

Water Availability and Drought Conditions Report

JUNE 2018

Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for June 2018. Although June rains helped lessen drought conditions, some regions of agro-Manitoba are still experiencing dryness and would benefit from additional rain.
- Precipitation Conditions:
 - During June, most of Manitoba received normal (85 – 115 % of median) to above normal (> 115 %) rainfall, except for moderate (60 – 85 %) to extremely (< 40 %) dry conditions in the Interlake, moderate to severely (40 to 60 %) dry conditions in parts of southeastern agro-Manitoba, and isolated pockets of dryness surrounding McCreary (severely dry) and Cypress River (moderately dry).
 - Over the past three months, precipitation conditions were highly variable. Most of southern Manitoba experienced moderately to severely dry precipitation conditions, with the Interlake observing regions of extreme dryness. Conversely, the western portion of agro-Manitoba observed normal to above normal precipitation. Northern Manitoba was generally normal or above normal, with moderately dry conditions surrounding Gillam, Churchill and north of Flin Flon.
 - Over the past 12 months, most of southern Manitoba and an area extending just south of Thompson and east to Island Lake observed moderately dry conditions, with some areas of severely dry conditions in the Interlake. The remainder of the province, including regions in the southeast and southwest corners, observed normal precipitation conditions during this period.
- Streamflows or lake levels in nine of the 43 monitored streams and lakes were below normal (10th - 25th percentile) or much below normal (< 10th percentile) as of June 28th, 2018. Below normal streamflows were observed on the Pembina, Boyne, Mossy, Winnipeg, Icelandic, Bloodvein and Kettle rivers and below normal water levels were observed on Lake Winnipeg and Round Lake. Streamflow or lake levels were normal or above normal in all other rivers and lakes monitored.
- Groundwater levels in major aquifers are generally good. However, below normal water levels were observed in the Carbonate Aquifer near Anola during June 2018.
- The Canadian Drought Monitor classifies approximately half of Manitoba as D0 (abnormally dry conditions) as of June 30th, 2018. A region of D1 (moderate drought) is located in the central and Interlake regions of agro-Manitoba, with some pockets of D2 (severe drought).
- There are currently no major concerns over reservoir water supplies. Manitoba Agriculture Crop Reports stated that on farm water supplies are generally adequate in most areas. Some dugouts are reported to be 25 % full in the Interlake.
- Wildfires burned ~22,000 hectares during the month of June, primarily in northeastern Manitoba. Suppression activities continue on a large fire near Lynn Lake. Evacuation orders have been lifted for the community of Lynn Lake and Marcel Colomb First Nation.
- Environment and Climate Change Canada's seasonal forecast for July-August-September projects temperatures to be above normal across most of Manitoba, except for a region in the north. Precipitation over the next three months is forecasted to be below normal within the southwest quadrant of the province 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.

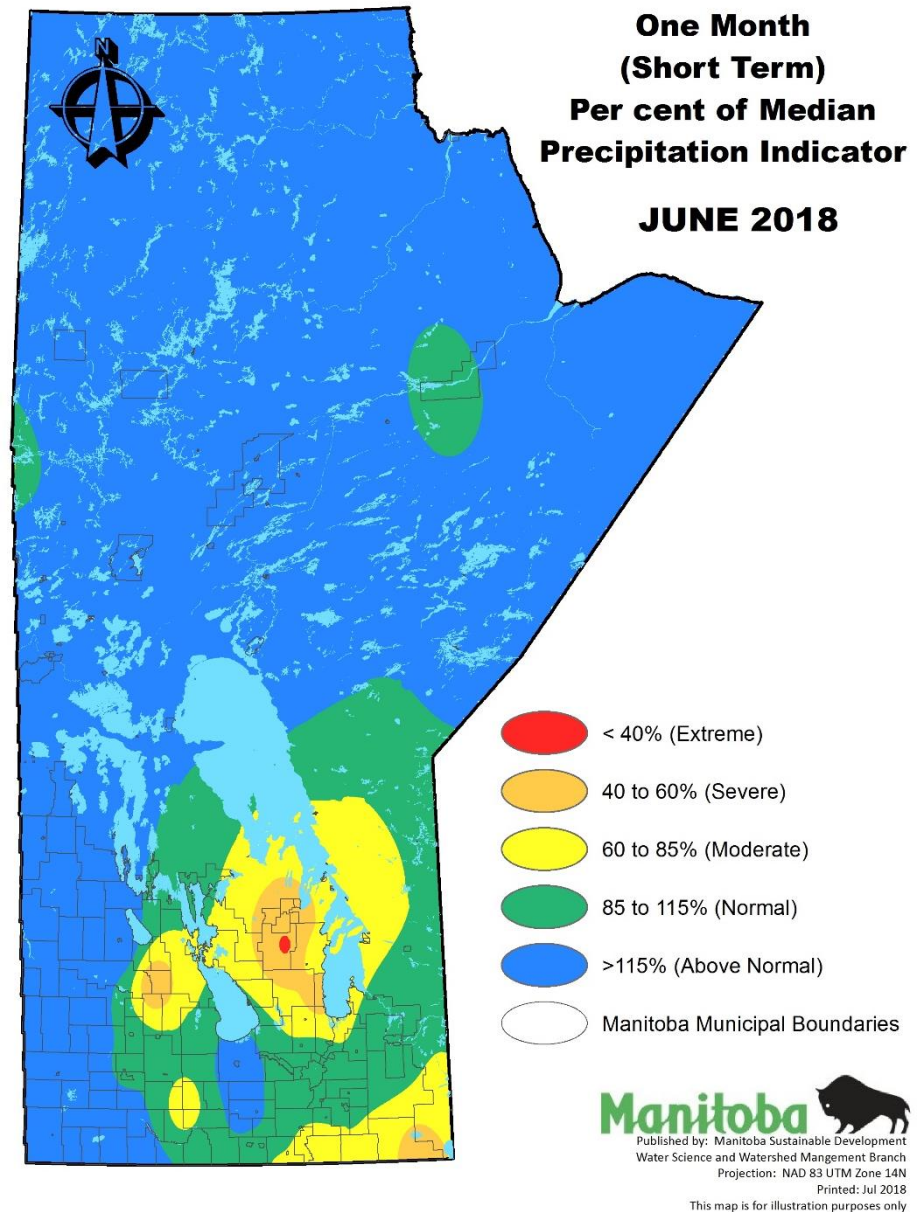


Figure 1: Short term (one month) per cent of median precipitation indicator.

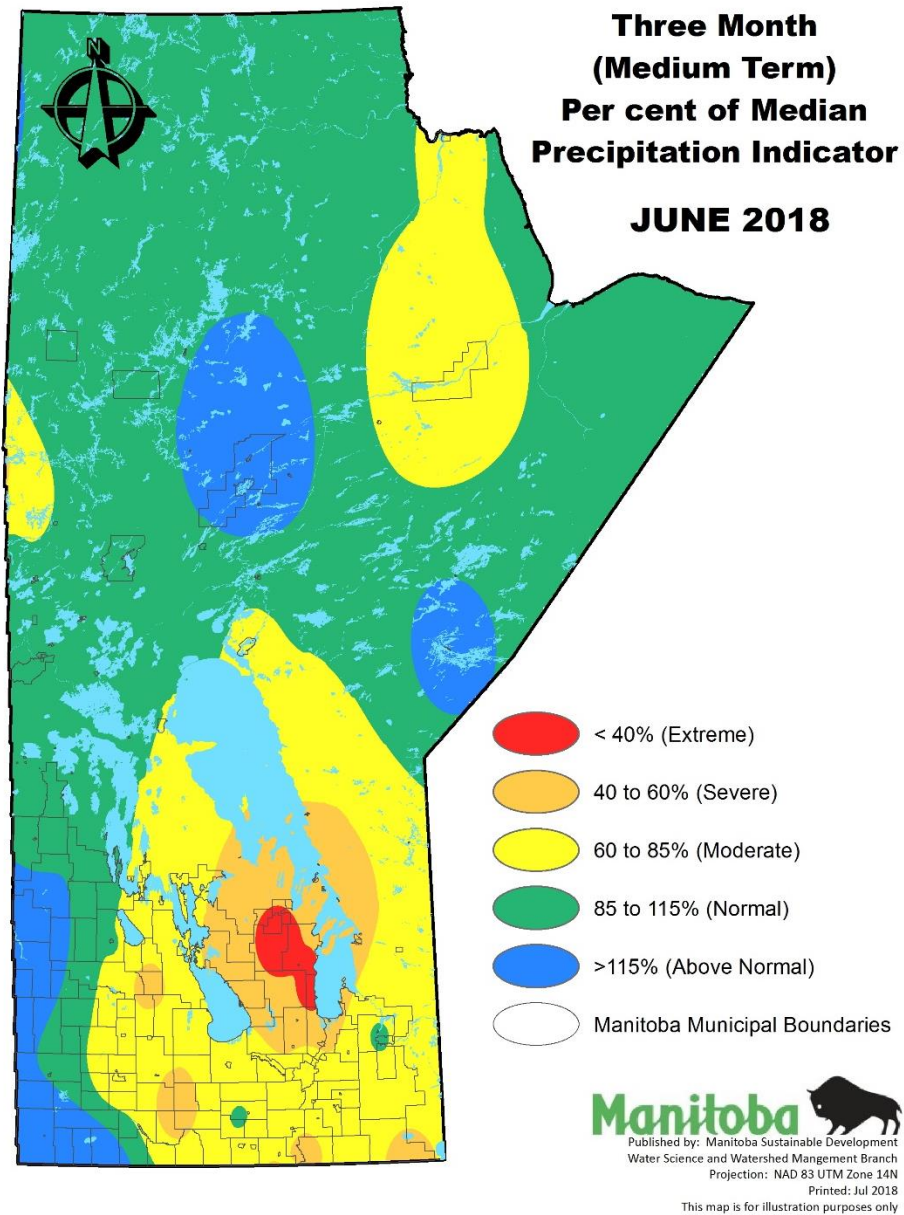


Figure 2: Medium term (three month) per cent of median precipitation indicator.

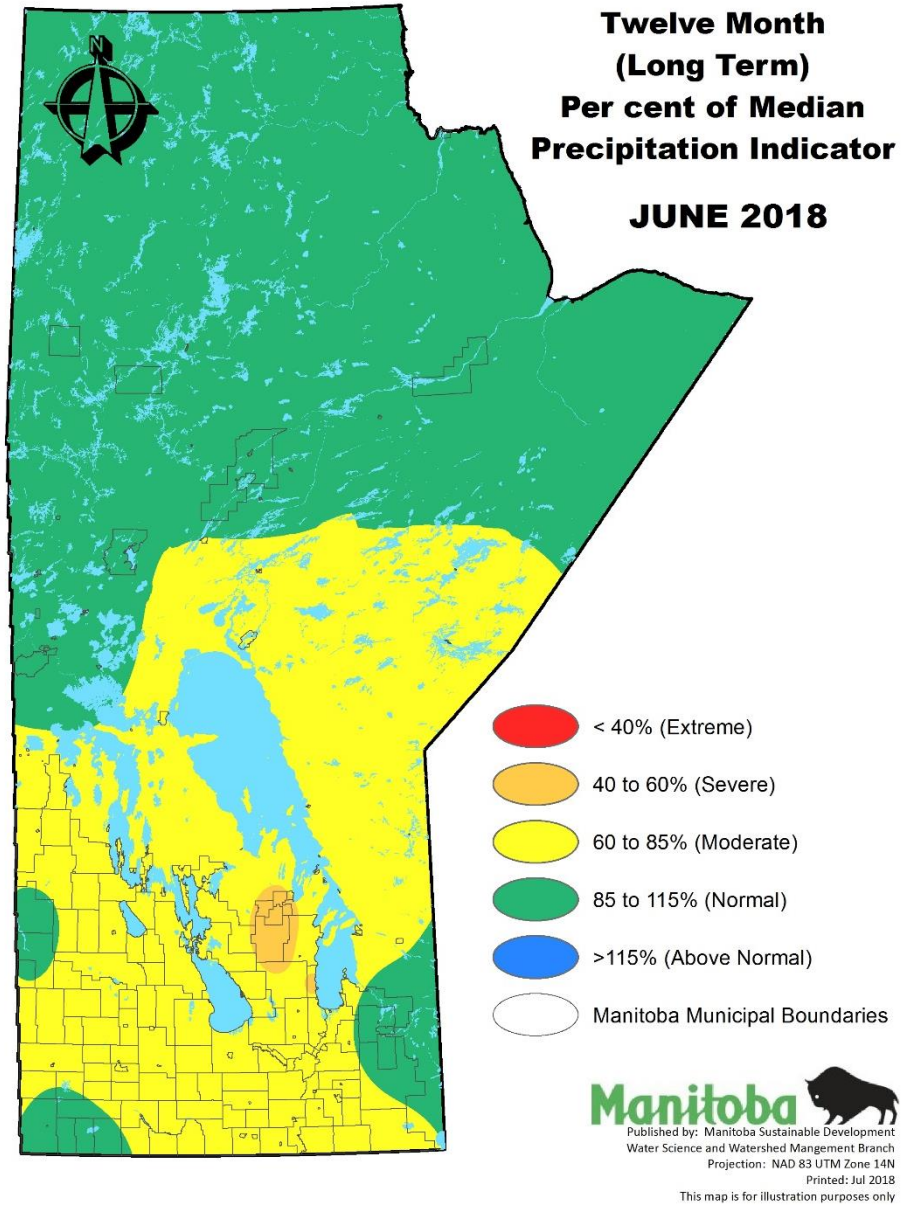


Figure 3: Long term (12 month) per cent of median precipitation indicator.

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 June 28th, 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.

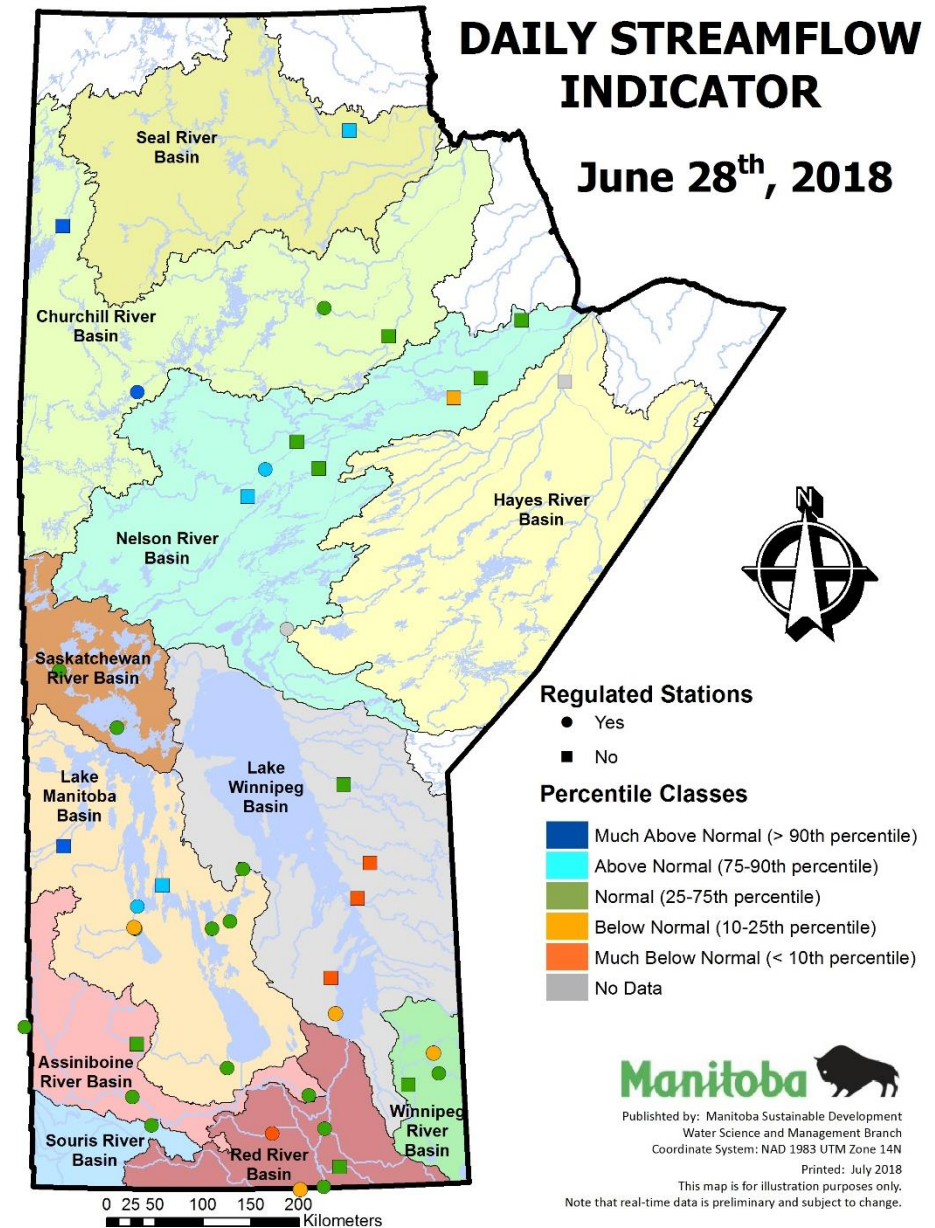


Figure 4: Daily streamflow and lake level indicator for June 28th, 2018.

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).

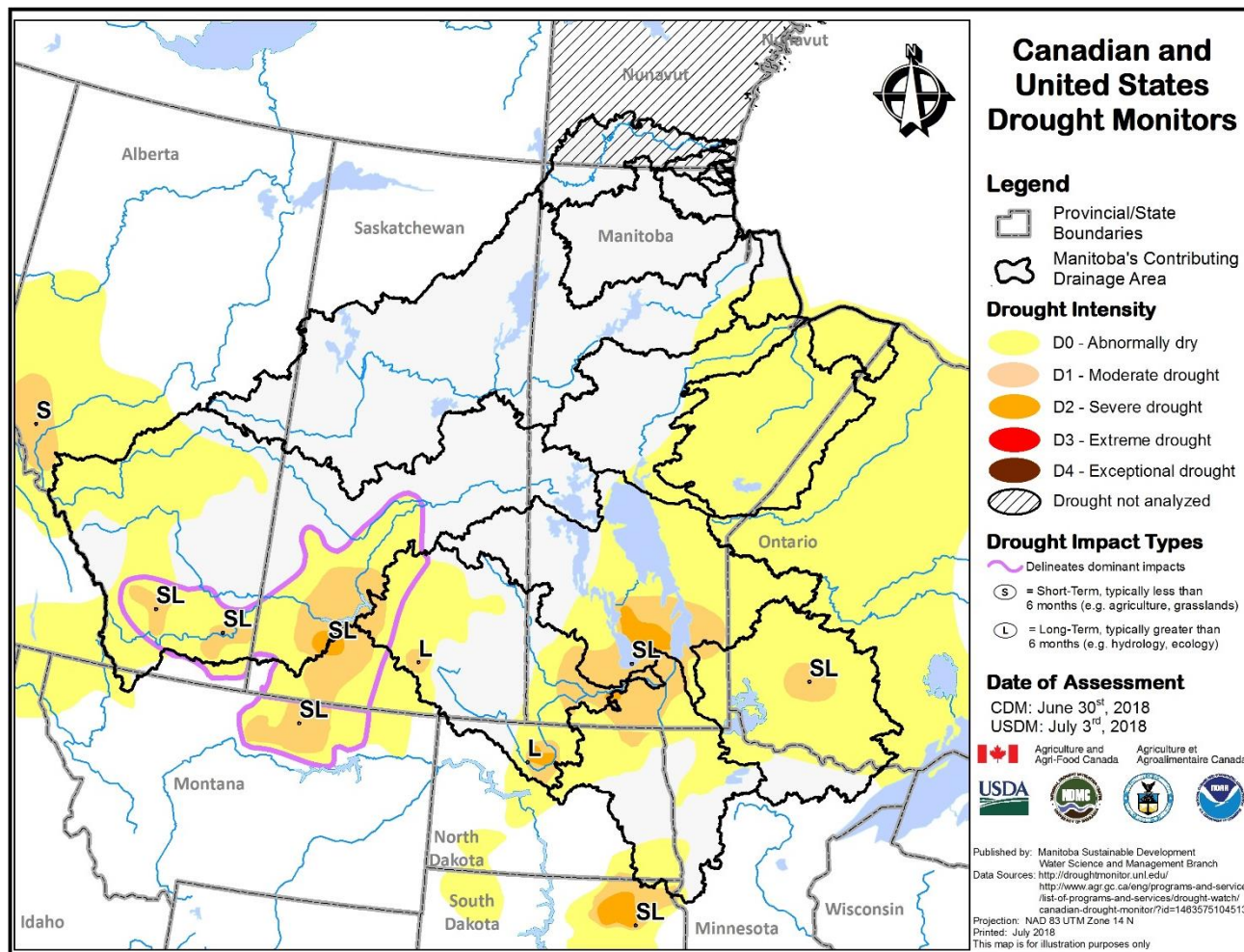


Figure 5: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of June 30th, 2018.

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 – June 28 th , 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*	1,404.12	June 28, 2018	1.62	300,000	322,495	107%
Lake Wahtopanah (Rivers)	Rivers	1,536*	1,536.49	June 28, 2018	0.49	24,500	25,606	105%
Minnewasta (Morden)	Morden	1,082*	1,081.15	June 28, 2018	-0.85	3,150	3,008	96%
Stephenfield	Carman	972*	972.07	June 28, 2018	0.07	3,810	3,845	101%
Vermilion	Dauphin	1,274*	1,274.49	June 28, 2018	0.49	2,600	2,715	104%
Goudney (Pilot Mound)		1,482*	1,482.06	June 28, 2018	0.06	450	453	101%
Jackson Lake		1,174*	1,171.49	June 28, 2018	-2.51	2,990	2,368	79%
Manitou (Mary Jane)		1,537*	1,536.92	June 28, 2018	-0.08	1,150	1,143	99%
Turtlehead (Deloraine)	Deloraine	1,772*	1,771.90	May 31, 2018	-0.10	1,400	1,395	100%
Kenton Reservoir		1,448	1,448.02	May 10, 2018	0.02	600	601	100%
Killarney Lake		1,615	1,615.20	May 8, 2018	0.20	7,360	7,452	101%
Lake Irwin		1,178	1,178.14	June 19, 2018	0.14	3,800	3,889	102%
Elgin	Elgin	1,532	1,532.05	May 11, 2018	0.05	520	523	101%
Rapid City		1,573.5	1,574.37	May 10, 2018	0.87	200	261	130%
St. Malo		840	840.59	May 24, 2018	0.59	1,770	1,868	106%

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 9 (July 3rd, 2018) are summarized in Table 2. If conditions were not described in Issue 9, 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	50 % full
Interlake	Adequate – although some dugouts are only 25 % full
Southwest	80 % capacity
Central	Adequate at this time
Northwest	75 to 100 % full

Soil Moisture

Manitoba Agriculture’s mapping of topsoil (0 – 30 cm) conditions as of July 2nd, 2018 shows most of agro-Manitoba was experiencing adequate to dry topsoil conditions with some isolated pockets of wet conditions (Figure 6).

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

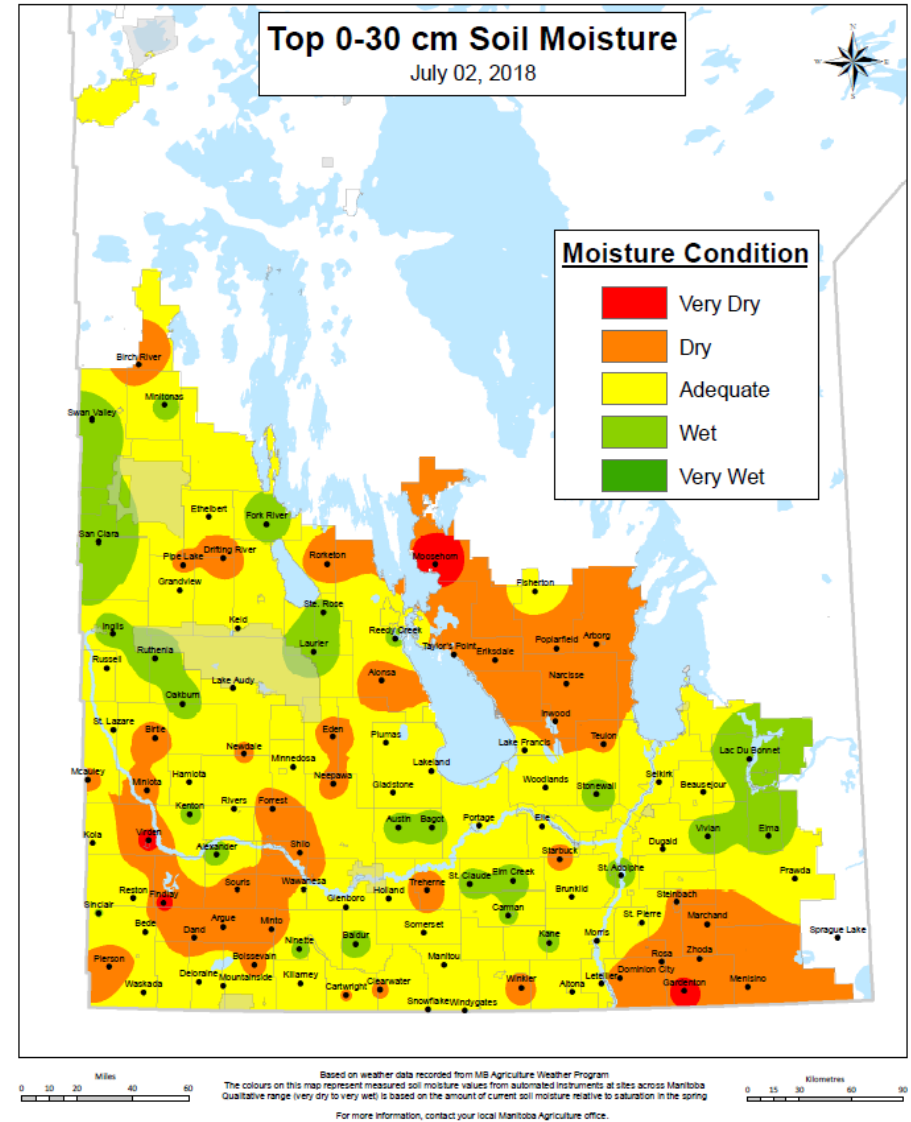


Figure 6: Manitoba Agriculture’s July 2nd, 2018 mapping of soil moisture conditions in the top 0 – 30 cm.

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

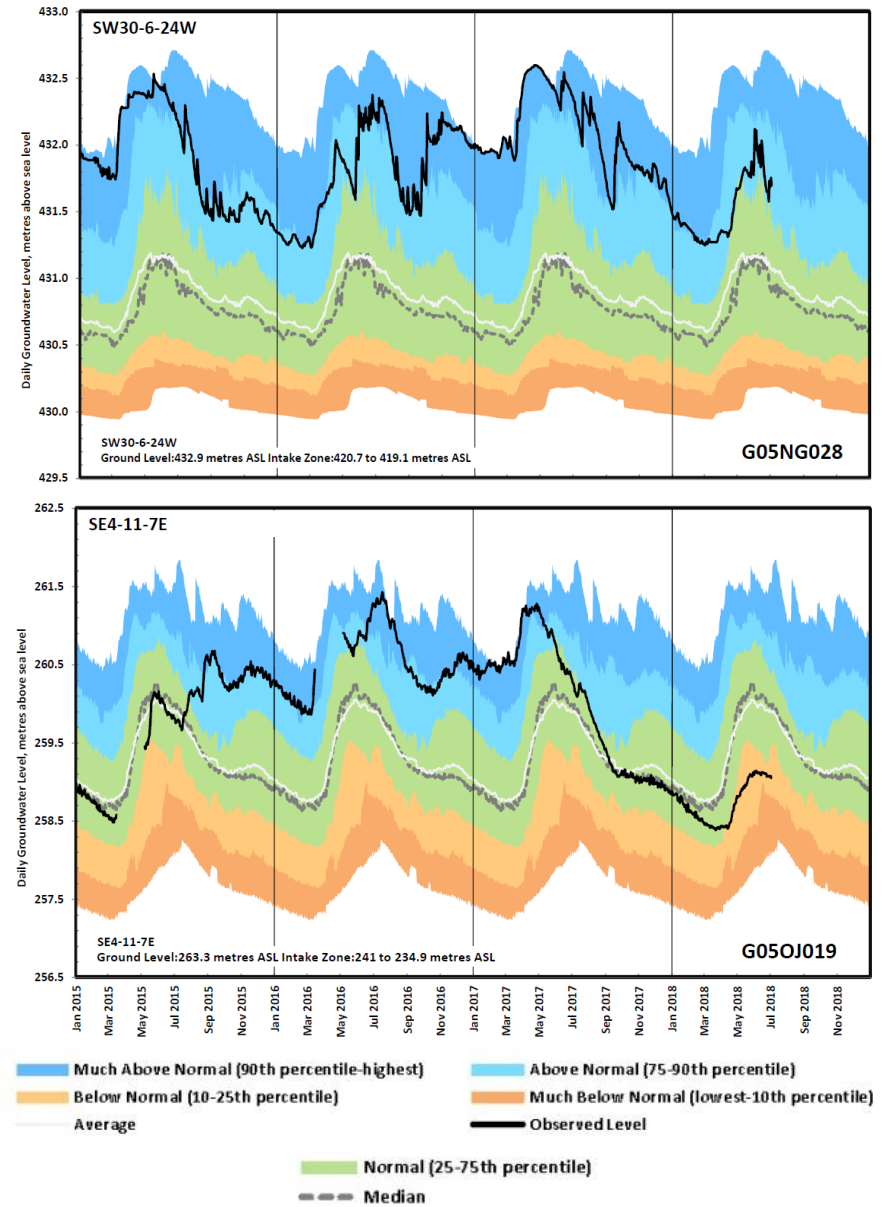
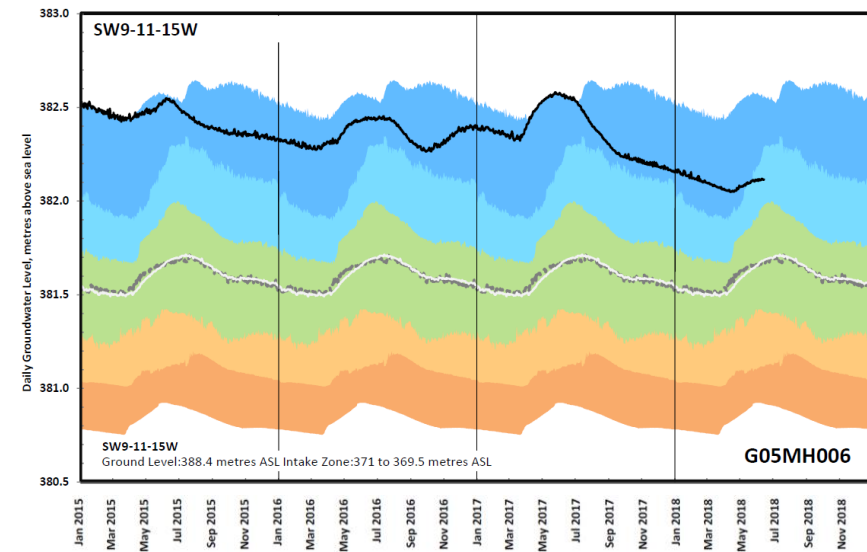


Figure 7: Groundwater hydrographs for the Assiniboine Delta aquifer (left), the Oak Lake aquifer (top), and the Carbonate aquifer near Anola (bottom).

Wildland Fires

As of June 30th, 2018, the Provincial Wildfire Program reported 295 wildfires had occurred during the 2018 fire season, which is well above the average of 210. A total of 91,275 hectares have been burned. Approximately 20,000 hectares (22 % of total hectares burned) were burned during the month of June, primarily in the northeast region. As of July 1st, suppression activities continued on a large fire near Lynn Lake.

As of July 1st, 2018, fire danger (Figure 8) is low across Manitoba. There are currently no burning bans in place.

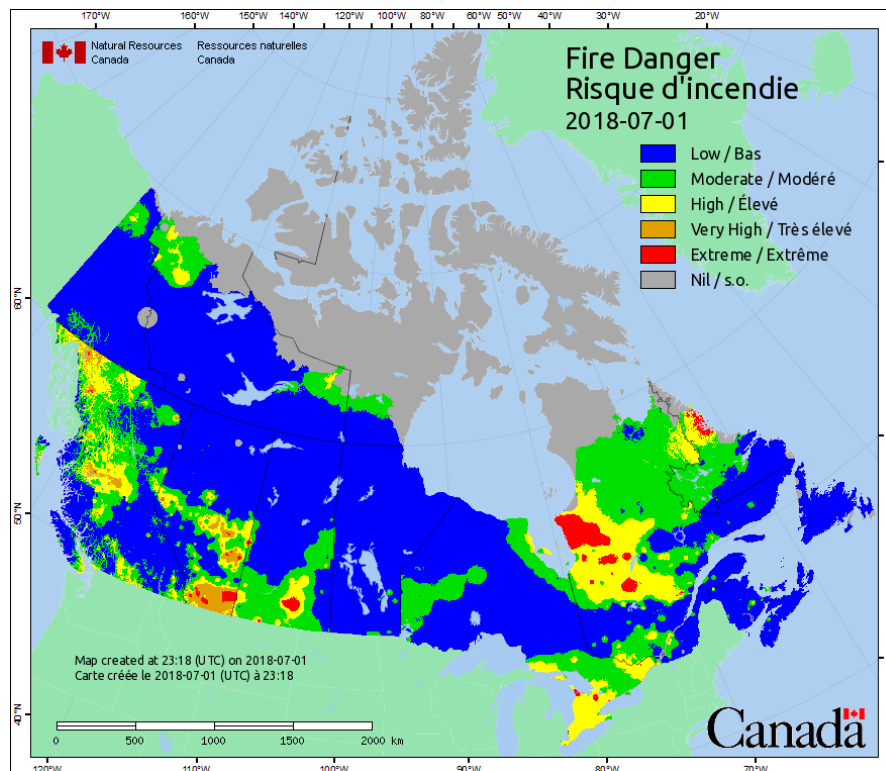


Figure 8: Fire danger mapping by Natural Resources Canada.

Drought Impacts

On June 23rd, 2018 a fire caused by lightning started approximately 20 km southeast of Lynn Lake and by the next day it had pushed 8 km toward Marcel Colomb First Nation. An evacuation of all residents from Marcel Colomb First Nation was completed by June 26th. Additionally a voluntary evacuation of Lynn Lake was called for residents with chronic health or breathing difficulties, pregnant women or infant children. As of July 1st, the evacuation orders had been lifted.

Manitoba Agriculture published [Crop Report: Issue 9](#) on July 3rd, 2018. It is reported that warm conditions and rainfall over the past week were welcomed and have advanced crop development. However, the Interlake region reports many crops are shorter than normal due to extended dry periods. First cut of hay/alfalfa is complete or underway with lower than average yields being reported due to the dry conditions at the start of the season. Pastures and hay/alfalfa have good regrowth where rainfall occurred. However some pastures and hay/alfalfa are rated to be in poor condition in the central, eastern and Interlake regions due to lack of moisture.

Future Weather

Environment and Climate Change Canada's seasonal forecast for the next three months (July-August-September) projects temperatures to be above normal across most of Manitoba, particularly in the south. Precipitation over the next three months is forecasted to be below normal within the southwest quadrant of the province and normal throughout the remainder of Manitoba.

The National Oceanic and Atmospheric Administration indicates that ENSO-neutral conditions are currently present and are favoured through Northern Hemisphere during summer 2018. There is a 50 % chance that El Niño conditions will develop during fall 2018, increasing to a 65 % 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