Water Availability and Drought Conditions Report

APRIL 2018

Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for April 2018. Much of Manitoba is experiencing dryness and precipitation would be beneficial to prevent the severity and extent of drought impacts.
- Precipitation Conditions:
  - During April, most of southern Manitoba experienced extremely dry (<40 % of median) conditions, with some locations not receiving any rainfall during this period. The remainder of the province observed severely (40 to 60 %) to moderately (60 to 85 %) dry conditions, giving way to normal conditions in the north.
  - Over the past three months, most of the province observed moderately to severely dry conditions. The southeast portion of the province and a region centered over Swan River observed extremely dry conditions.
  - Over the past 12 months, the southern portion of the province and an area extending north to Thompson and east to Island Lake observed moderately dry conditions, with some areas of severely dry conditions in the Interlake, in the northwest agro-region, and isolated regions centered over Morden, Carman and Emerson. The remainder of the province observed normal precipitation conditions during this period.
- Most streamflows and lake levels across southern Manitoba were normal or above normal on April 29th, 2018. Below normal conditions were observed within the east portion of the Lake Winnipeg Basin, the Whitemouth River, the Winnipeg River, and the Cochrane and Limestone Rivers in northern Manitoba.
- Groundwater levels in major aquifers are generally good. The Carbonate Aquifer near Anola observed below normal levels during April 2018.
- The Canadian Drought Monitor classified much of agro-Manitoba as D1 (moderate drought) to D2 (severe drought) conditions as of April 30th, 2018. The remainder of southern Manitoba and the northeastern portion of the province are classified as D0 (abnormally dry).
- There are currently no major concerns over reservoir water supplies. The May 7th, 2018 Crop Report stated that on farm water supplies are generally adequate although spring runoff was limited.
- Dry and windy conditions have resulted in “out of control” wild fires in southeastern Manitoba and in the Interlake, destroying several homes. Fire danger is classified as extreme for most of southern Manitoba, and burning bans remain in place.
- Environment and Climate Change Canada’s seasonal temperature forecast for May-June-July projects temperatures to be above normal. Precipitation over the next three months is forecasted to be below normal in the southwest portion of the province.
- For more information on drought in Manitoba, please visit the Manitoba Drought Monitor website.

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.

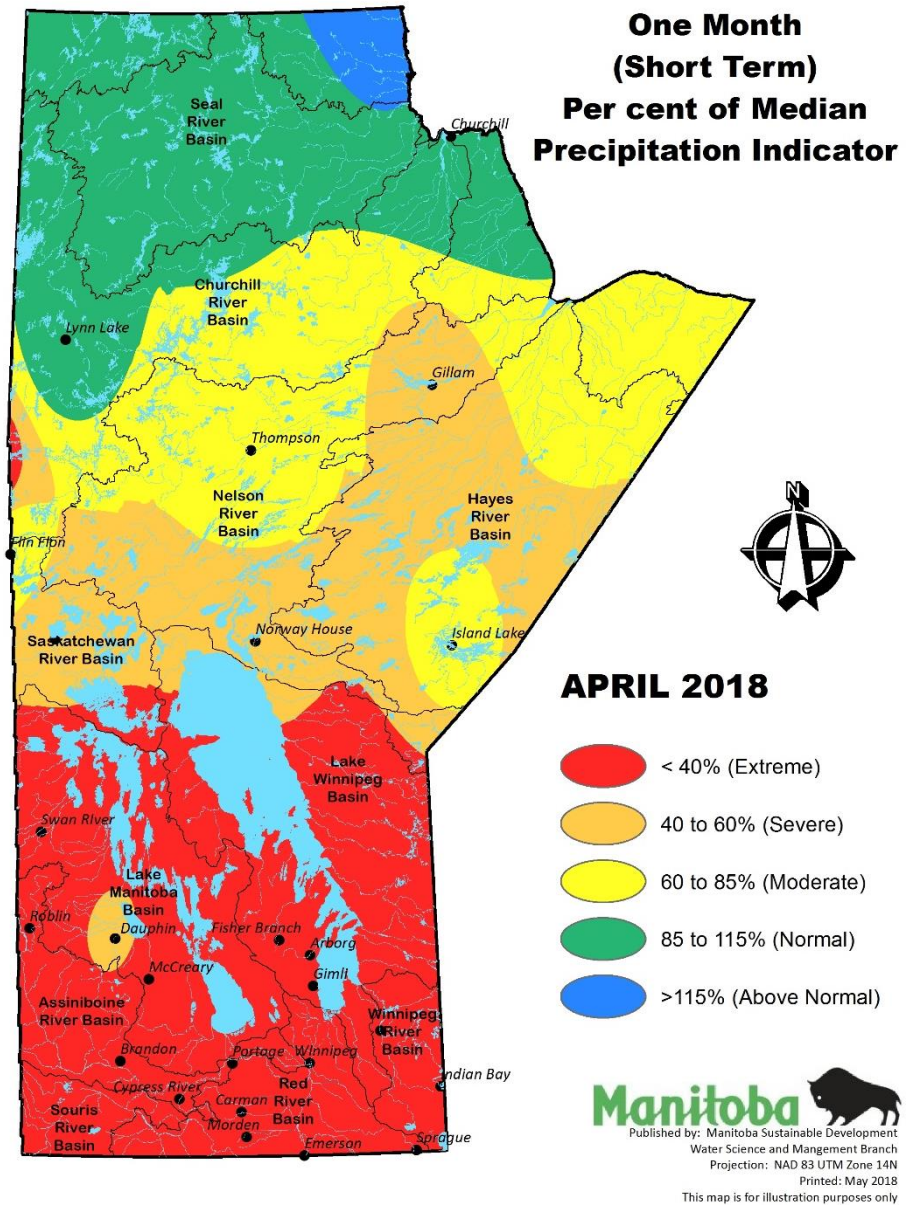


Figure 1: Short term (one month) per cent of median precipitation indicator.

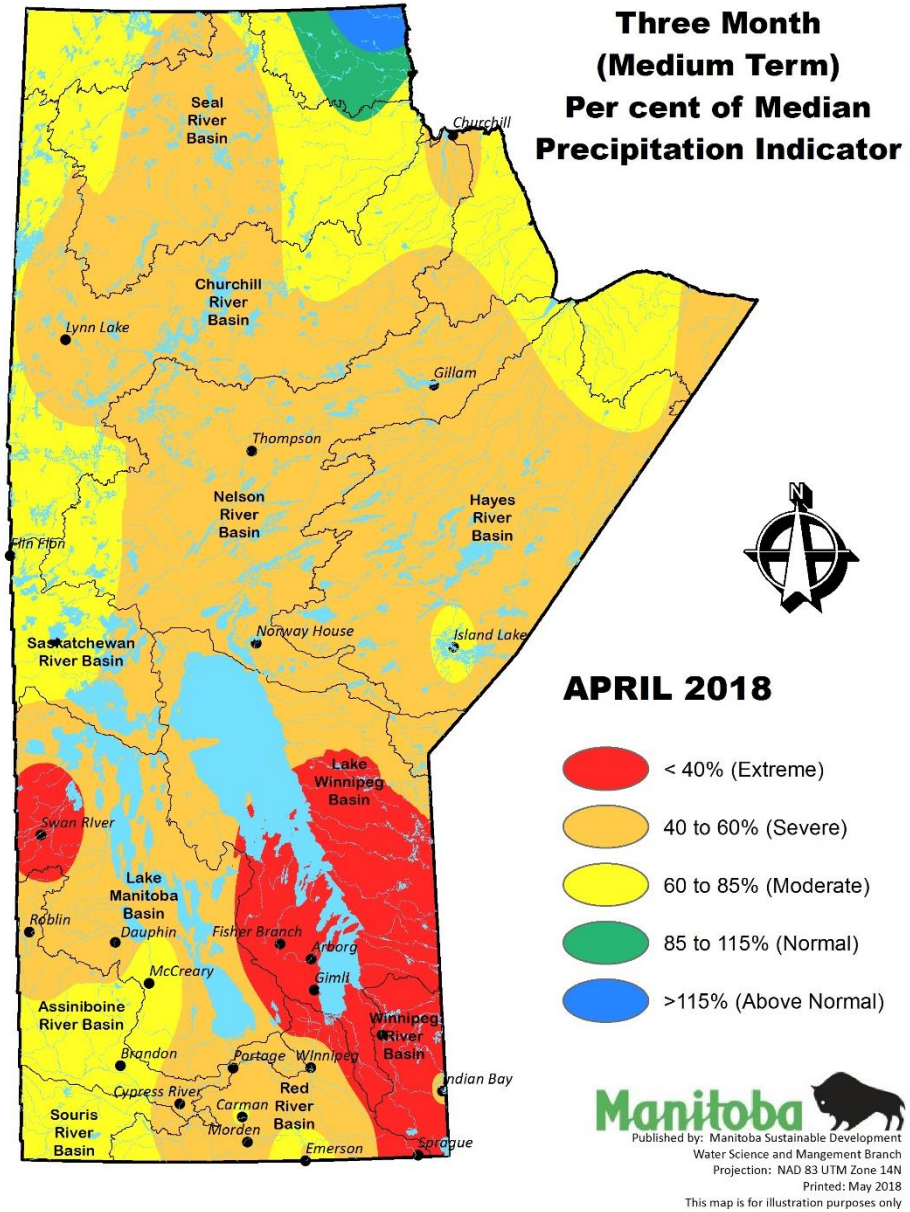


Figure 2: Medium term (three month) per cent of median precipitation indicator.

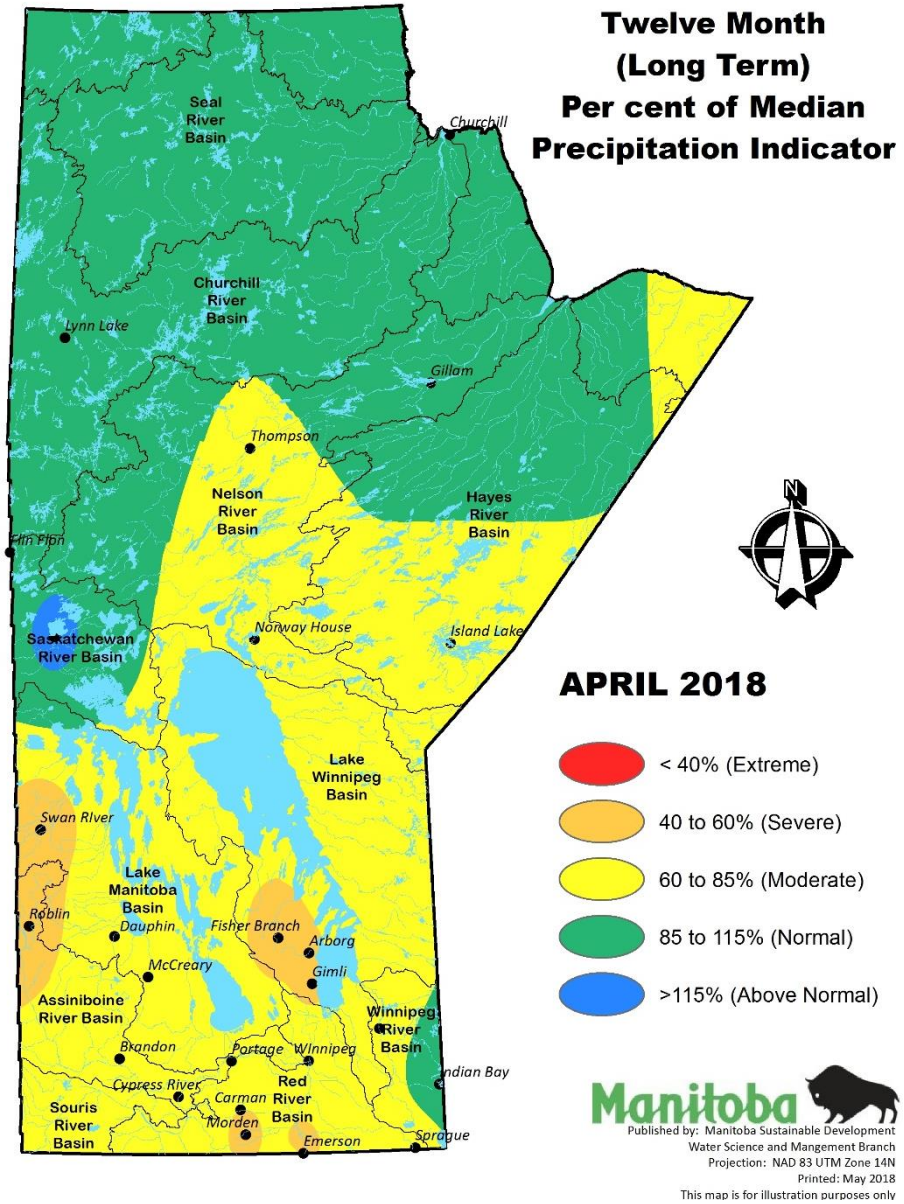


Figure 3: Long term (12 month) per cent of median precipitation indicator.

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 April 29th, 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.

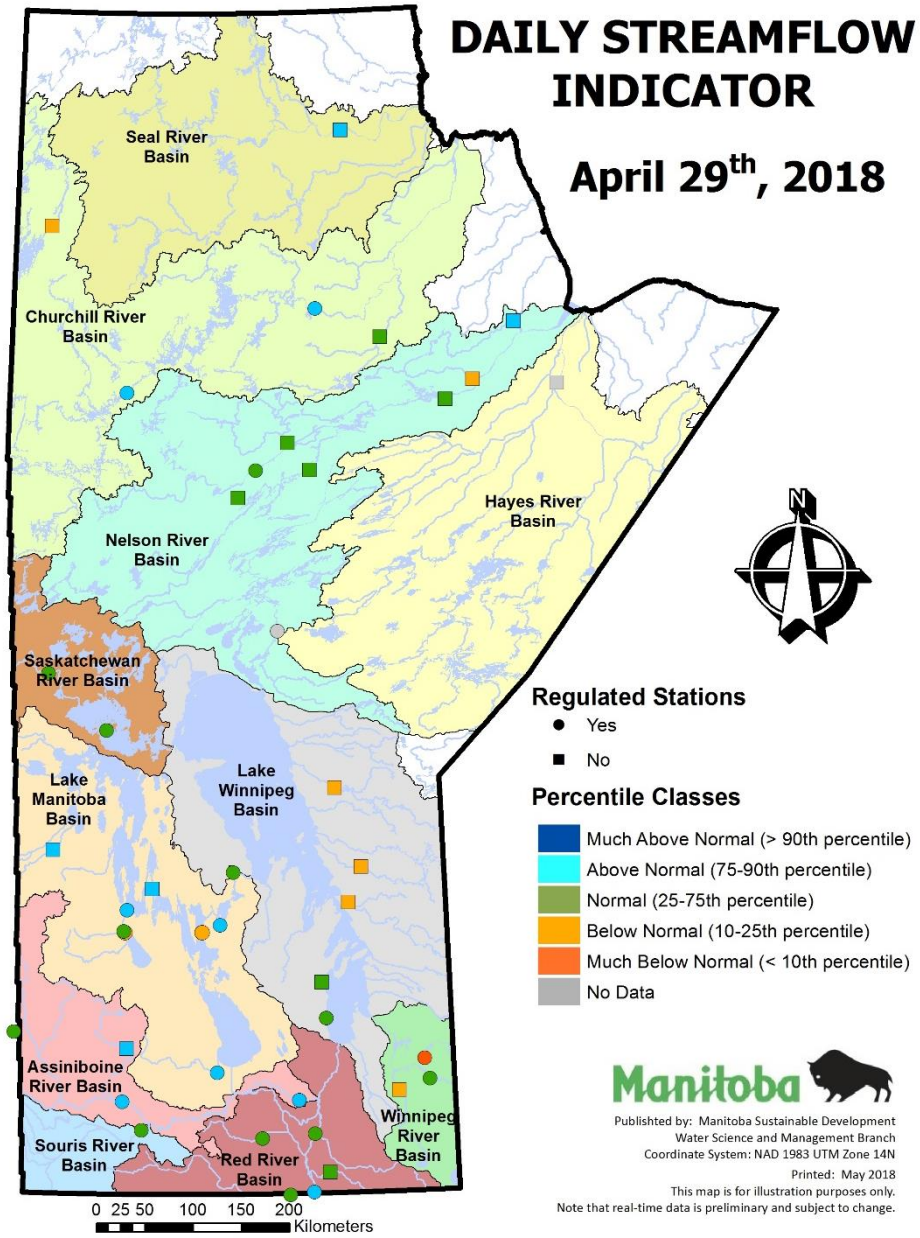


Figure 4: Daily streamflow and lake level indicator for April 29th, 2018.

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).

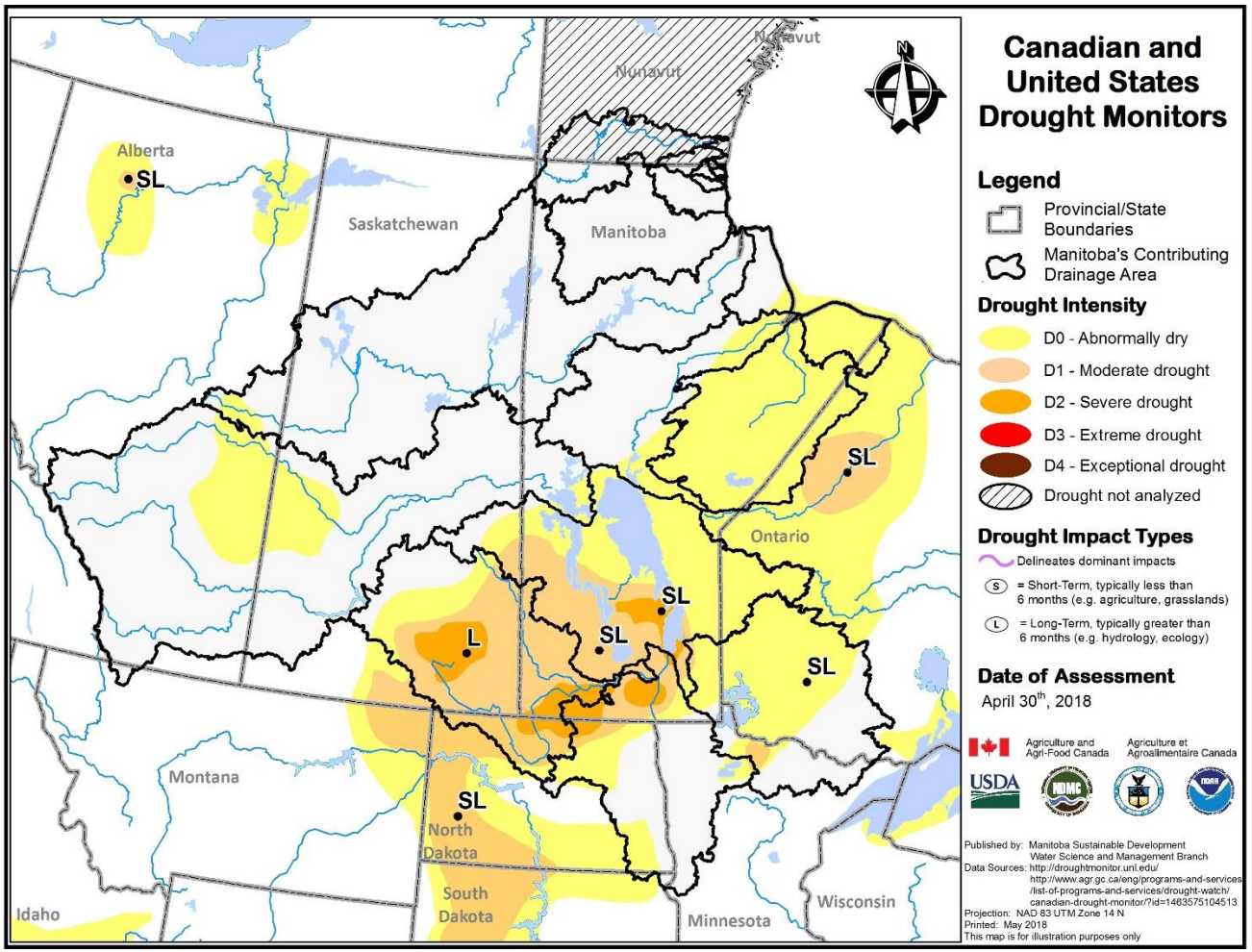


Figure 5: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of April 30th, 2018.

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 – April 30th, 2018.							
Lake or Reservoir	**Community Supplied**	**Target Level (feet)**	**Latest Observed Level (feet)**	**Observed date**	**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, RM of Cartier	1,402.5*	1,395.97	April 30, 2018	300,000	219,665	73%
Lake Wahtopanah (Rivers)	Rivers	1,536*	1,538.13	April 30, 2018	24,500	29,225	119%
Minnewasta (Morden)	Morden	1,082*	1,082.30	April 30, 2018	3,150	3,197	101%
Stephenfield	Carman	972*	972.55	April 30, 2018	3,810	4,067	107%
Vermilion	Dauphin	1,274*	1,275.71	April 30, 2018	2,600	2,999	115%
Goudney (Pilot Mound)		1,482*	1,482.54	April 30, 2018	450	477	106%
Jackson Lake		1,174*	1,170.75	April 30, 2018	2,990	2,193	73%
Manitou (Mary Jane)		1,537*	1,537.14	April 30, 2018	1,150	1,154	100%
Turtlehead (Deloraine)	Deloraine	1,772*	1,772.17	April 30, 2018	1,400	1,418	101%
Kenton Reservoir		1,448	1,447.00	**March 20, 2018**	600	525	88%
Killarney Lake		1,615	1,614.07	**March 14, 2018**	7,360	6,931	94%
Lake Irwin		1,178	1,176.68	**March 15, 2018**	3,800	3,072	81%
Elgin	Elgin	1,532	1,531.20	**September 21, 2017**	520	464	89%
Rapid City		1,573.5	1,573.69	**March 20, 2018**	200	213	107%
St. Malo		840	840.11	**February 22, 2018**	1,770	1,788	101%

[1] Summer target level and storage.
* Real-time water level gauge.

On Farm Water Supply

Farm water supply updates from Manitoba Agriculture's first Crop Report: Issue 1 (May 7th, 2018) are summarized in Table 2.

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

Region	General Dugout Condition
Eastern	75 % full.
Interlake	Information not provided.
Southwest	Low spots and sloughs are diminishing rapidly as frost comes out of the ground. Runoff was minimal.
Central	Adequate, but there was limited spring runoff to refill surface water bodies.
Northwest	Adequate.

Upcoming surveys of irrigation reservoirs and future Manitoba Crop Reports will provide more information on the current condition of on-farm water supplies.

Soil Moisture

Manitoba Agriculture's mapping of topsoil (0 – 30 cm) conditions as of May 6th, 2018 shows most of agro-Manitoba was experiencing adequate to wet topsoil conditions (Figure 6), with some isolated pockets of dry conditions, including a large portion of the southeastern region. Topsoil moisture condition maps are available at:
http://www.gov.mb.ca/agriculture/weather/weather-conditions-and-reports.html.

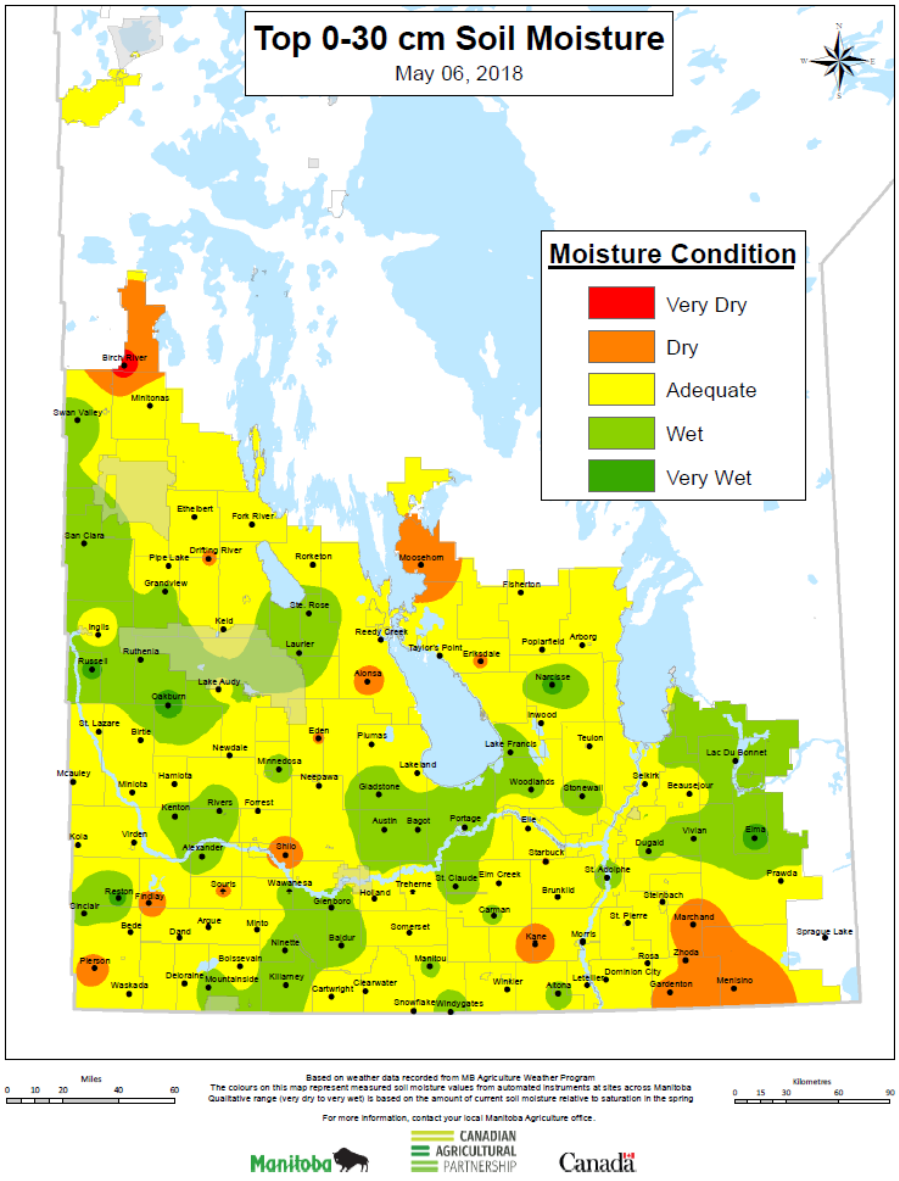


Figure 6: Manitoba Agriculture's May 6th, 2018 mapping of soil moisture conditions in the top 0 – 30 cm.

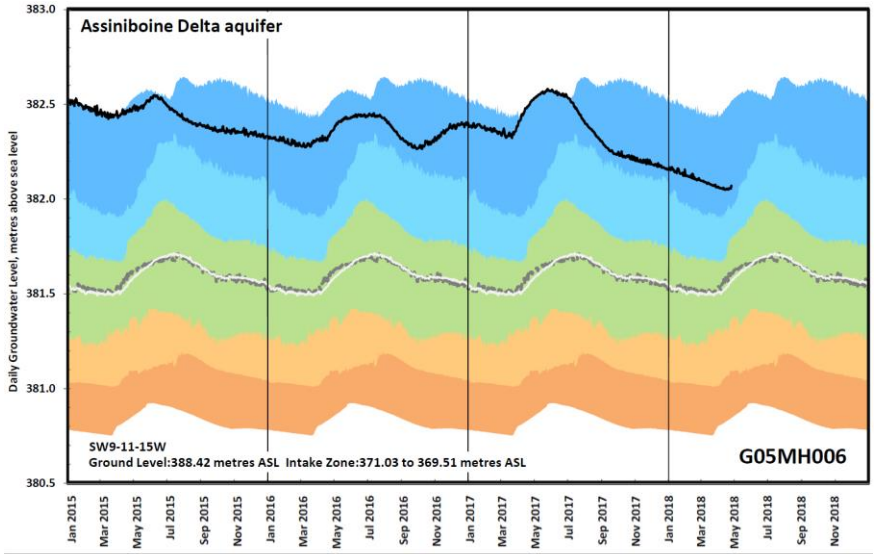
Manitoba
Sustainable Development

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



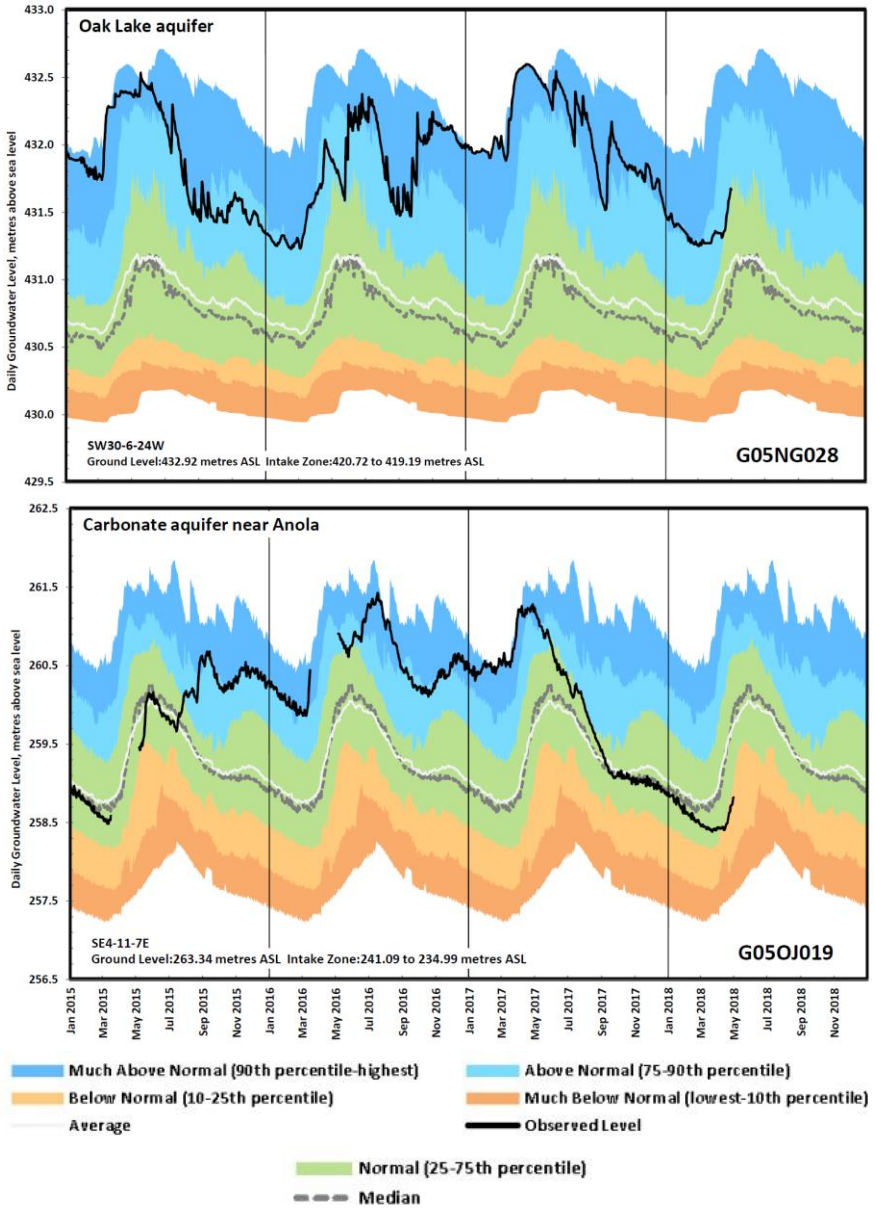


Figure 7: Groundwater hydrographs for the Assiniboine Delta aquifer (top), the Oak Lake aquifer (middle), and the Carbonate aquifer near Anola (bottom).

Wildland Fires

As of May 4th, the Provincial Wildfire Program reported 36 wildfires had occurred, burning a total of 5,645 hectares. Almost all (97 %) occurred in southern Manitoba, primarily in the eastern (5,306 ha) and central (338 ha) and regions. A wildfire Incident Management Team is leading the suppression effort on the Badger wildfire in southeastern Manitoba. The Manitoba Fire Program indicates that good progress is being made on this wildfire.

As of May 7th, 2018, fire danger (Figure 8) remains high to extreme across most of southern Manitoba.

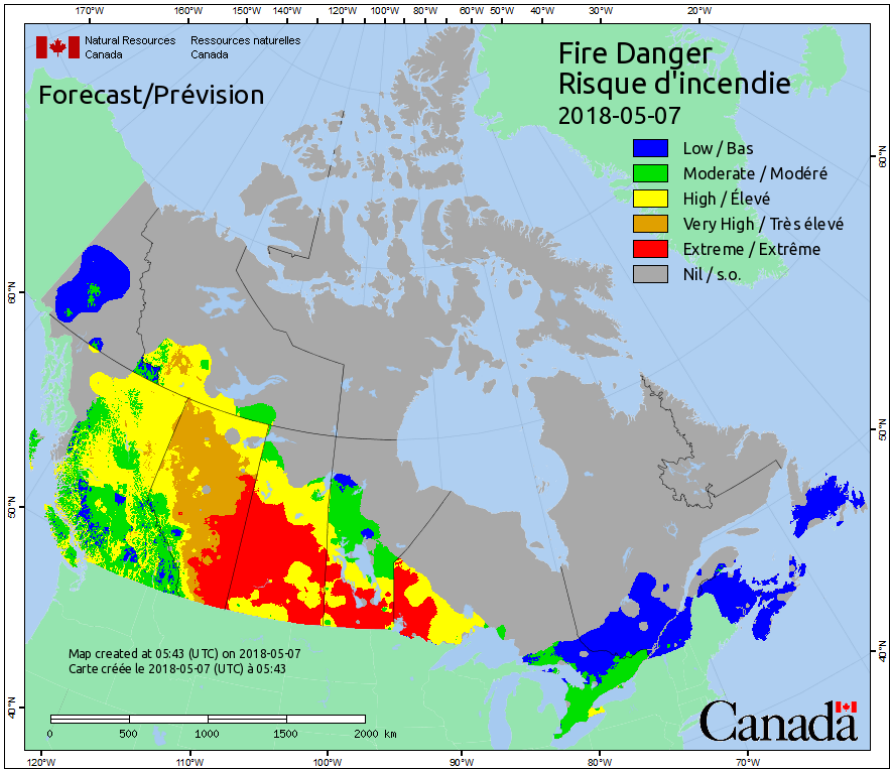


Figure 8: Fire danger mapping by Natural Resources Canada.

Drought Impacts

Wildfires that ignited in late April/early May due to dry and windy conditions have destroyed several houses in the Interlake (RM of Armstrong) and southeastern region of Manitoba (RM of La Broquerie). The RM of Piney enacted a state of emergency on April 30th as the Badger wildfire grew. All burning permits in the eastern areas of central Manitoba are cancelled and some travel restrictions are in place.

Manitoba Agriculture published the first Crop Report of 2018 on May 7th. It is reported that seeding operations are underway in most areas of Manitoba, however soils are becoming dry and rain is needed to aid in crop germination and emergence. Pasture and hay fields are slow to resume growth, however are beginning to green up.

Future Weather

Environment and Climate Change Canada's seasonal forecast for the next three months (May-June-July) projects temperatures to be above normal across Manitoba.

Precipitation over the next three months is forecasted to be below normal in the southwest portion of the province. The reminder of Manitoba is forecasted as normal.

The National Oceanic and Atmospheric Administration indicates that La Niña conditions are currently present, and are expected to transition to ENSO-neutral during April-May. There is a greater than 50 % chance that ENSO-neutral conditions will continue through the Northern Hemisphere during summer 2018.

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

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

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