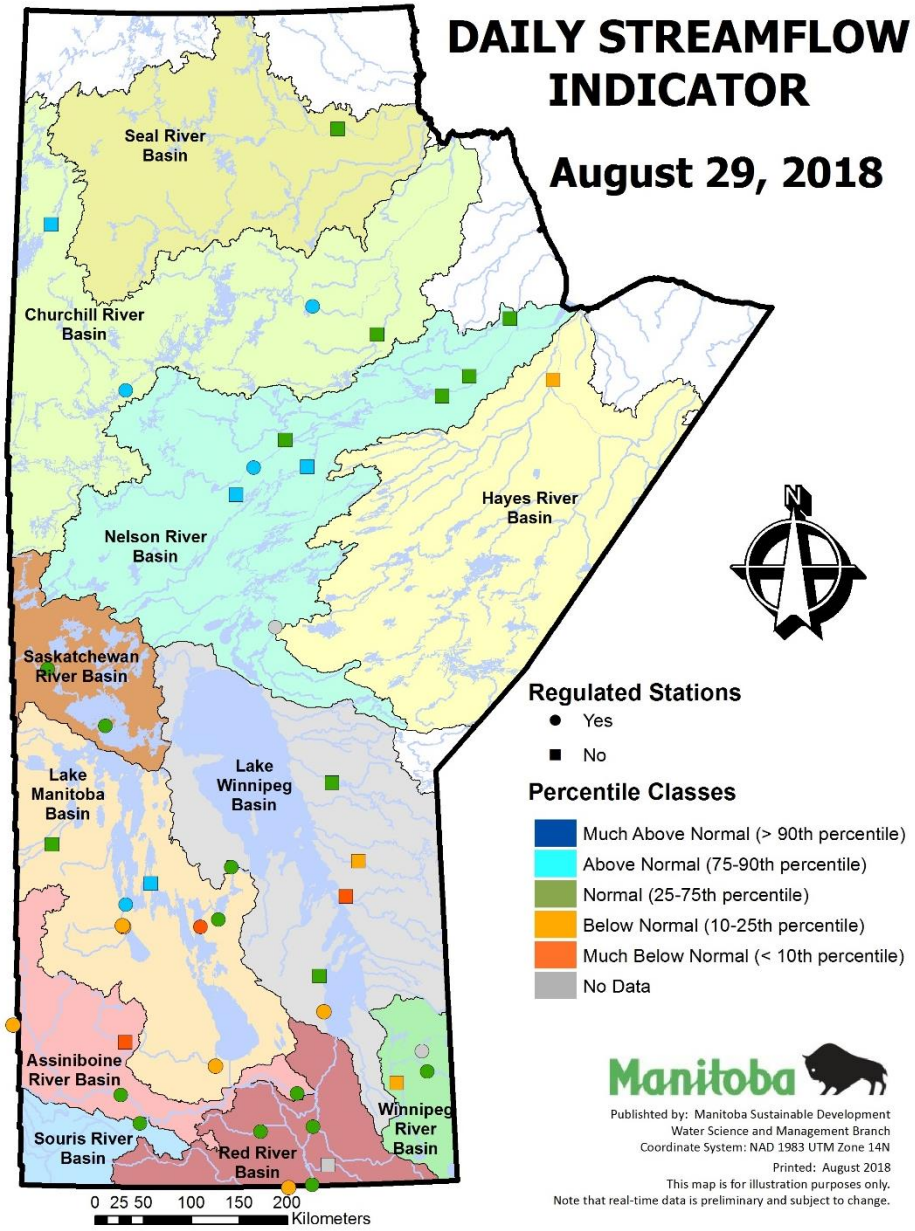


Figure 4: Daily streamflow and lake level indicator for August 29, 2018.

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 5).

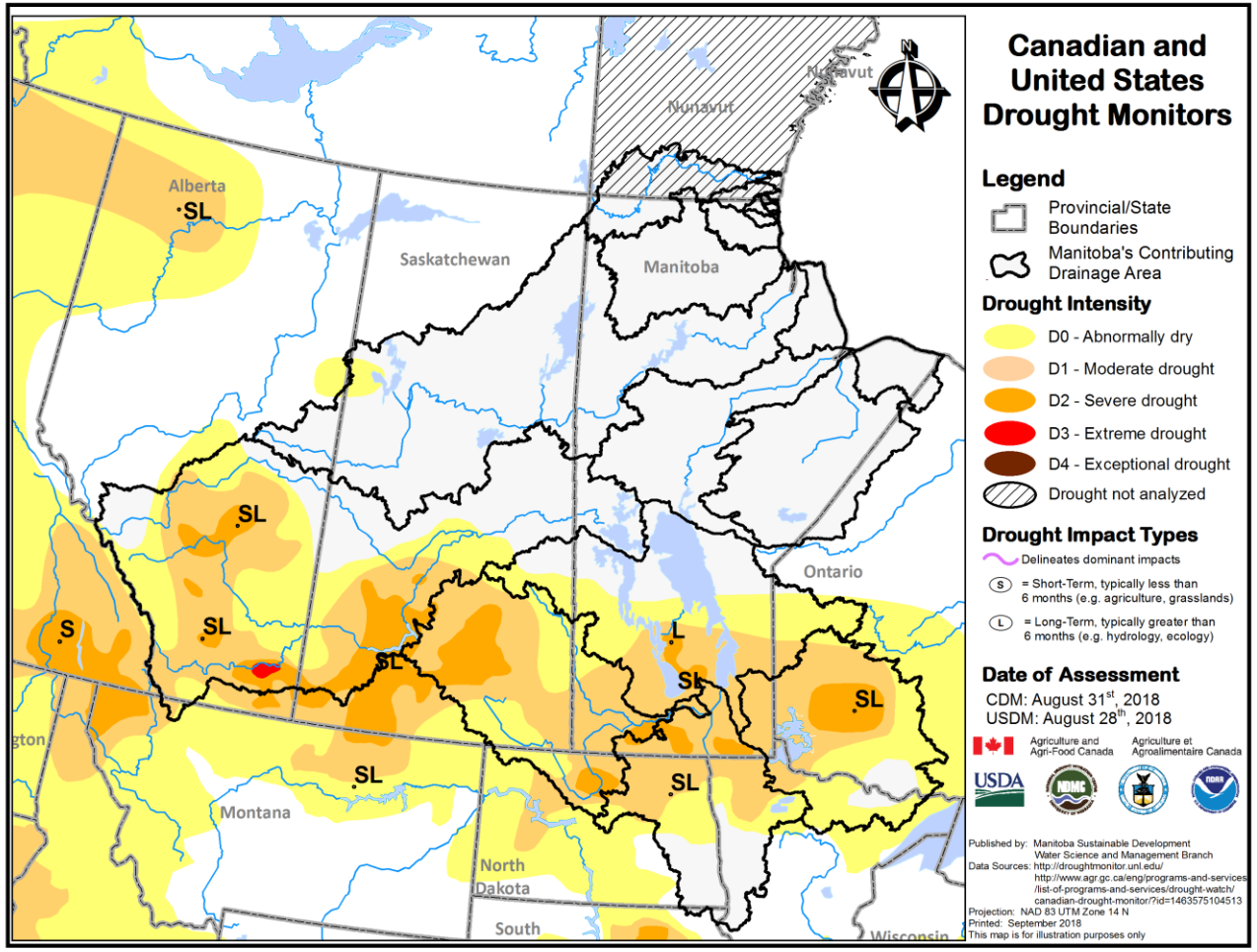


Figure 5: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of August 31, 2018.

Water Availability

Reservoir Conditions

Of the fifteen water supply reservoirs shown in Table 1, nine are automated with real-time water level information. The remaining six locations, shown in red below, require site visits and therefore do not always have recent water level readings, as indicated in the *Observed Date* column in Table 2. Most reservoirs have sufficient supply levels given the dry conditions. Stephenfield Reservoir and Jackson Lake levels and system withdrawals are being closely monitored.

Table 1: Reservoir Status (Southern and Western Manitoba).

Water Supply Reservoir Levels and Storages – August 29, 2018.								
Lake or Reservoir	**Community 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*	1,402.06	August 28, 2018	-0.44	300,000	294,618	98%
Lake Wahtopanah (Rivers)	Rivers	1,536*	1,535.15	August 29, 2018	-0.85	24,500	23,568	96%
Minnewasta (Morden)	Morden	1,082*	1,079.26	August 29, 2018	-2.74	3,150	2,713	86%
Stephenfield	Carman, Pembina Valley Water Co-op	972*	968.70	August 29, 2018	-3.30	3,810	2,519	66%
Vermilion	Dauphin	1,274*	1,269.59	August 29, 2018	-4.41	2,600	1,511	58%
Goudney (Pilot Mound)		1,482*	1,481.79	August 29, 2018	-0.21	450	436	97%
Jackson Lake		1,174*	1,168.51	August 29, 2018	-5.49	2,990	1,681	56%
Manitou (Mary Jane)		1,537*	1,531.99	August 29, 2018	-5.01	1,150	779	68%
Turtlehead (Deloraine)	Deloraine	1,772*	1,771.44	**July 31, 2018**	-0.56	1,400	1,372	98%
Kenton Reservoir		1,448	1,447.82	**July 11, 2018**	-0.18	600	586	98%
Killarney Lake		1,615	1,614.50	**July 16, 2018**	-0.50	7,360	7,128	97%
Lake Irwin		1,178	1,178.14	**June 19, 2018**	0.14	3,800	3,889	102%
Elgin		1,532	1,533.95	**July 10, 2018**	1.95	520	647	124%
Rapid City		1,573.5	1,574.63	**July 11, 2018**	1.13	200	279	139%
St. Malo		840	840.08	**August 1, 2018**	0.08	1,770	1,783	101%

[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 17 (August 27, 2018) are summarized in Table 2.

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

Region	General Dugout Condition
Eastern	60 % adequate. 30 – 40 % of dugouts are dry, remaining are <20 % full. Livestock being moved to pastures with water.
Interlake	Dugouts 10 – 30 % full, some dry. Quality is poor. Water being pumped/hauled.
Southwest	Dugouts 40 % full. Producers are looking to fill for winter.
Central	Dugouts 20 - 30 % full. Water is being hauled. Dugouts are being cleaned to improve water access.
Northwest	Ste. Rose and Dauphin area are 40 – 50 % full. Roblin and Swan River area are 75 - 90 % full.

Soil Moisture

Manitoba Agriculture's mapping of topsoil (0 – 30 cm) conditions as of August 26, 2018 shows most of agro-Manitoba was experiencing dry topsoil conditions, with regions of adequate soil moisture and some pockets of very dry conditions (Figure 6).

Topsoil moisture condition maps are available at: https://www.gov.mb.ca/agriculture/weather/weather-conditions-and-reports.html.

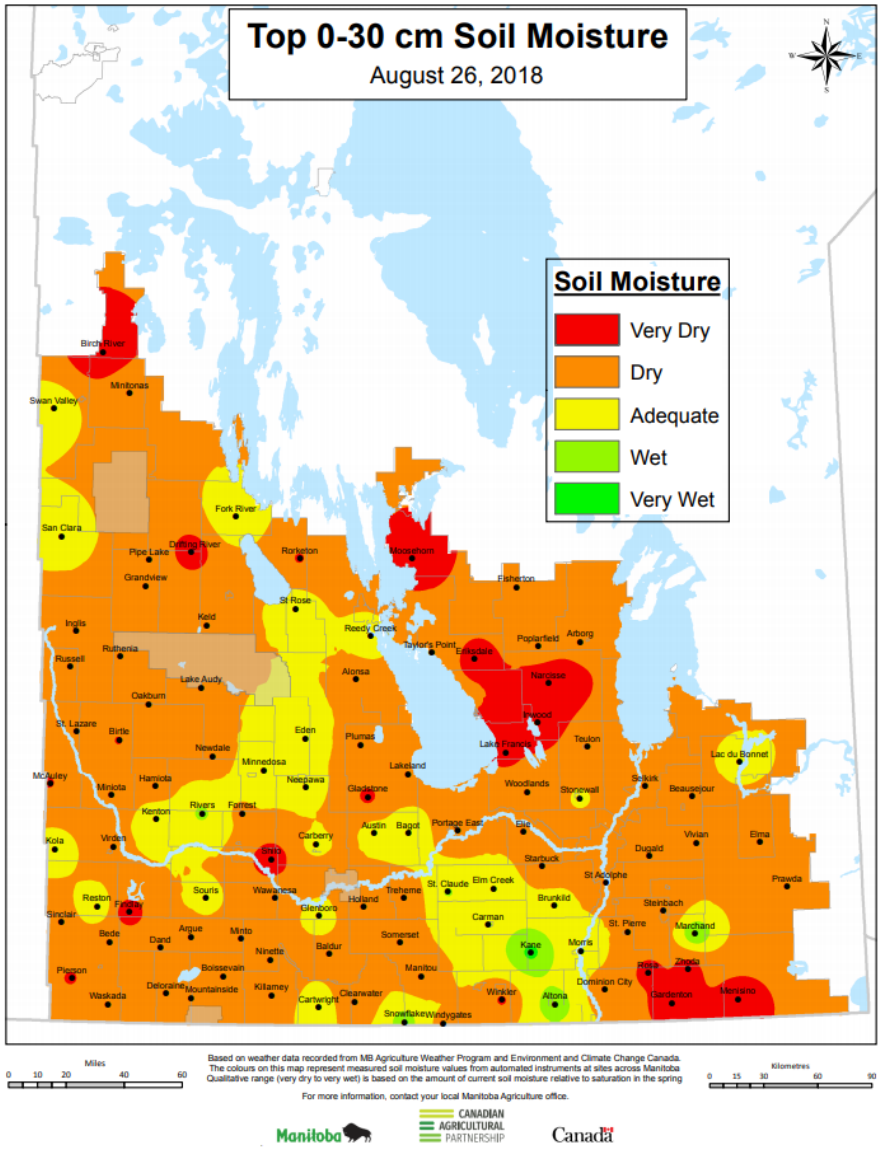


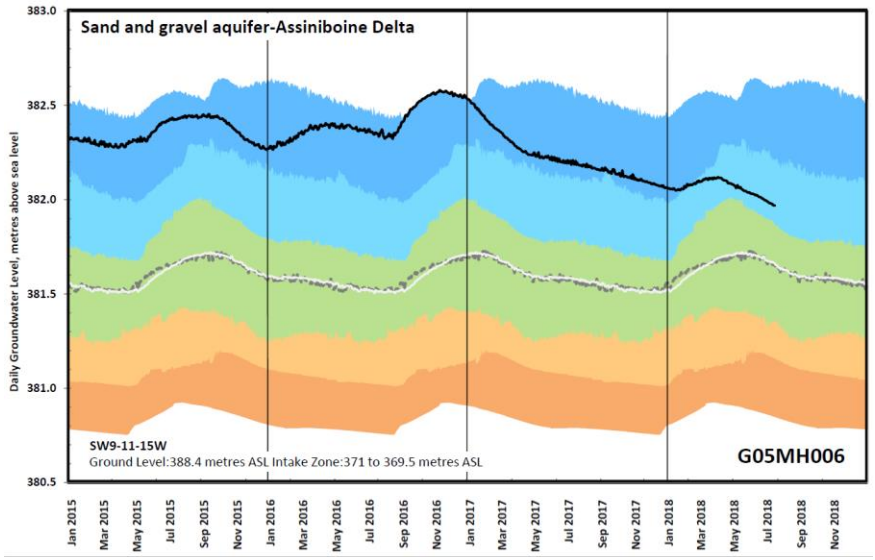
Figure 6: Manitoba Agriculture's August 26, 2018 mapping of soil moisture conditions in the top 0 – 30 cm.

Aquifers

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 constructed in near surface sand aquifers. 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.

Groundwater hydrographs from 2015 to the end of August 2018 for the Assiniboine Delta aquifer, the Oak Lake aquifer, and the Carbonate aquifer near Anola are provided on Figure 7.



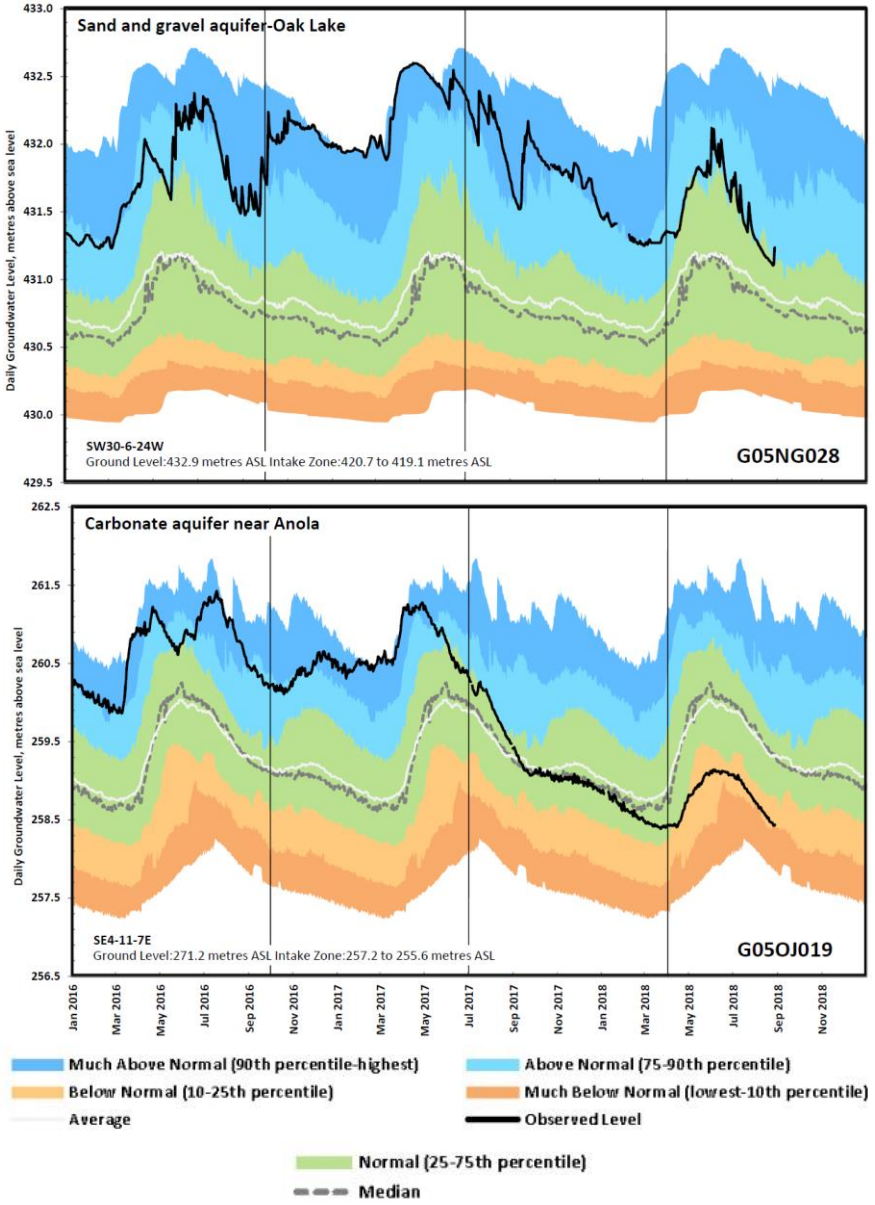


Figure 7: Groundwater hydrographs for the Assiniboine Delta aquifer (left), the Oak Lake aquifer (top), and the Carbonate aquifer near Anola (bottom).

Wildland Fires

As of August 29, 2018, the Provincial Wildfire Program reported 450 wildfires had occurred during the 2018 fire season with a total of 210,784 hectares burned overall. Approximately 55,000 hectares (25 % of total) were burned during the month of August, primarily in the eastern and northeast regions.

Fire danger levels (Figure 8) for August 30, 2018 were generally moderate across most of southern Manitoba with some regions of high or extreme danger, while remaining low in the north.

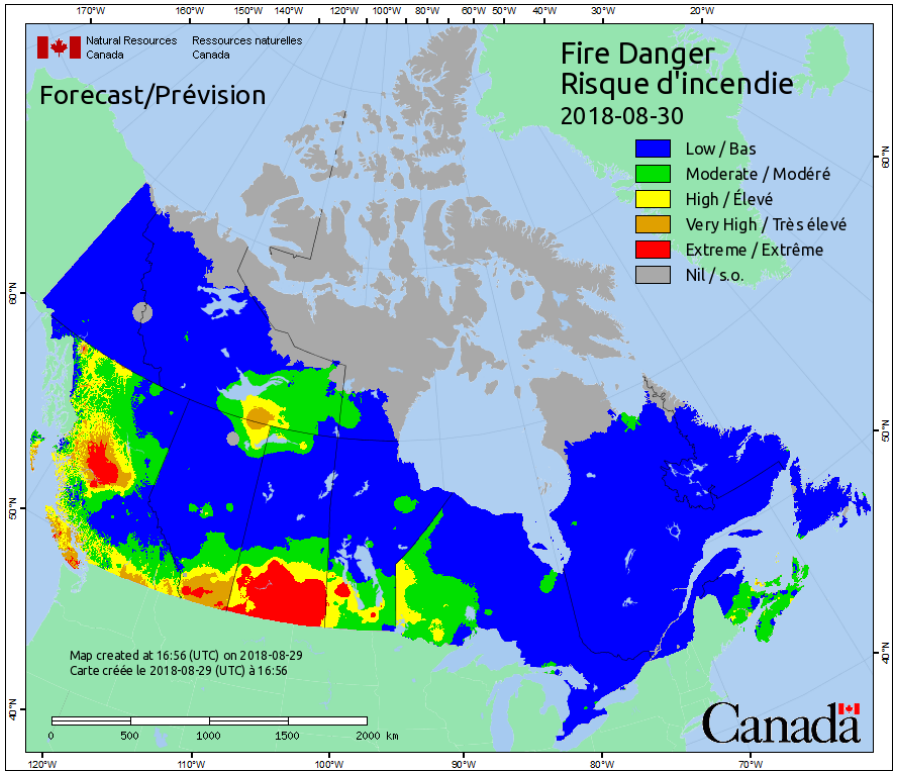


Figure 8: Fire danger mapping by Natural Resources Canada.

Drought Impacts

Due to elevated wildfire danger, as of August 24, 2018 there was a backcountry fire ban in place for Spruce Woods Provincial Park.

Manitoba Agriculture published Crop Report: Issue 17 on August 27, 2018. It is reported that low humidity and limited rain have caused premature ripening, limited pasture regrowth and very dry seed. Some areas are reporting increased grasshopper activity. Please refer to the Crop Report for preliminary information on yields.

Impacted livestock producers in dry areas continue to look for alternate feed sources to sustain their needs. This includes straw, baling sloughs or ditches or purchasing feed grains. Manitoba Hay Listings and Pastures for Rent or Wanted listings are available.

In the Interlake region, producers continue to haul and pump water for livestock consumption. In the southwest region some producers are looking at options for filling dugouts for winter water supplies. In the central region, some livestock producers are cleaning dugouts to improve water access and/or bringing in supplemental water to meet livestock needs.

Manitoba Farm, Rural & Northern Support Services provide phone and online counselling and other mental health resources to farmers, rural and northern Manitobans. Producers and residents experiencing high levels of stress can call their support line toll free at 1-866-367-3276 for free and confidential support.

Future Weather

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

The National Oceanic and Atmospheric Administration indicated that ENSO-neutral conditions are currently present and are favoured through Northern Hemisphere during summer 2018. There is a 60 % chance that El Niño conditions will develop during fall 2018, increasing to a 70 % chance during winter 2018-19.

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:
http://www.gov.mb.ca/mit/floodinfo/floodoutlook/river_conditions.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:
http://www.gov.mb.ca/conservation/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: *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