

Water Availability and Drought Conditions Report

JULY 2018

Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for July 2018.
- Precipitation was highly variable during July and most of agro-Manitoba continues to experience dryness and needs additional rainfall.
 - In July, large portions of the southwest, central, Interlake and eastern regions of agro-Manitoba observed moderately (60 to 85 % of median) to severely (40 to 60 %) dry conditions, with numerous pockets of extremely dry (<40 %) conditions. Most of northwest agro-Manitoba and the northern half of the province observed normal or above normal rainfall over the past month.
 - Over the past three months, most of southern Manitoba observed moderately dry conditions, with a region of severely to extremely dry conditions in the west Interlake. Conversely, a region spanning from the southwest corner of the province northeast towards Dauphin Lake and most of northern Manitoba observed normal or above normal rainfall during this period.
 - Over the past 12 months, most of southern Manitoba observed moderately dry conditions, with a region of severely dry conditions in the Interlake. The remainder of the province, including two regions in southwest and northwest agro-Manitoba, observed normal or above normal precipitation conditions during this period, except for Churchill which was moderately dry.
- As of July 31, 2018, below normal (10th - 25th percentile) or much below normal (< 10th percentile) streamflows were observed on the Roseau, Boyne, Mossy, Little Saskatchewan, Winnipeg, Whitemouth, Whiteshell, and Bloodvein rivers. Below normal or much below normal water levels were observed on Lake Winnipeg, Lake Manitoba, and Round Lake.
- Groundwater levels in major aquifers are generally good. However, water levels in the Carbonate Aquifer near Anola continue to be below normal (10th - 25th percentile) during July 2018.
- The Canadian Drought Monitor classified a large portion of southern Manitoba as D0 (abnormally dry conditions) as of July 31, 2018. D1 (moderate drought) conditions are located in the central, eastern, and Interlake regions of agro-Manitoba, with a pocket of D2 (severe drought) in the western Interlake.
- There are currently no major concerns over reservoir water supplies. Manitoba Agriculture stated that on farm water supplies are low but still adequate in most areas, except for the Interlake where producers are hauling and pumping water for livestock.
- Wildfires burned ~67,000 hectares during the month of July, primarily in northeastern and eastern Manitoba. Suppression activities continue on a large fire near Bissett. Back country closures are in place for areas within the eastern region.
- 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 August-September-October projects temperatures to be above normal. Precipitation is forecasted as below normal in the southwest corner of the province and within a region at the north end of Lake Winnipeg, and normal throughout the remainder of Manitoba.

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.

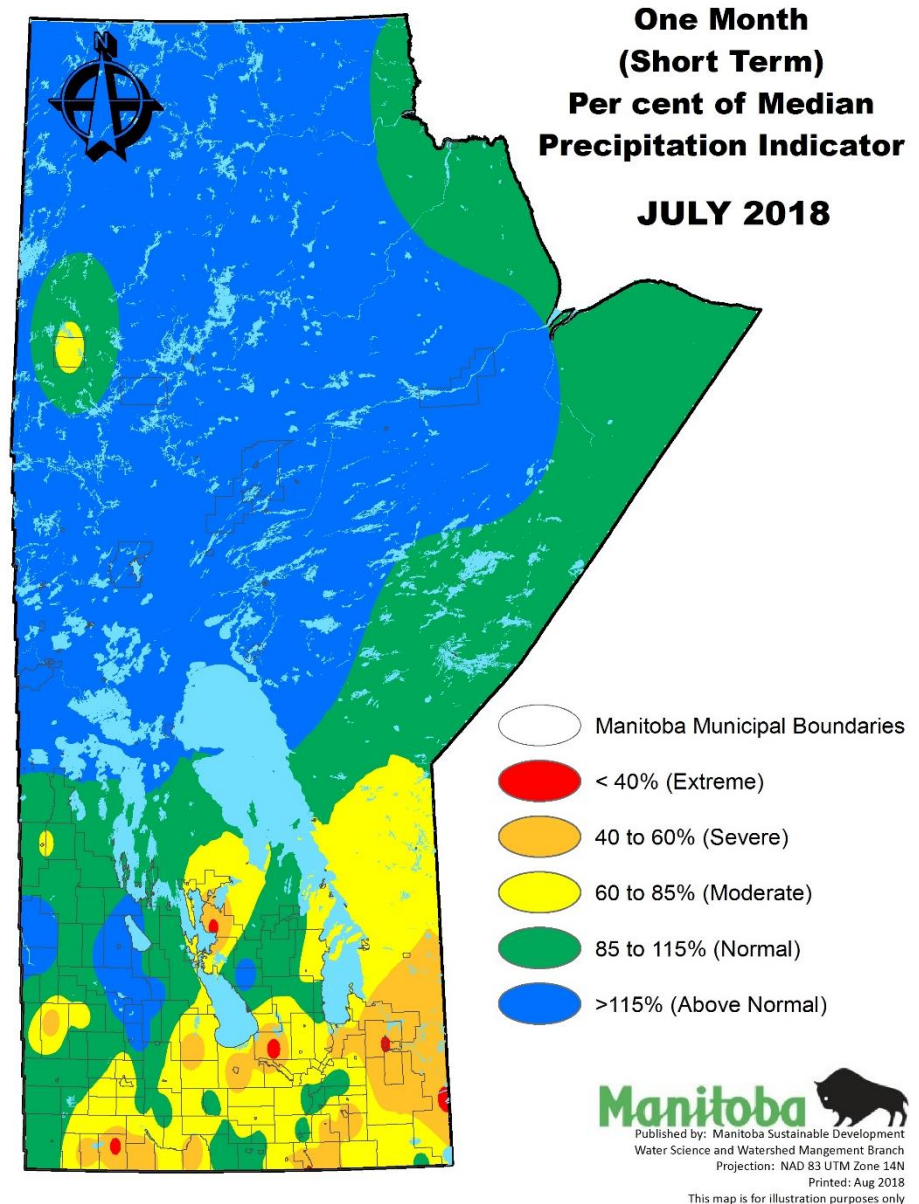


Figure 1: Short term (one month) per cent of median precipitation indicator.

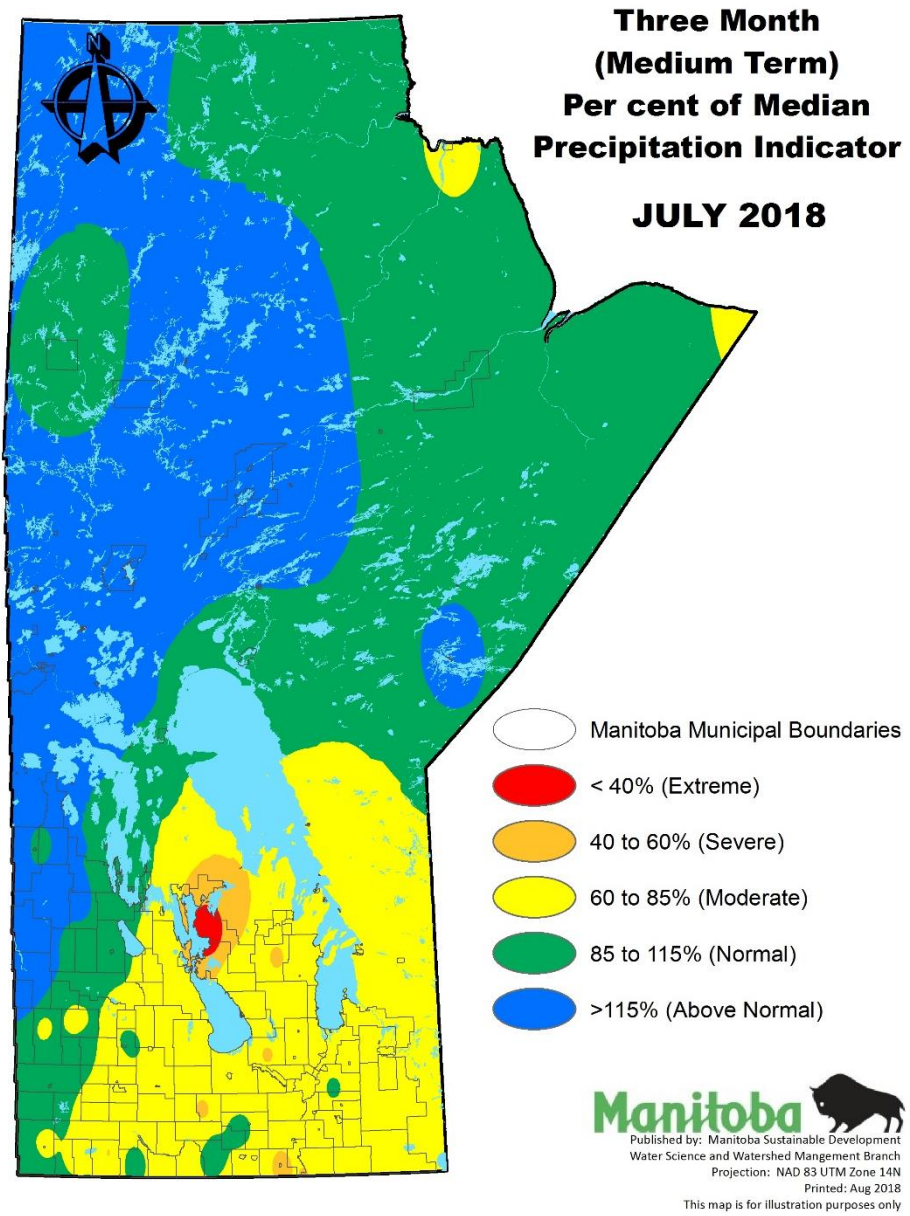


Figure 2: Medium term (three month) per cent of median precipitation indicator.

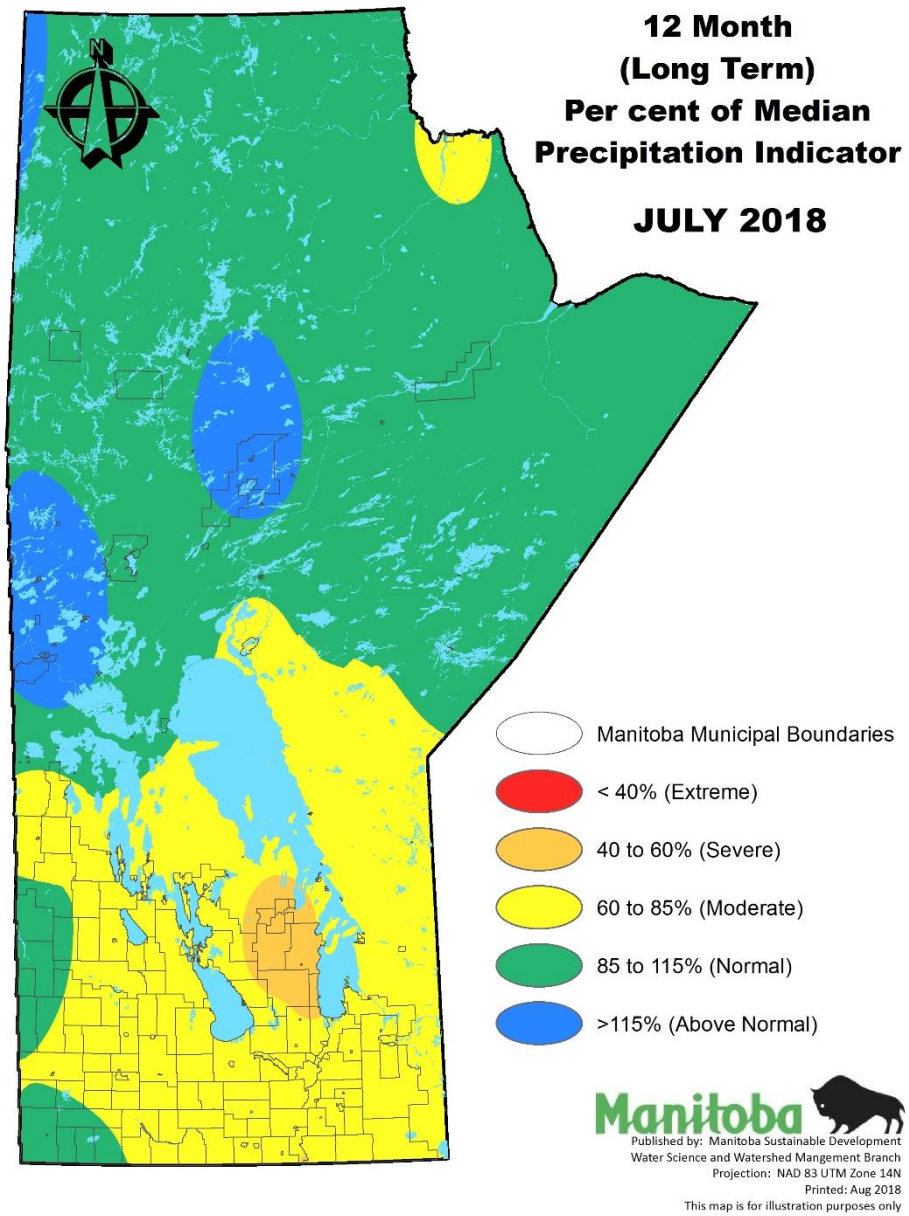


Figure 3: Long term (12 month) per cent of median precipitation indicator.

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 July 31, 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.

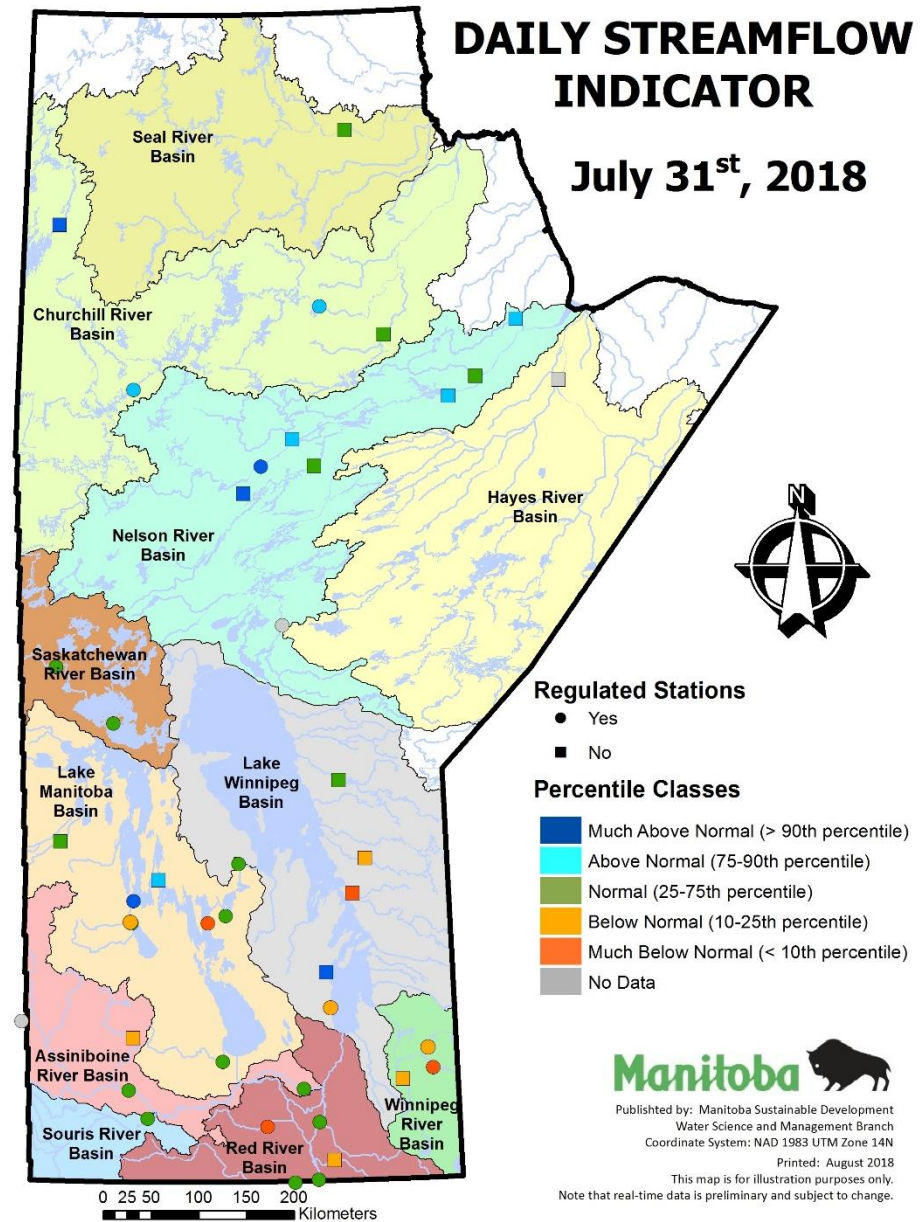


Figure 4: Daily streamflow and lake level indicator for July 31, 2018.

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).

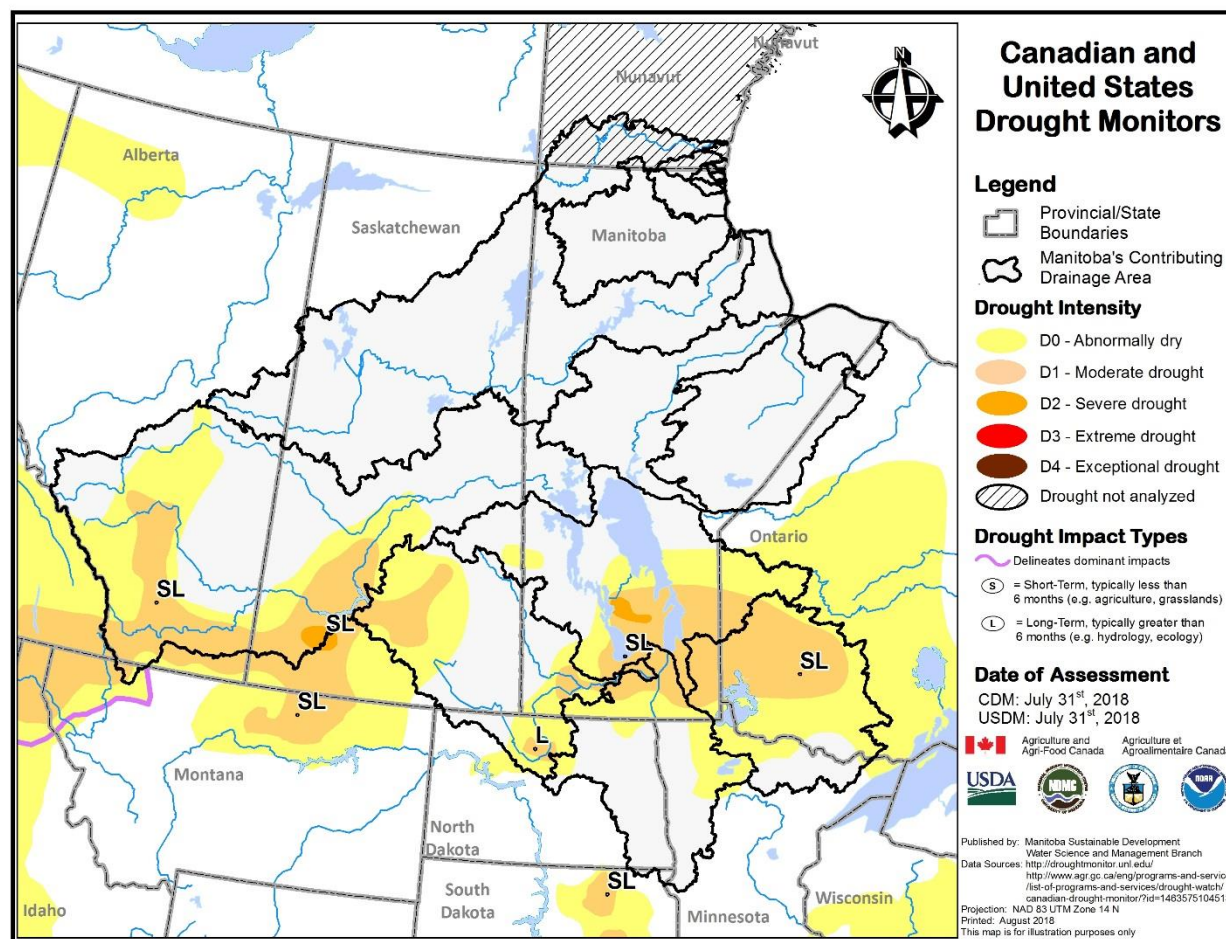


Figure 5: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of July 31, 2018.

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. Overall, there are currently no concerns over reservoir water supplies.

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

Water Supply Reservoir Levels and Storages – July 31, 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	1,402.5*	1,402.97	July 31, 2018	0.47	300,000	305,640	102%
Lake Wahtopanah (Rivers)	Rivers	1,536*	1,538.53	July 31, 2018	2.53	24,500	29,925	122%
Minnewasta (Morden)	Morden	1,082*	1,080.36	July 31, 2018	-1.64	3,150	2,879	91%
Stephenfield	Carman	972*	970.29	July 31, 2018	-1.71	3,810	3,014	79%
Vermilion	Dauphin	1,274*	1,272.78	July 31, 2018	-1.22	2,600	2,281	88%
Goudney (Pilot Mound)		1,482*	1,482.01	July 31, 2018	0.01	450	450	100%
Jackson Lake		1,174*	1,170.28	July 31, 2018	-3.72	2,990	2,085	70%
Manitou (Mary Jane)		1,537*	1,536.76	July 31, 2018	-0.24	1,150	1,129	98%
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	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 13 (July 30th, 2018) are summarized in Table 2. If conditions were not described in Issue 13, the date corresponding to the most recently reported conditions is provided in brackets.

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

Region	General Dugout Condition
Eastern	About one third full
Interlake	Producers are hauling and pumping water for livestock consumption
Southwest	50 to 60 % full
Central	Adequate at this time, but water levels are going down in dugouts
Northwest	Dugout levels are very low (July 23, 2018)

Soil Moisture

Manitoba Agriculture’s mapping of topsoil (0 – 30 cm) conditions as of July 30, 2018 shows most of agro-Manitoba was experiencing adequate to dry topsoil conditions with some regions of very dry conditions (Figure 6).

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

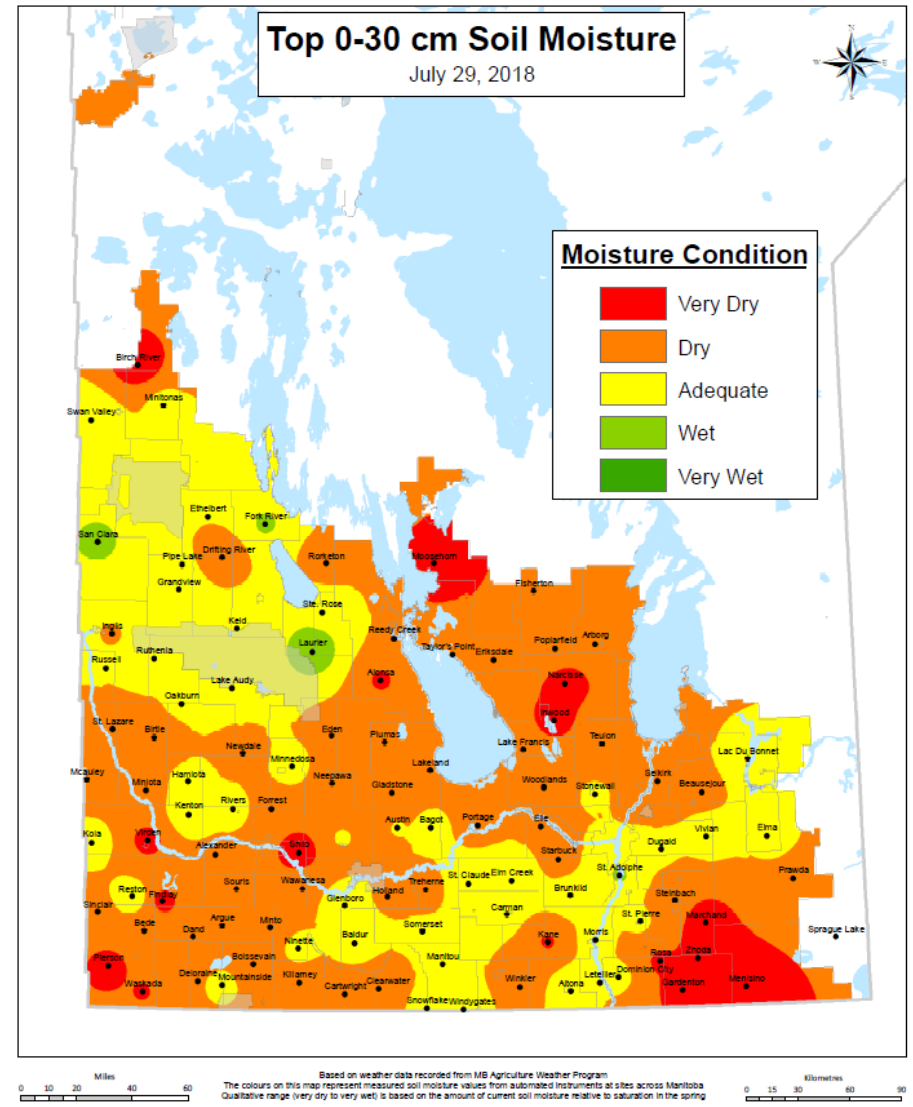


Figure 6: Manitoba Agriculture’s July 30, 2018 mapping of soil moisture conditions in the top 0 – 30 cm.

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 levels in major aquifers are generally good. Groundwater hydrographs from 2015 to the end of July 2018 for the Assiniboine Delta aquifer, the Oak Lake aquifer, and the Carbonate aquifer near Anola are provided on Figure 7.

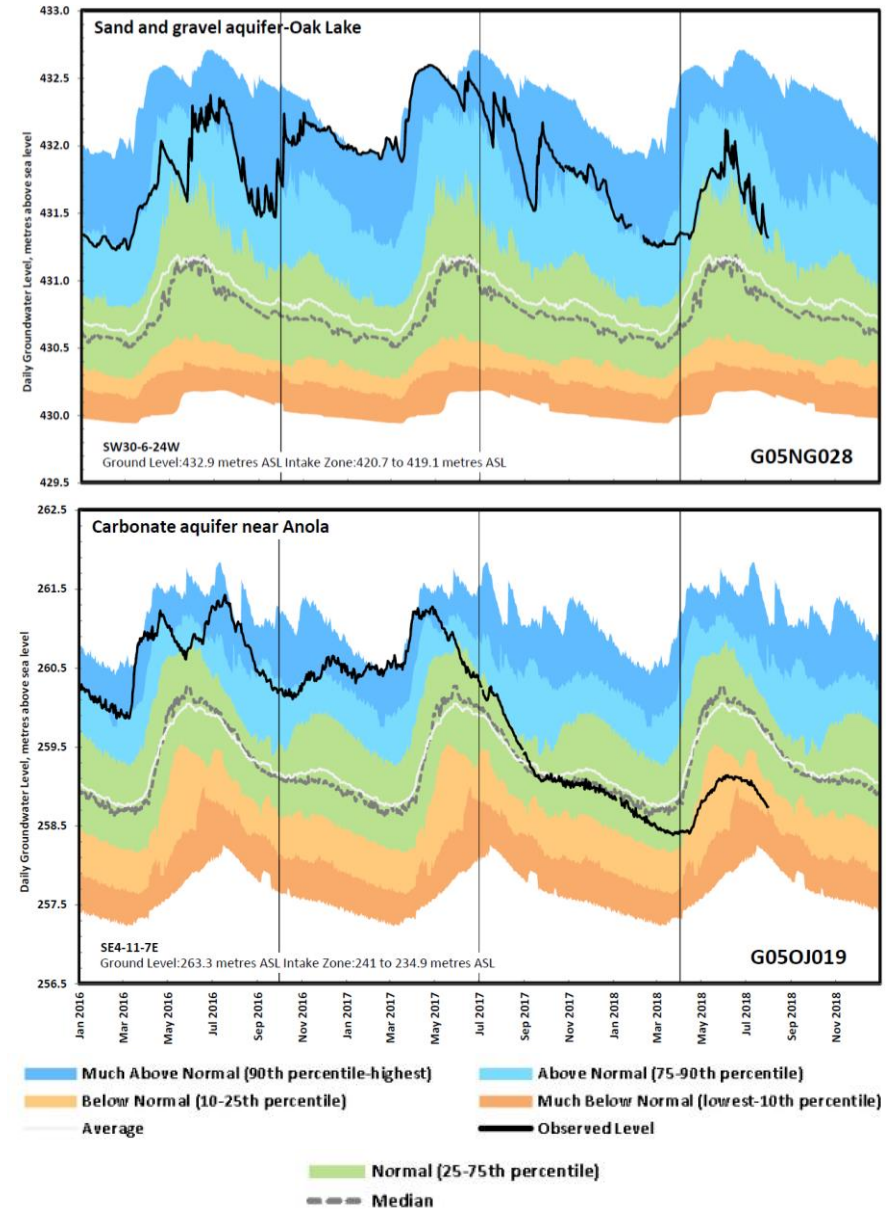
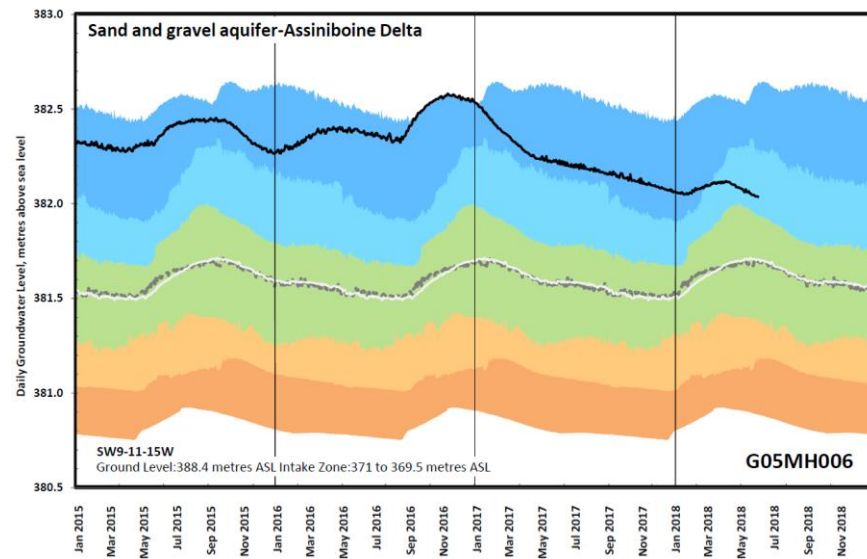


Figure 7: Groundwater hydrographs for the Assiniboine Delta aquifer (left), the Oak Lake aquifer (top), and the Carbonate aquifer near Anola (bottom).

Wildland Fires

As of July 30, 2018, the Provincial Wildfire Program reported 401 wildfires had occurred during the 2018 fire season with a total of 157,218 hectares burned overall. Approximately 67,000 hectares (43 % of total) were burned during the month of July, primarily in the eastern and northeast regions. As of July 30, suppression activities continued on a large fire 20 km north of Bissett.

Fire danger levels (Figure 8) on July 31, 2018 ranged from moderate to extreme across southern Manitoba, while remaining low in the north.

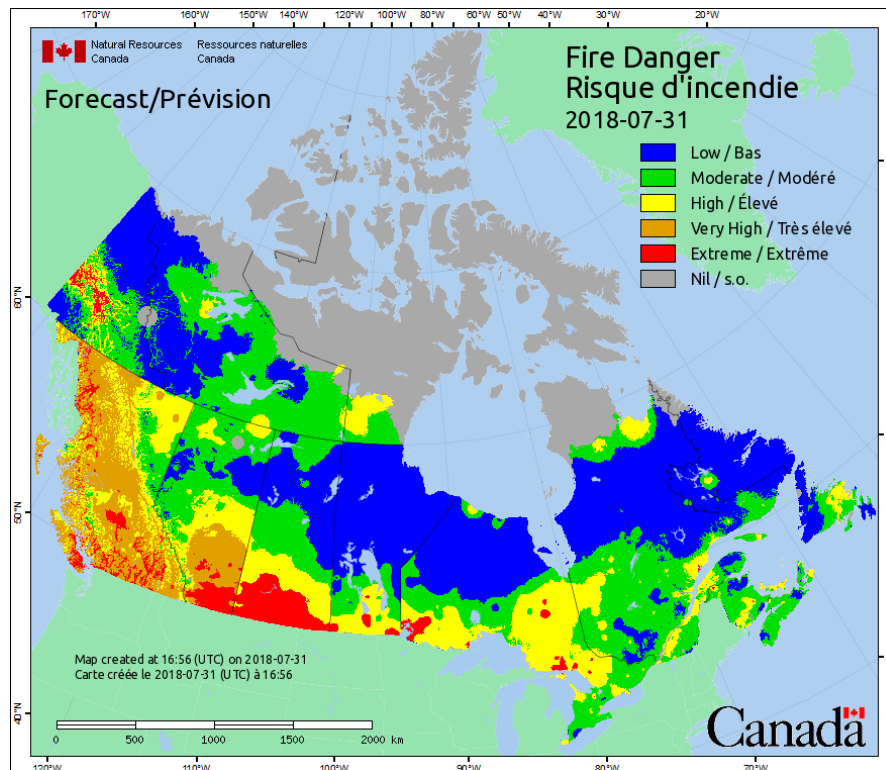


Figure 8: Fire danger mapping by Natural Resources Canada.

Drought Impacts

As a result of risks posed by adjacent wildfires, back country closures were implemented on July 22, 2018 for the following locations: Bloodvein River recreational canoeing and access corridor area in Atikaki Provincial Park, Bird River-Elbow Lake Canoe Route, and 19 designated water route campsites in Nopiming Provincial Park. The closures remain in place until further notice.

Manitoba Agriculture published [Crop Report: Issue 13](#) on July 30, 2018. It is reported that crops are advancing rapidly with the warm and dry conditions, however rain is needed in most areas to sustain crops and replenish soil moisture. Areas with lighter textured soils have prematurely ripening crops. There are reports of moisture stress to corn and soybeans in some regions. Earlier than normal harvest dates are expected.

First cut hay is near completion and yields are below to well below normal due to dry conditions. Regrowth is limited due to continued dryness, and a second cut might not be possible in some areas. There have been some reports of grasshoppers damaging hay and pasture growth. Producers in dry areas are looking for alternate feed sources to sustain their needs. This includes green feed, and cutting of ditches and dried up sloughs. In the Interlake region, producers are hauling and pumping water for livestock consumption.

[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 (August-September-October) predicts temperatures will be above normal across Manitoba. Precipitation over the next three months is forecasted to be below normal within the southwest corner of the province and in an isolated region at the north end of Lake Winnipeg. Normal precipitation is forecasted to occur throughout the remainder of Manitoba.

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 65 % 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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Acknowledgements

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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:

<http://www.gov.mb.ca/agriculture/weather/pubs/topsoil-moisture-conditions.pdf>

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