

# Water Availability and Drought Conditions Report

OCTOBER 2018

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## Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for October 2018.
- Precipitation conditions over the past month, three month, and twelve month periods are as follows:
  - In October, the majority of the province observed normal (85 to 115 % of median) or above normal (> 115 % of median) precipitation. The region surrounding Swan River experienced extremely dry (< 40 % of median) conditions, with moderately dry (60 to 85 % of median) conditions extending northward to Flin Flon. Moderately dry conditions also occurred within the south Interlake region, and the area surrounding Island Lake. Portions of northern Manitoba saw conditions ranging from moderately to extremely dry.
  - Over the past three months, much of Manitoba observed normal precipitation. Regions of moderately dry conditions included most of southwest and northwest agro-Manitoba and a region extending northwest from Swan River to The Pas and Norway House. Russell and Grandview were severely (40 to 60 % of median) dry.
  - Over the past 12 months, most of southern Manitoba and the region surrounding Churchill 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 November 1, 2018, below normal (10<sup>th</sup> - 25<sup>th</sup> percentile) or much below normal (< 10<sup>th</sup> percentile) streamflows were observed on the Mossy, Souris, Whiteshell, Kettle and Hayes rivers. Below normal (14<sup>th</sup> percentile) water levels were observed on Lake Manitoba.
- Groundwater levels in major aquifers are generally in the normal range. Water levels in the Carbonate Aquifer near Anola continued to be below normal (10<sup>th</sup> - 25<sup>th</sup> percentile), but have been steadily increasing since mid-October.
- The Canadian Drought Monitor has downgraded the severity of drought conditions in southern Manitoba since the September 30, 2018 assessment by removing all pockets of D2 (severe drought). Southwest and central agro-Manitoba are now classified as D1 (moderate drought), with the remainder of agro-Manitoba classified as D0 (abnormally dry).
- There are currently no major concerns over reservoir water supplies. However, a few reservoirs such as Stephenfield Reservoir and Jackson Lake continue to be closely monitored due to below normal levels for this time of year.
- Manitoba Agriculture stated that dugout levels are generally 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](http://www.gov.mb.ca/agriculture) for more information.
- Environment and Climate Change Canada’s seasonal forecast for November-December-January projects temperatures to be above normal and precipitation 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.

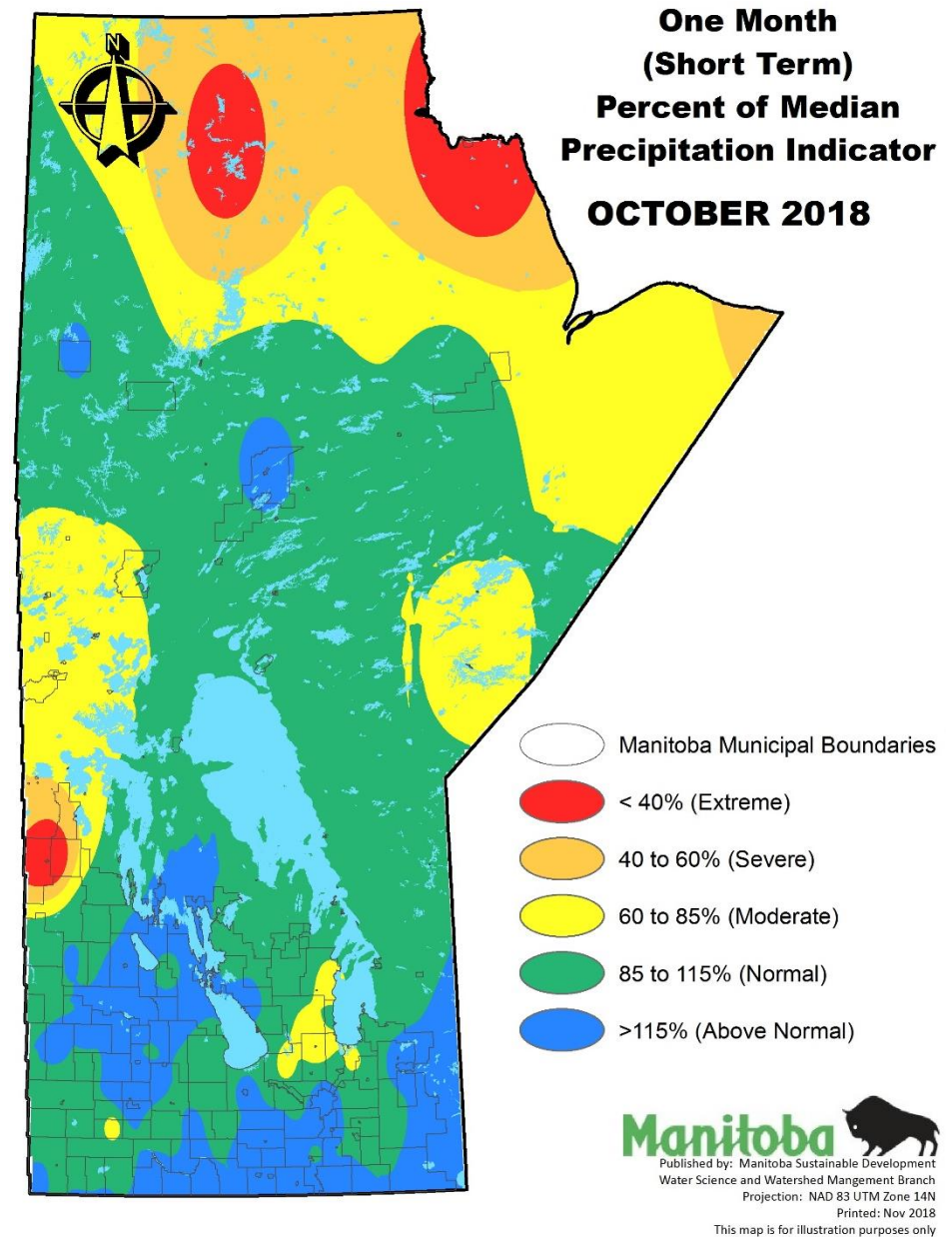


Figure 1: Short term (one month) per cent of median precipitation indicator.

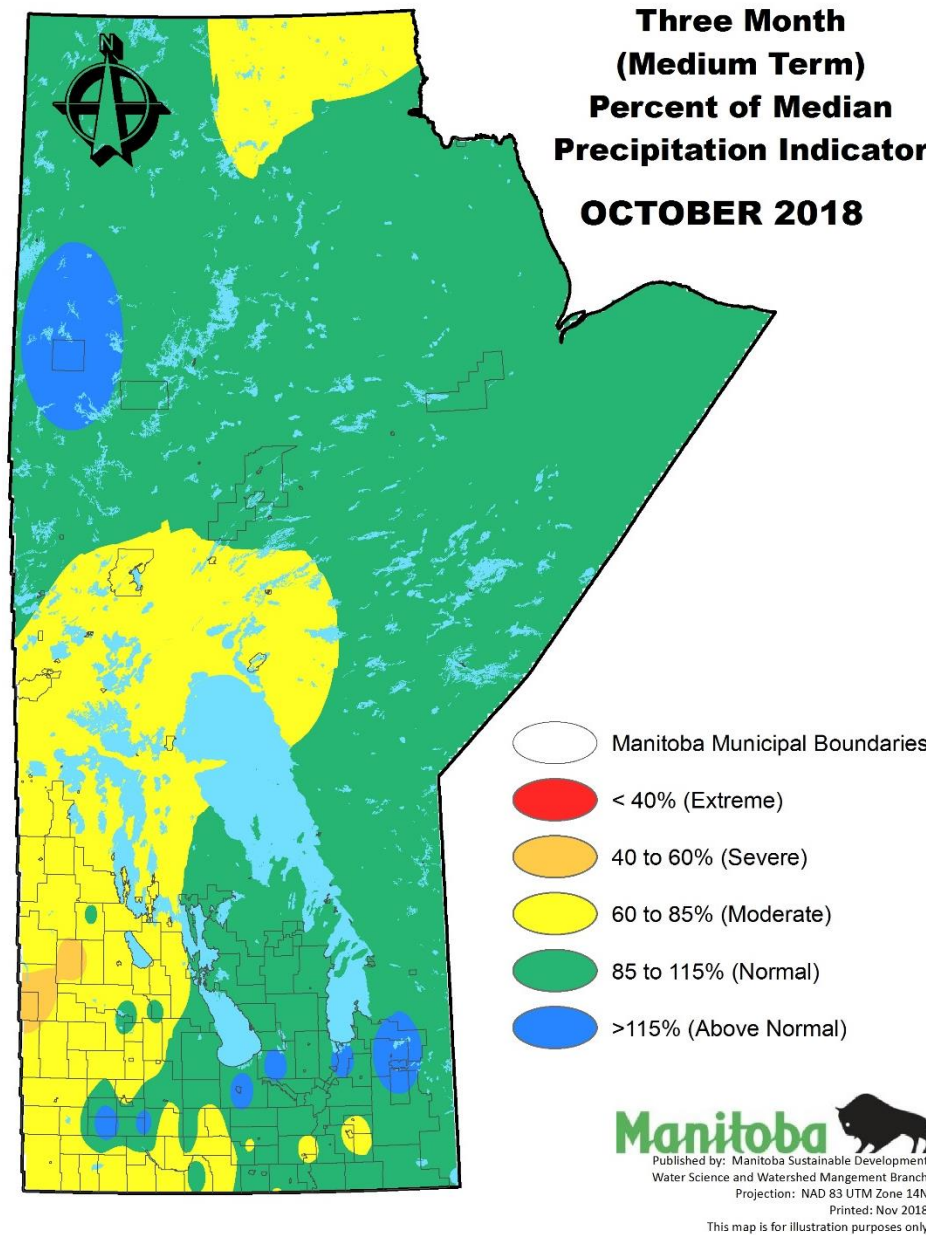


Figure 2: Medium term (three month) per cent of median precipitation indicator.

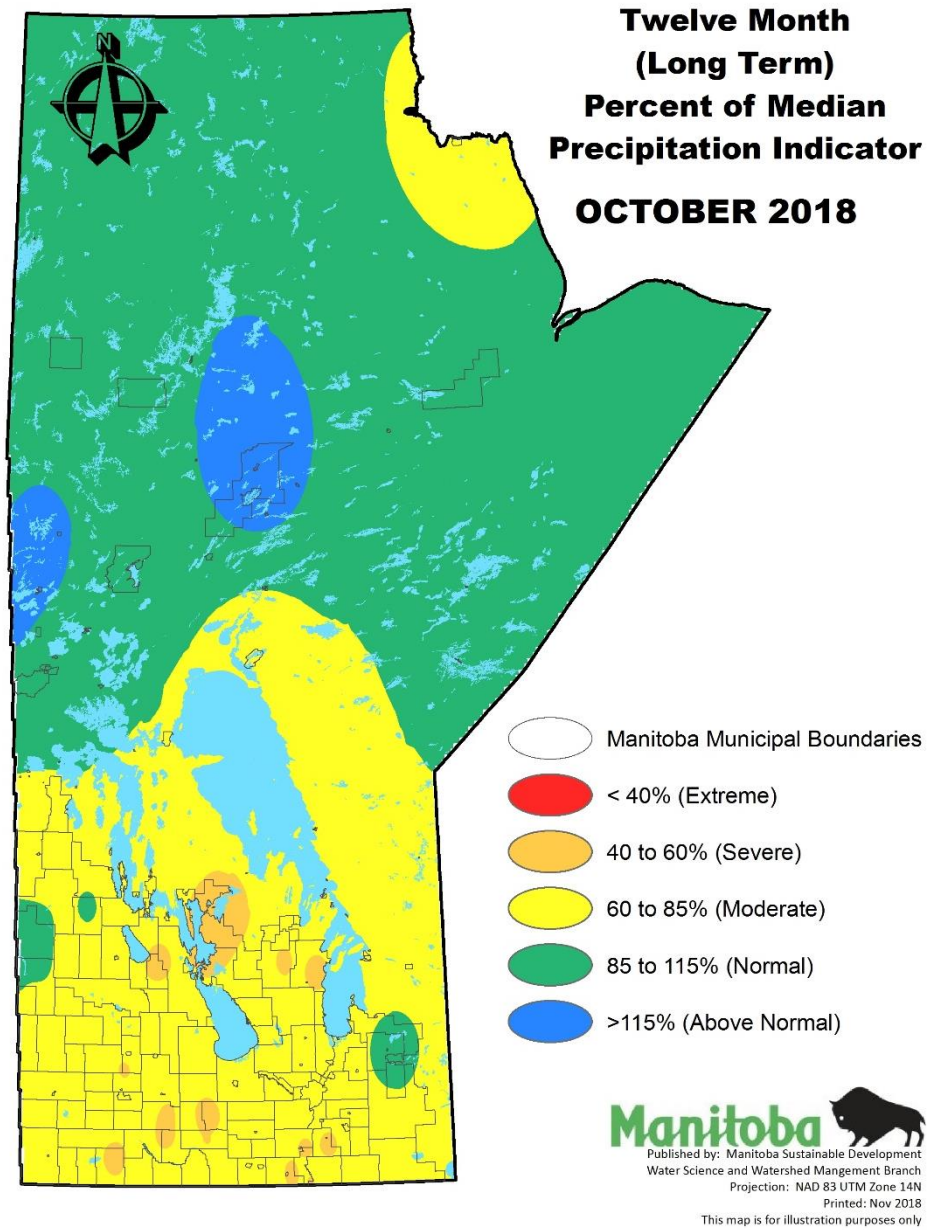


Figure 3: Long term (12 month) per cent of median precipitation indicator.

### 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 November 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.

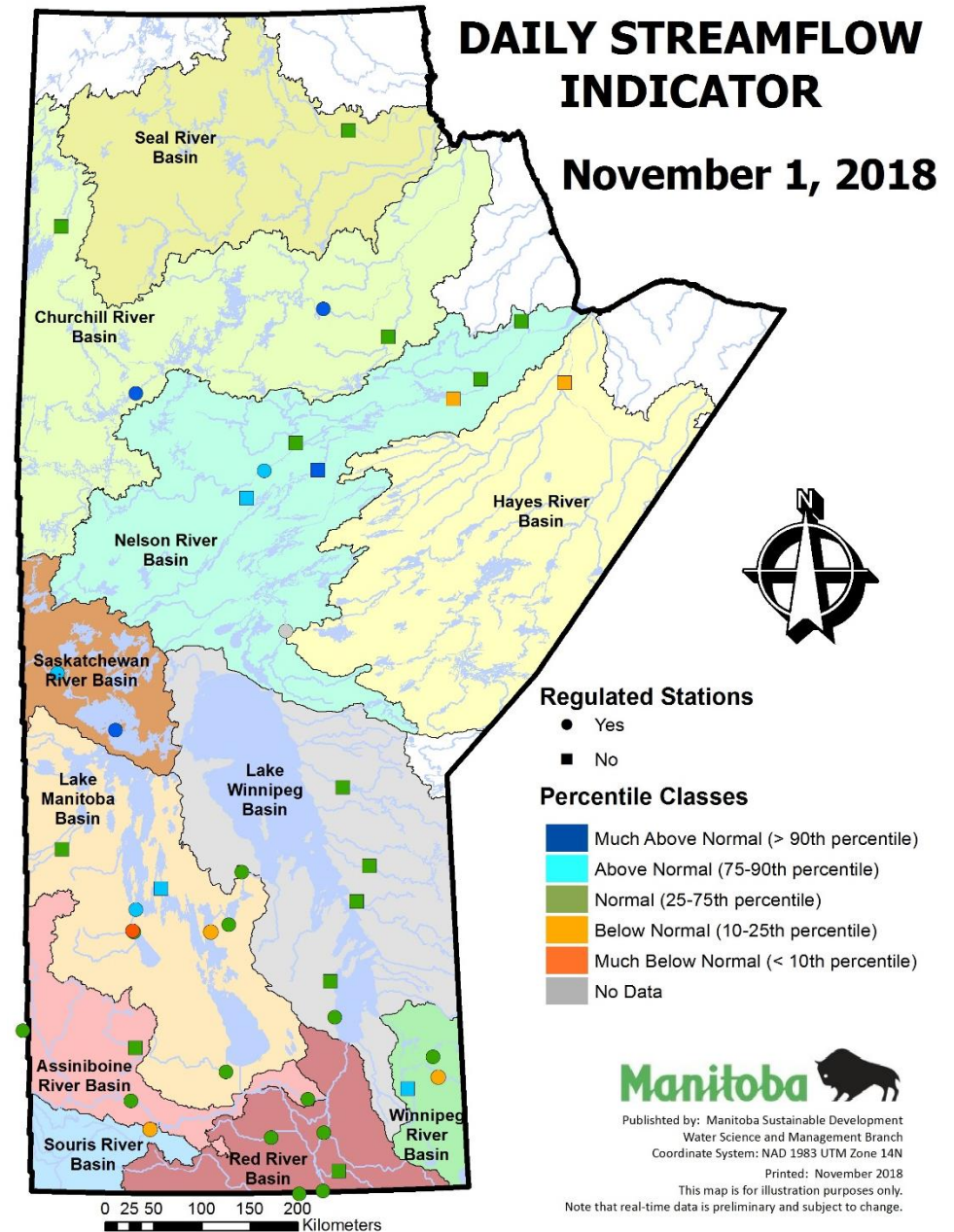


Figure 4: Daily streamflow and lake level indicator for November 1, 2018.

## 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).

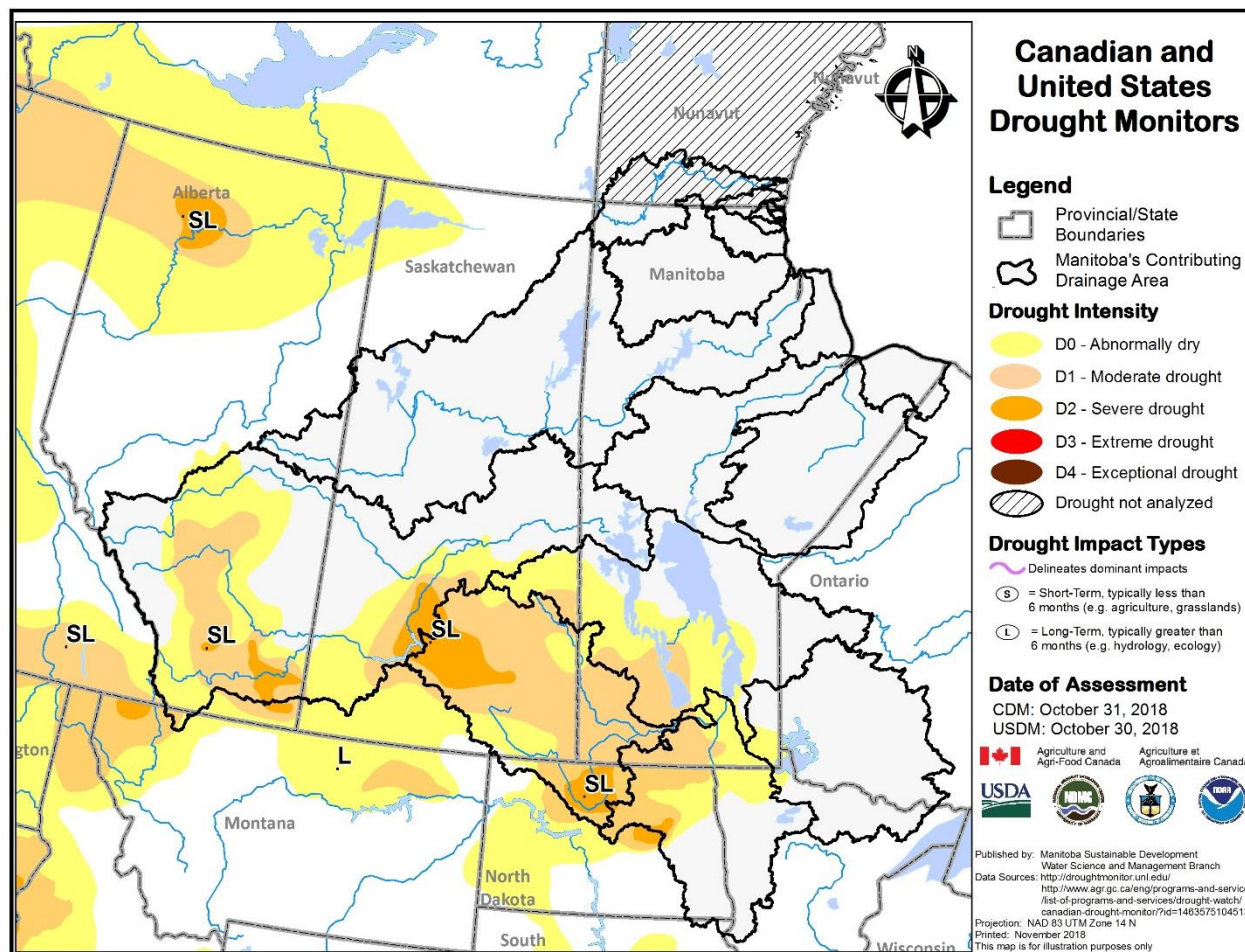


Figure 5: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of October 31, 2018.

## 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 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 – November 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) <sup>1</sup>	Brandon, Portage, Cartier Regional Water Co-op	1,402.5*	1,399.50	October 30, 2018	-3.00	300,000	263,122	88%
Lake Wahtopanah (Rivers)	Rivers	1,536*	1,535.02	November 2, 2018	-0.98	24,500	23,420	96%
Minnewasta (Morden)	Morden	1,082*	1,078.17	November 1, 2018	-3.83	3,150	2,556	81%
Stephenfield	Carman, Pembina Valley Water Co-op	972*	968.64	November 1, 2018	-3.36	3,810	2,497	66%
Vermilion	Dauphin	1,274*	1,274.08	November 2, 2018	0.08	2,600	2,618	101%
Goudney (Pilot Mound)		1,482*	1,481.79	November 2, 2018	-0.21	450	435	97%
Jackson Lake		1,174*	1,168.70	November 2, 2018	-5.30	2,990	1,725	58%
Manitou (Mary Jane)		1,537*	1,531.76	November 2, 2018	-5.24	1,150	756	66%
Turtlehead (Deloraine)	Deloraine	1,772*	1,770.02	November 2, 2018	-1.98	1,400	1,291	92%
Kenton Reservoir		1,448	1,447.08	October 17, 2018	-0.92	600	531	88%
Killarney Lake		1,615	1,615.32	October 16, 2018	0.32	7,360	7,506	102%
Lake Irwin		1,178	1,175.99	September 25, 2018	-2.01	3,800	2,796	74%
Elgin		1,532	1,531.00	October 31, 2018	-1.00	520	450	86%
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%

<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 Summary (October 29, 2018) are provided 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	Dugouts low, at 0 – 20 % full, some dry. Livestock water availability is rated at 80 % adequate, 20 % inadequate.
Interlake	Dugout levels are very low due to subsoil moisture levels. Water quality is variable. Livestock water availability is rated at 35 % adequate, 65 % inadequate.
Southwest	50 – 60 % capacity (October 22) Still low and will require normal snowfall and runoff to replenish.
Central	Dugouts 25 - 35 % full (October 22). Water quantity and quality classified as poor. Groundwater has declined, dugouts are lower than normal and many sloughs are drying up.
Northwest	Eastern part of the region: 60 – 70 % adequate. Western side of the region: adequate. (October 22)

## Soil Moisture

Manitoba Agriculture’s mapping of topsoil (0 – 30 cm) conditions as of October 28, 2018 shows most of agro-Manitoba was experiencing adequate topsoil conditions, with regions of dry conditions, predominately in the southeast, southwest and north Interlake regions (Figure 6). Pockets of wet conditions are present in central, northeast, and northwest agro-Manitoba.

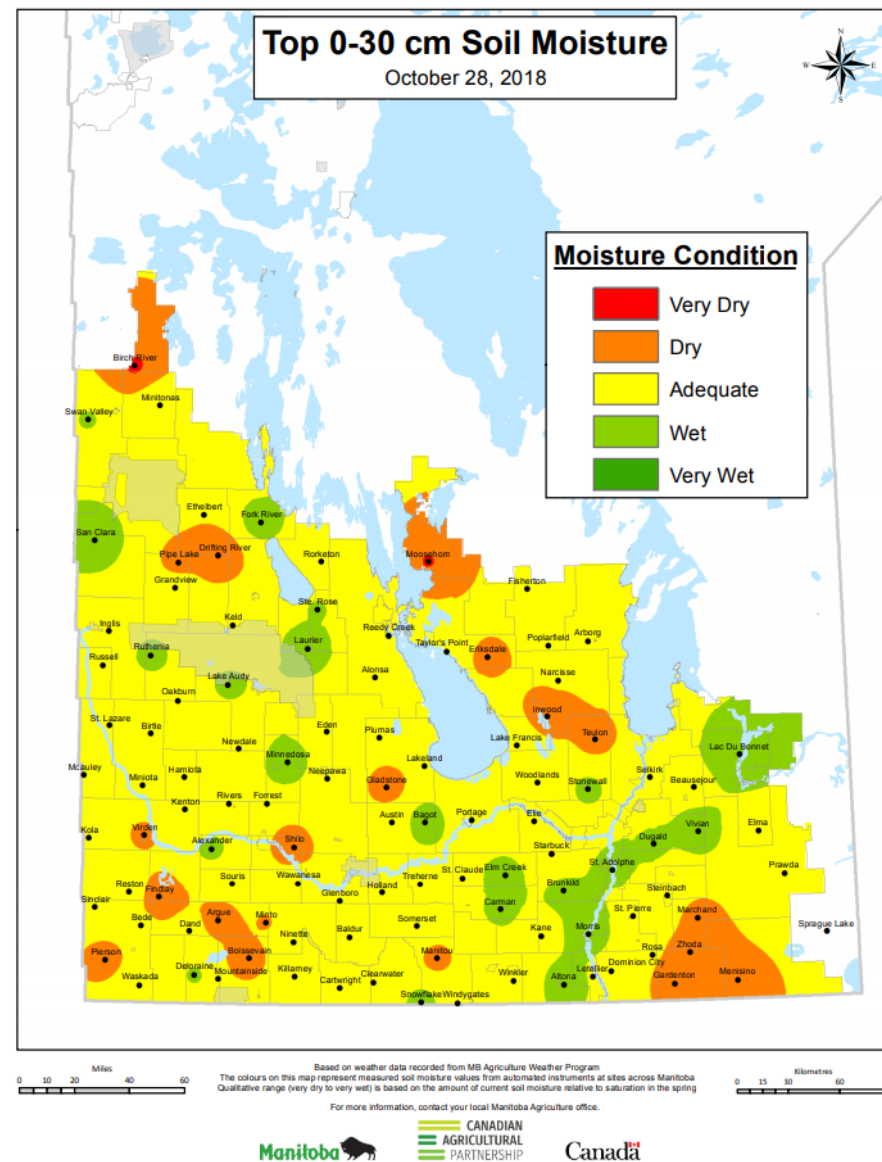


Figure 6: Manitoba Agriculture’s October 28, 2018 mapping of soil moisture conditions in the top 0 – 30 cm.

## 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 October 2018 for the Assiniboine Delta aquifer, the Oak Lake aquifer, and the Carbonate aquifer near Anola are provided on Figure 7.

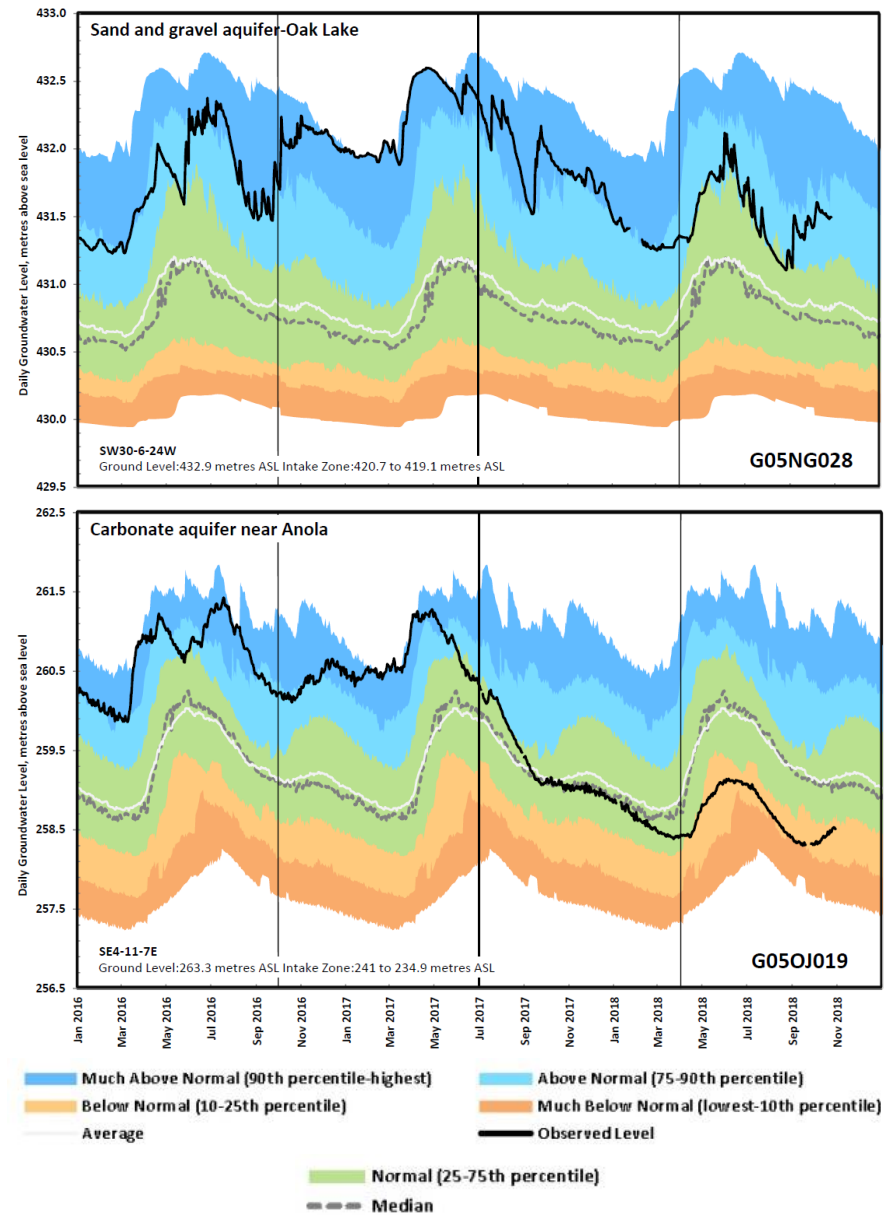
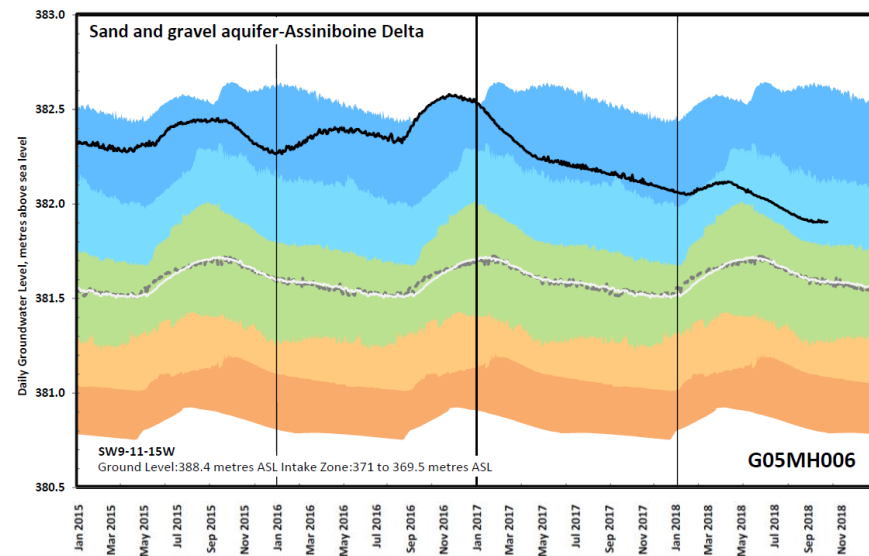


Figure 7: Groundwater hydrographs for the Assiniboine Delta aquifer (left), the Oak Lake aquifer (top), and the Carbonate aquifer near Anola (bottom).



## Drought Impacts

As of October 29, harvest was classified as 97 % complete. Please refer to Manitoba Agriculture's [Crop Report: Seasonal Summary](#) for specific information on yields. Yields throughout agro-Manitoba vary significantly due to variability in precipitation throughout the growing season.

Generally hay fields are in poor to fair condition and many livestock producers are facing inadequate feed supplies. Some pastures are overgrazed, putting producers in a tough position for spring 2019. Producers with reduced winter feed supplies continue to look for alternate feed sources to sustain their needs. [Manitoba Hay Listings](#) are available. Some cattle producers will downsize their herds due to the feed shortage.

Dugout levels remain low across most of agro-Manitoba and in many regions supplies have been classified as inadequate. 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](#). The October 22 Crop Report indicated that interest in this funding program has been significant.

[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.

Throughout 2018, 472 wildfires burned a total of 219,087 hectares. Based on the total area burned, this represents 108 % of normal (based on 105 years of data).

## Future Weather

Environment and Climate Change Canada's seasonal forecast for the next three months (November-December-January) 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 ENSO-neutral conditions are currently present. There is a 70 – 75 % chance that El Niño conditions will develop over the next few months and continue throughout the Northern Hemisphere 2018/19 winter. 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:**

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This report was prepared with information from the following sources which are gratefully acknowledged:

**Manitoba Infrastructure** - Reservoir level information:

[http://www.gov.mb.ca/mit/floodinfo/floodoutlook/river\\_conditions.html](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](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:**

<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/](http://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)