

Water Availability and Drought Conditions Report

SEPTEMBER 2018

Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for September 2018.
- Precipitation conditions over the past month, three month, and twelve month periods are as follows:
 - In September, most of the province observed normal (85 to 115 % of median) or above normal (> 115 % of median) precipitation. Small, isolated pockets of agro-Manitoba and a region to the west of Churchill experienced moderately dry (60 to 85 % of median) conditions.
 - Over the past three months, most of southern Manitoba observed moderately dry conditions, except for the southern Interlake and the area east of Lake Winnipeg which experienced normal rainfall. Northern Manitoba experienced normal or above normal precipitation during this period.
 - Over the past 12 months, most of southern Manitoba observed moderately dry conditions, with pockets of severely dry (40 to 60 % of median) conditions. The remainder of the province experienced normal or above normal precipitation conditions during this period.
- As of October 1, 2018, below normal (10th - 25th percentile) or much below normal (< 10th percentile) streamflows were observed on the Pembina, Roseau, Souris, Winnipeg, 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 in the normal range. However, water levels in the Carbonate Aquifer near Anola continued to be below normal (10th - 25th percentile) during September 2018.
- The Canadian Drought Monitor classified southern Manitoba as D1 (moderately dry conditions) with pockets of D2 (severe drought) conditions as of September 30, 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 due to lower levels.
- Manitoba Agriculture stated that dugout levels are very low across most of agro-Manitoba. Funding for producers is now available for water source development projects through [Ag Action Manitoba – Assurance: Beneficial Management Practices](#).
- 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.
- Wildfires burned ~7,170 hectares during the month of September, almost exclusively in northeastern Manitoba. During the 2018 wildfire season, a total of 217,961 hectares were burned, which is considered to be close to average.
- Environment and Climate Change Canada's seasonal forecast for October-November-December projects temperatures and precipitation amounts to be above 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.

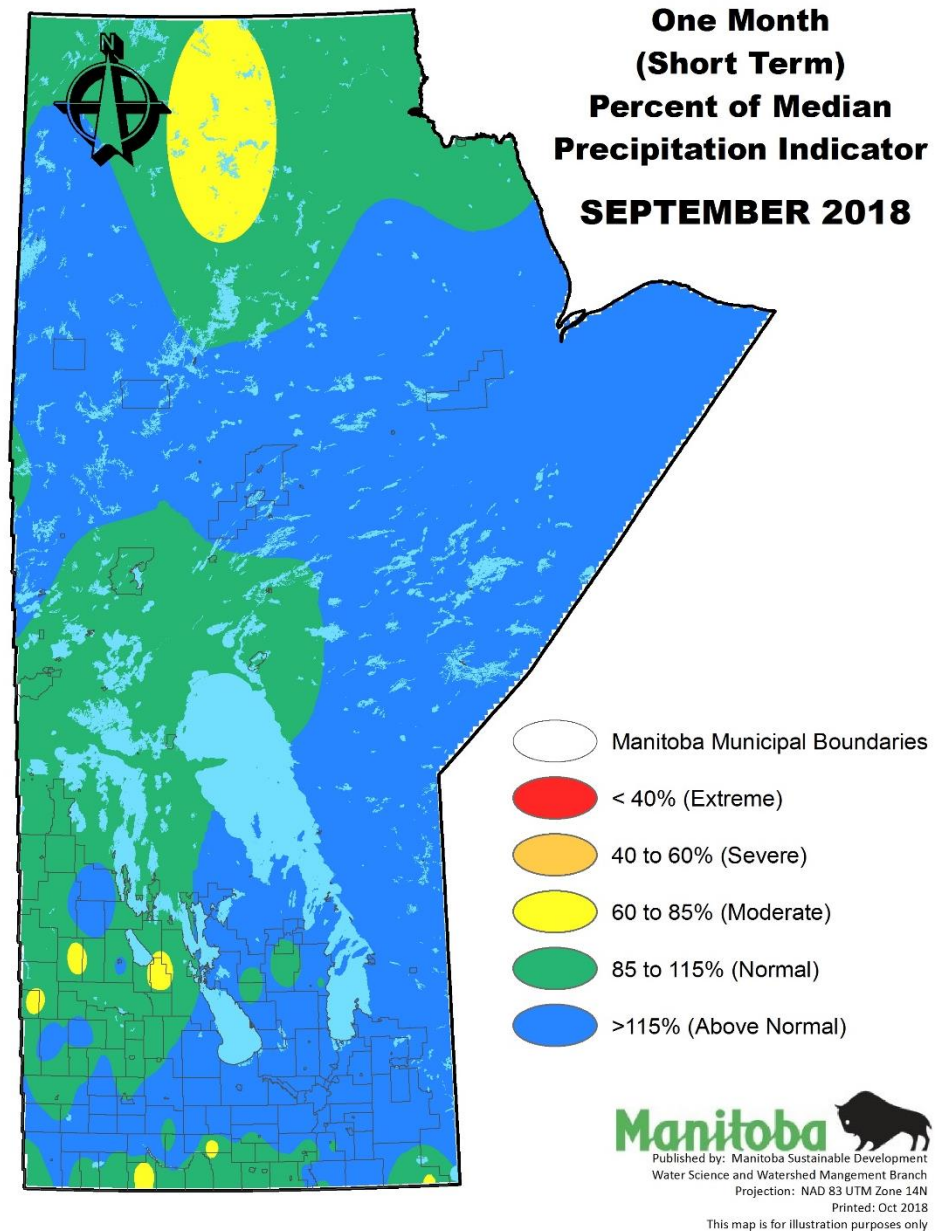


Figure 1: Short term (one month) per cent of median precipitation indicator.

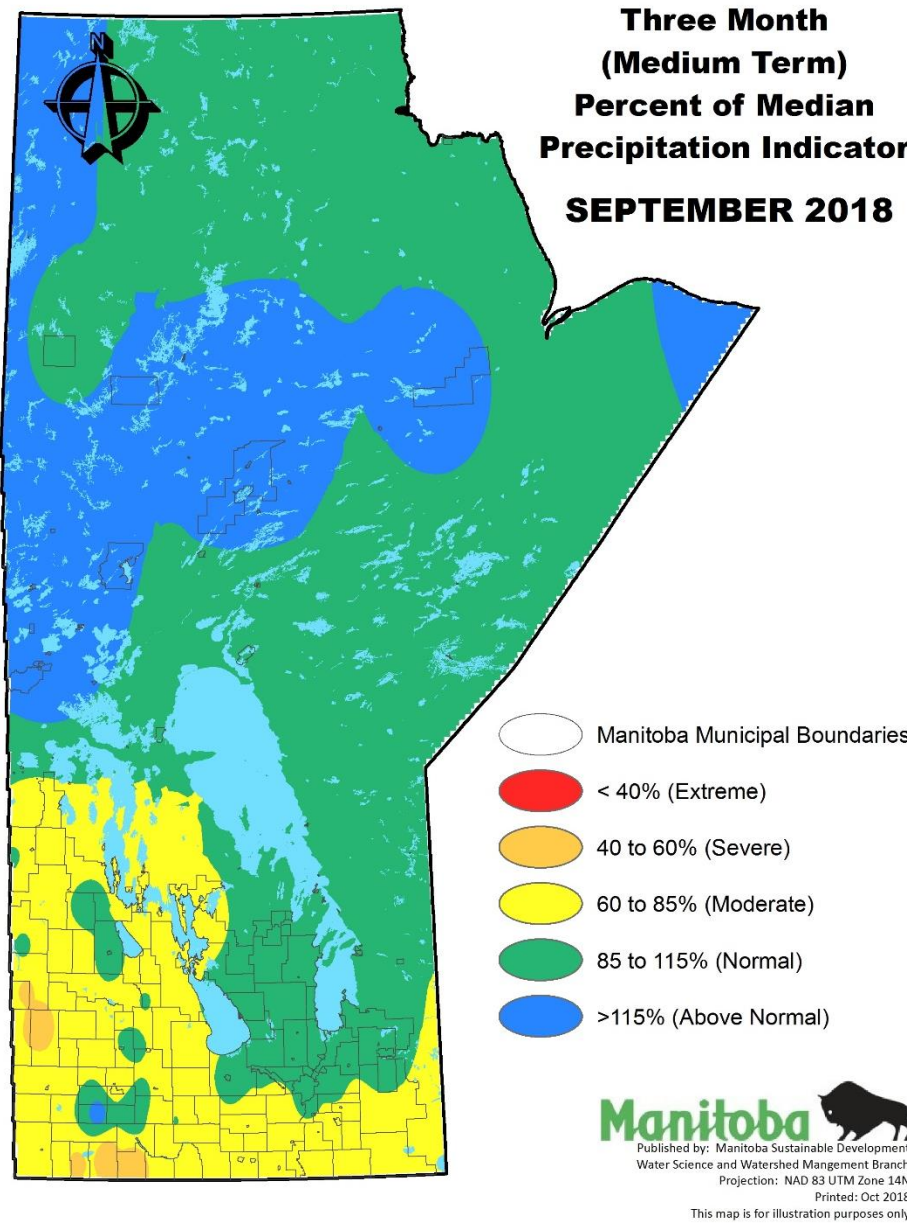


Figure 2: Medium term (three month) per cent of median precipitation indicator.

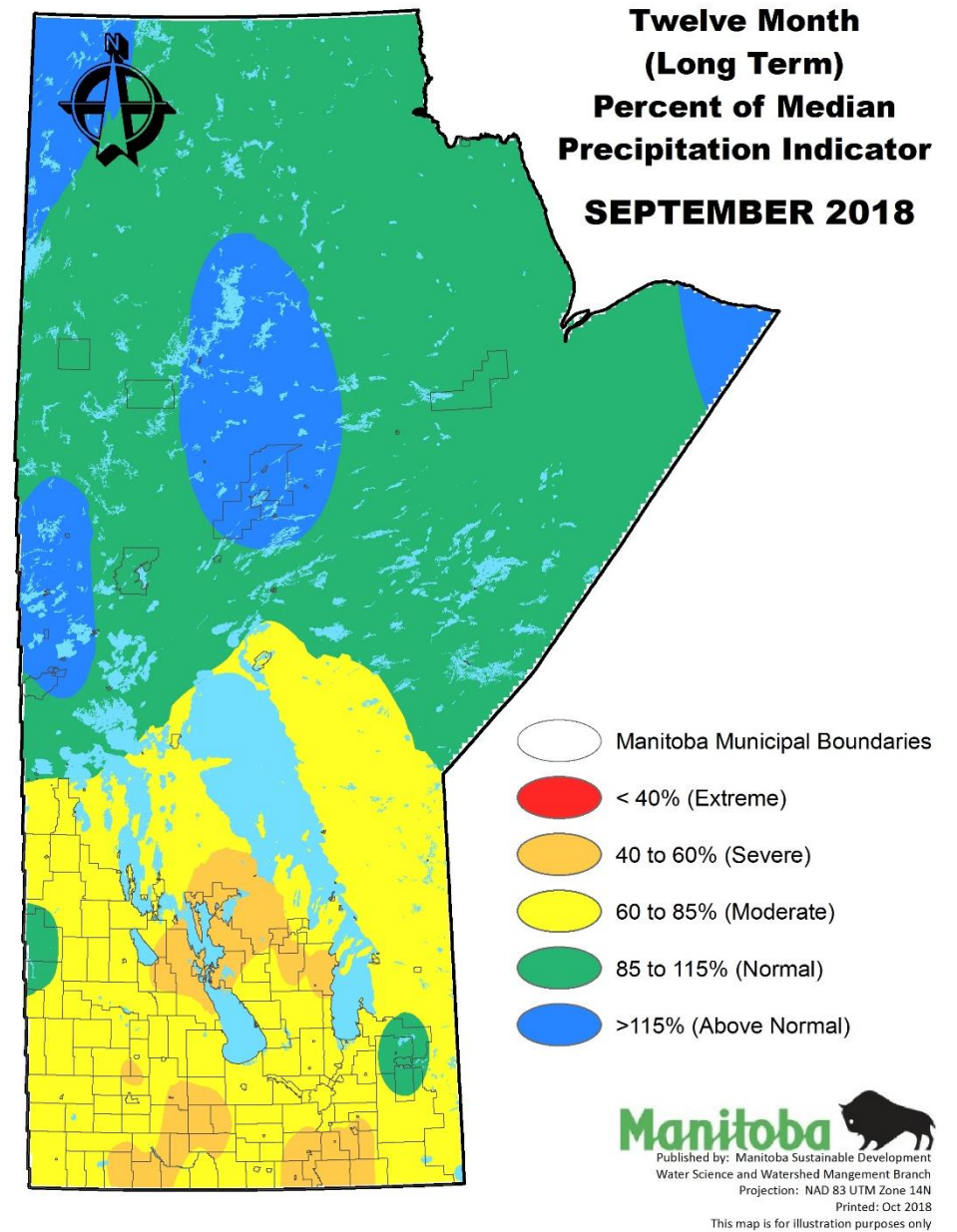


Figure 3: Long term (12 month) per cent of median precipitation indicator.

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 October 1, 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.

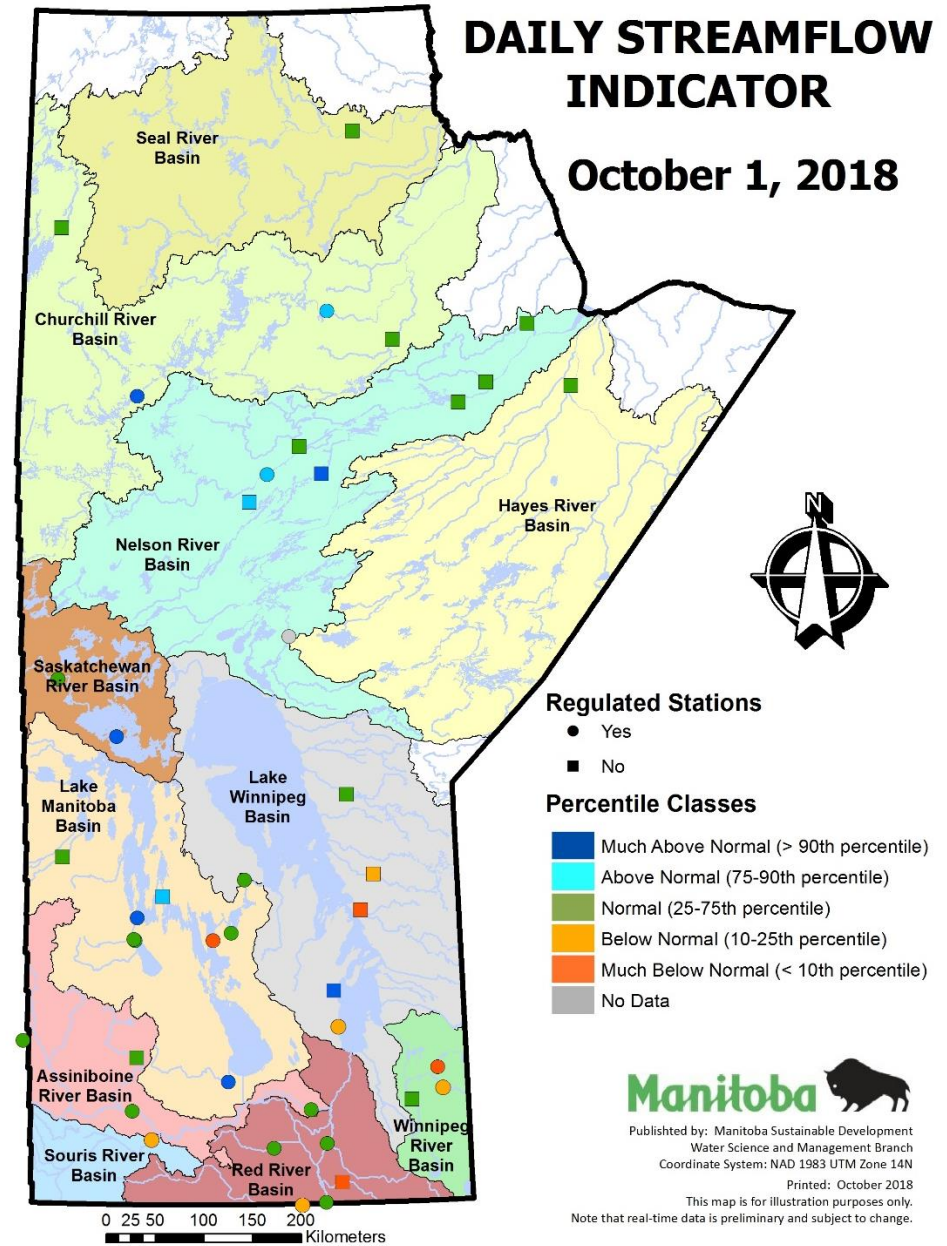


Figure 4: Daily streamflow and lake level indicator for October 1, 2018.

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).

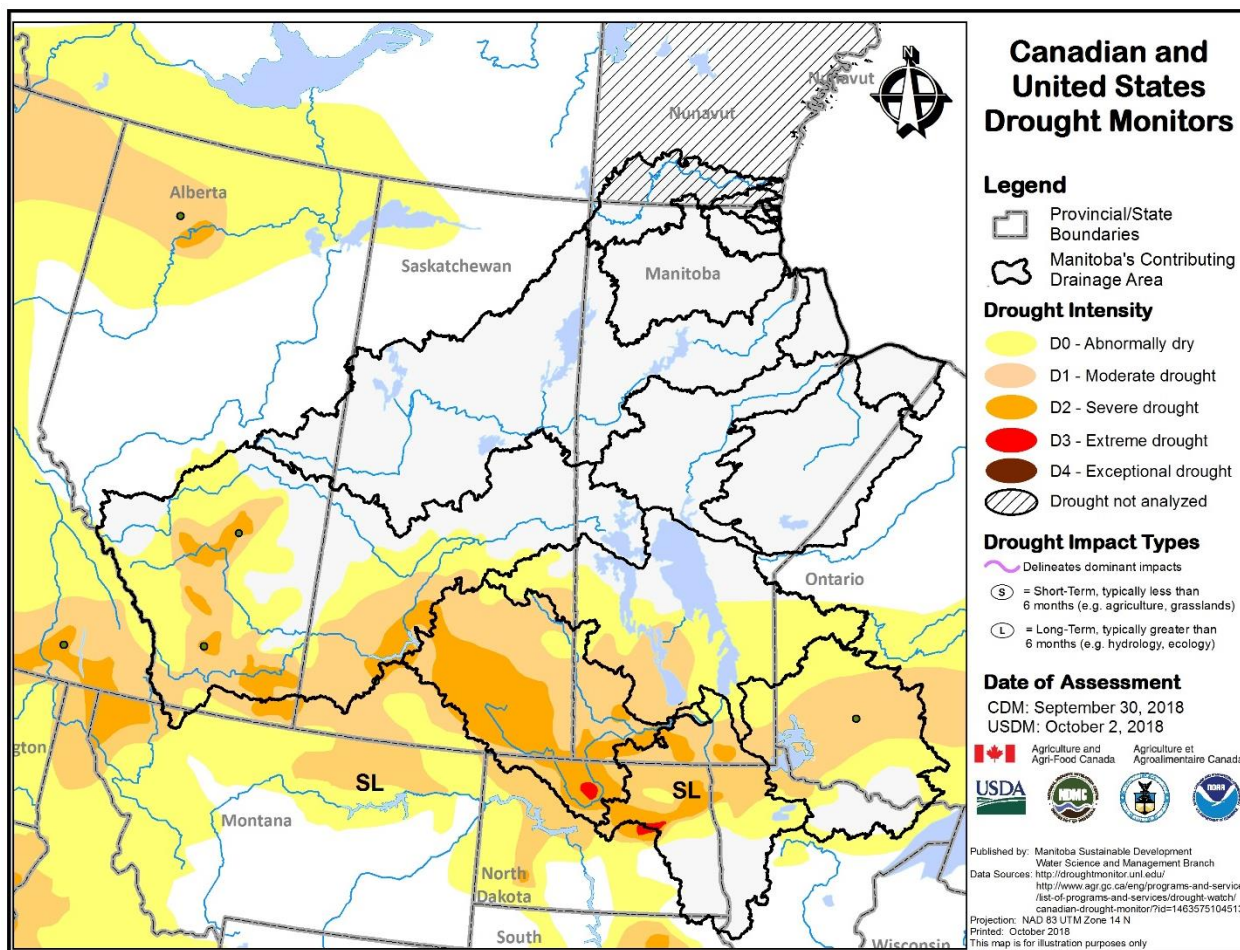


Figure 5: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of September 30, 2018.

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 1. 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 – October 1, 2018.								
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*	1,400.53	September 26, 2018	-1.97	300,000	275,754	92%
Lake Wahtopanah (Rivers)	Rivers	1,536*	1,533.79	October 1, 2018	-2.21	24,500	22,056	90%
Minnewasta (Morden)	Morden	1,082*	1,078.51	October 1, 2018	-3.49	3,150	2,605	83%
Stephenfield	Carman, Pembina Valley Water Co-op	972*	968.30	October 1, 2018	-3.70	3,810	2,360	62%
Vermilion	Dauphin	1,274*	1,269.57	October 1, 2018	-4.43	2,600	1,509	58%
Goudney (Pilot Mound)		1,482*	1,481.72	October 1, 2018	-0.28	450	430	96%
Jackson Lake		1,174*	1,168.59	October 1, 2018	-5.41	2,990	1,700	57%
Manitou (Mary Jane)		1,537*	1,531.76	October 1, 2018	-5.24	1,150	756	66%
Turtlehead (Deloraine)	Deloraine	1,772*	1,770.32	October 1, 2018	-1.68	1,400	1,309	94%
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	1,175.99	September 25, 2018	-2.01	3,800	2,796	74%
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 22 (October 1, 2018) are summarized in Table 2. If conditions were not described in Issue 22, the date corresponding to the most recently reported condition is provided in brackets.

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

Region	General Dugout Condition
Eastern	80 % adequate. Some dugouts are dry, remaining are ~20 % full.
Interlake	Dugouts low, at 0 – 30 % full, some dry (September 24).
Southwest	Dugouts 45 % full. Even though rain has occurred, in the driest areas, it is not enough to replenish low dugouts and sloughs.
Central	Dugouts 25 - 35 % full. Water quantity and quality classified as poor.
Northwest	Eastern part of the region: 20 – 40 % full, with some dugouts dried up. Western side of the region: 70 - 80 % full. (September 17)

Soil Moisture

Manitoba Agriculture’s mapping of topsoil (0 – 30 cm) conditions as of September 30, 2018 shows most of agro-Manitoba was experiencing adequate topsoil conditions, with regions of dry conditions, predominately in the southeast, south-central and north Interlake regions (Figure 6).

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

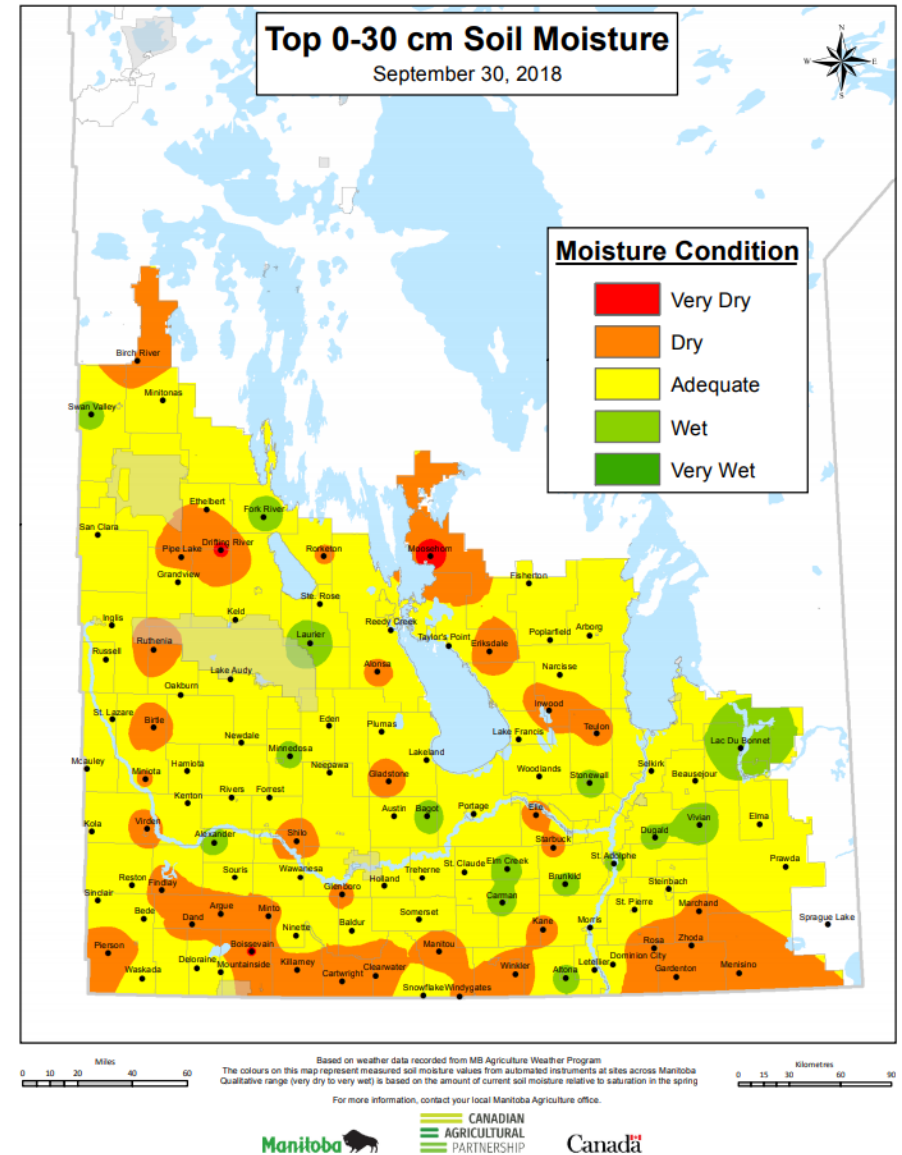


Figure 6: Manitoba Agriculture’s September 30, 2018 mapping of soil moisture conditions in the top 0 – 30 cm.

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

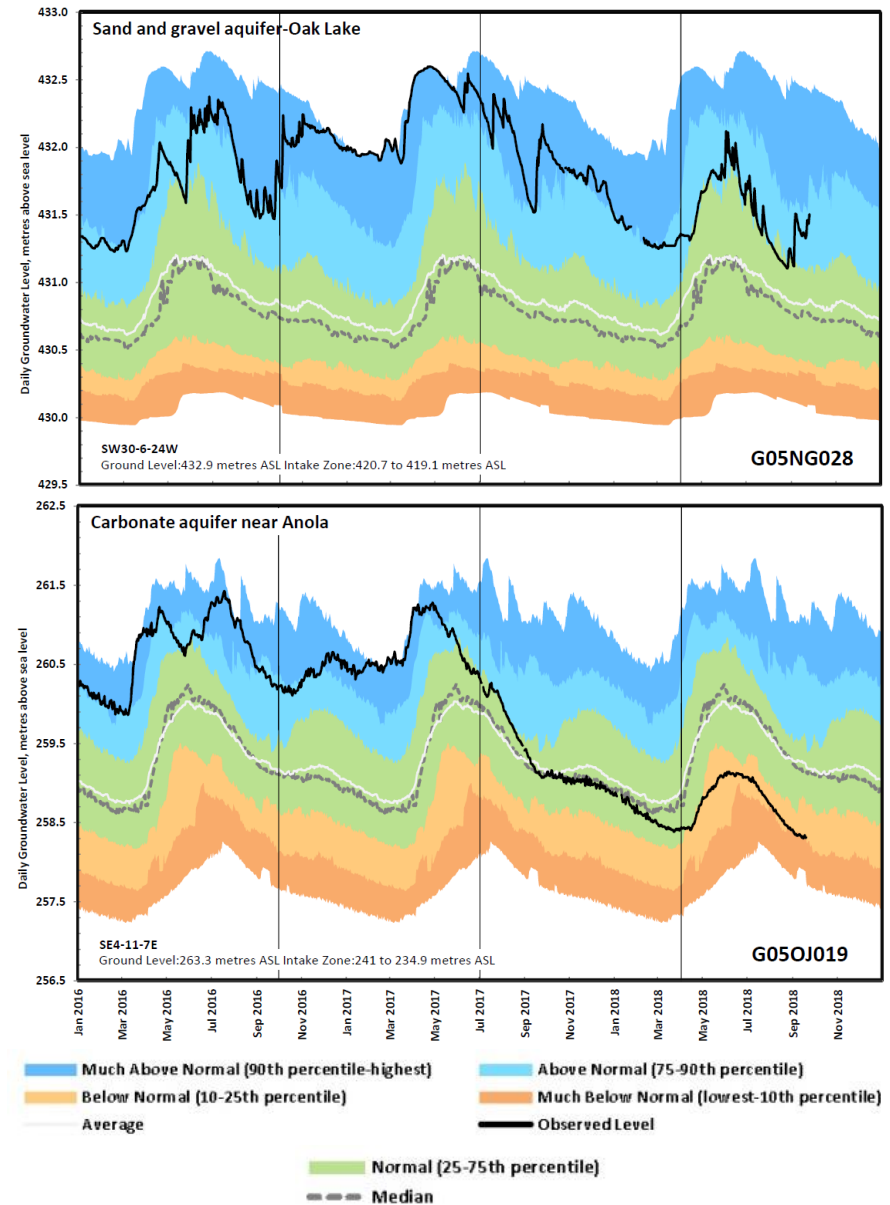
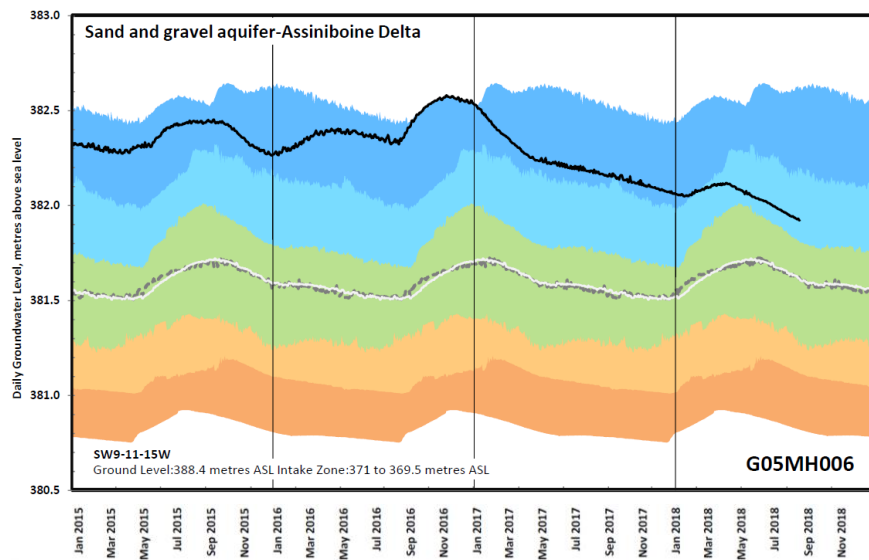


Figure 7: Groundwater hydrographs for the Assiniboine Delta aquifer (left), the Oak Lake aquifer (top), and the Carbonate aquifer near Anola (bottom).

Wildland Fires

As of October 1, 2018, the Provincial Wildfire Program reported 472 wildfires had occurred during the 2018 fire season with a total of 217,961 hectares burned overall. Approximately 7,170 hectares (3 % of total) were burned during the month of September, almost exclusively in the northeast region.

Although fire danger levels are low due to September precipitation, drought code values remain moderate to high through much of southern Manitoba (Figure 8).

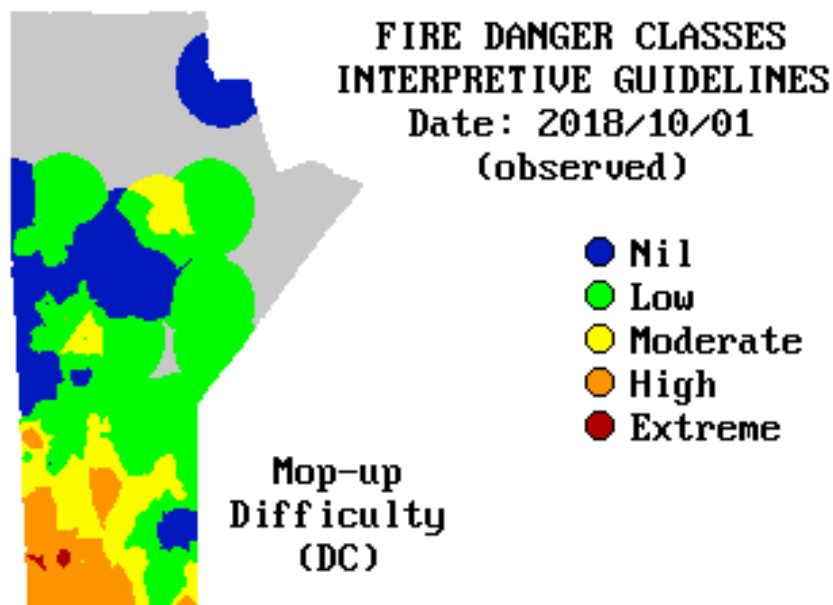


Figure 8: Fire danger mapping by the Manitoba Sustainable Development Wildfire Program.

Drought Impacts

Harvest is ongoing, but progress is slow due to rain and snow. Please refer to Manitoba Agriculture's [Crop Report](#) for preliminary information on yields. Yields throughout agro-Manitoba vary significantly due to variability in precipitation throughout the growing season.

Livestock feed supplementation is occurring on pastures as the cool weather has slowed growth. Manitoba Agriculture reported that inquiries regarding winter water and feed have decreased as producers are putting plans in place. However, some livestock producers continue to look for alternate feed sources to sustain their needs. [Manitoba Hay Listings](#) and [Pastures for Rent or Wanted](#) listings are available.

Dugout levels remain low across most of agro-Manitoba. On September 14, 2018, 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](#).

[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 (October-November-December) predicts temperatures will be above normal across Manitoba. Precipitation over the next three months is also forecasted to be above normal across most of the province.

The National Oceanic and Atmospheric Administration indicated that ENSO-neutral conditions are currently present. There is a 50 – 55 % chance that El Niño conditions will develop during the Northern Hemisphere fall 2018, increasing to a 65 – 70 % chance during winter 2018/19. During El Niño conditions, Manitoba can expect a warmer than average 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

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:

<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