Water Availability and Drought Conditions Report

MAY 2018

Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for May 2018. Although May rains helped lessen drought conditions, much of Manitoba is experiencing dryness and more precipitation would be beneficial to prevent the severity and extent of drought impacts.
- Precipitation Conditions:
  - During May, precipitation conditions were highly variable. Most regions of agro-Manitoba saw moderate (60 to 85 %) to severe (40 to 60 %) conditions, although normal to above normal conditions were observed in the northwest and eastern regions. Northern Manitoba observed severely to extremely (<40 %) dry conditions, except for the region surrounding Island Lake which was above normal.
  - Over the past three months, most of the province observed moderately to severely dry conditions, with pockets of extremely dry conditions. Regions centered over Roblin and Island Lake were normal (85 – 115 %).
  - Over the past 12 months, most of southern Manitoba 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 and in the northwest agro-region. The remainder of the province, including the southeast corner, observed normal precipitation conditions during this period.
- Most streamflows and lake levels across southern Manitoba were normal or above normal on May 31st, 2018 due to a later than normal spring freshet. However, without additional rainfall, below normal conditions are expected to develop. Below normal conditions were observed within the eastern portion of the Lake Winnipeg Basin, the Winnipeg River Basin, Boyne River, Mossy River, and numerous tributaries in northern Manitoba.
- Groundwater levels in major aquifers are generally good. The Carbonate Aquifer near Anola continued to observe below normal levels during May 2018.
- The Canadian Drought Monitor is expected to release a new assessment on Wednesday, June 6th, 2018 and the information will be uploaded to the Manitoba Drought Monitor website at this time.
- 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 but levels are low and would benefit from significant precipitation. Some dugouts are reported to be empty in the Interlake.
- Dry and windy conditions led to wildfires that impacted a number of communities in central and eastern Manitoba. Impacts included smoke and emergency evacuations along with associated socio-economic and health impacts.
- Environment and Climate Change Canada's seasonal forecast for June-July-August projects temperatures to be above normal for southern Manitoba. Precipitation over the next three months is forecasted 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.

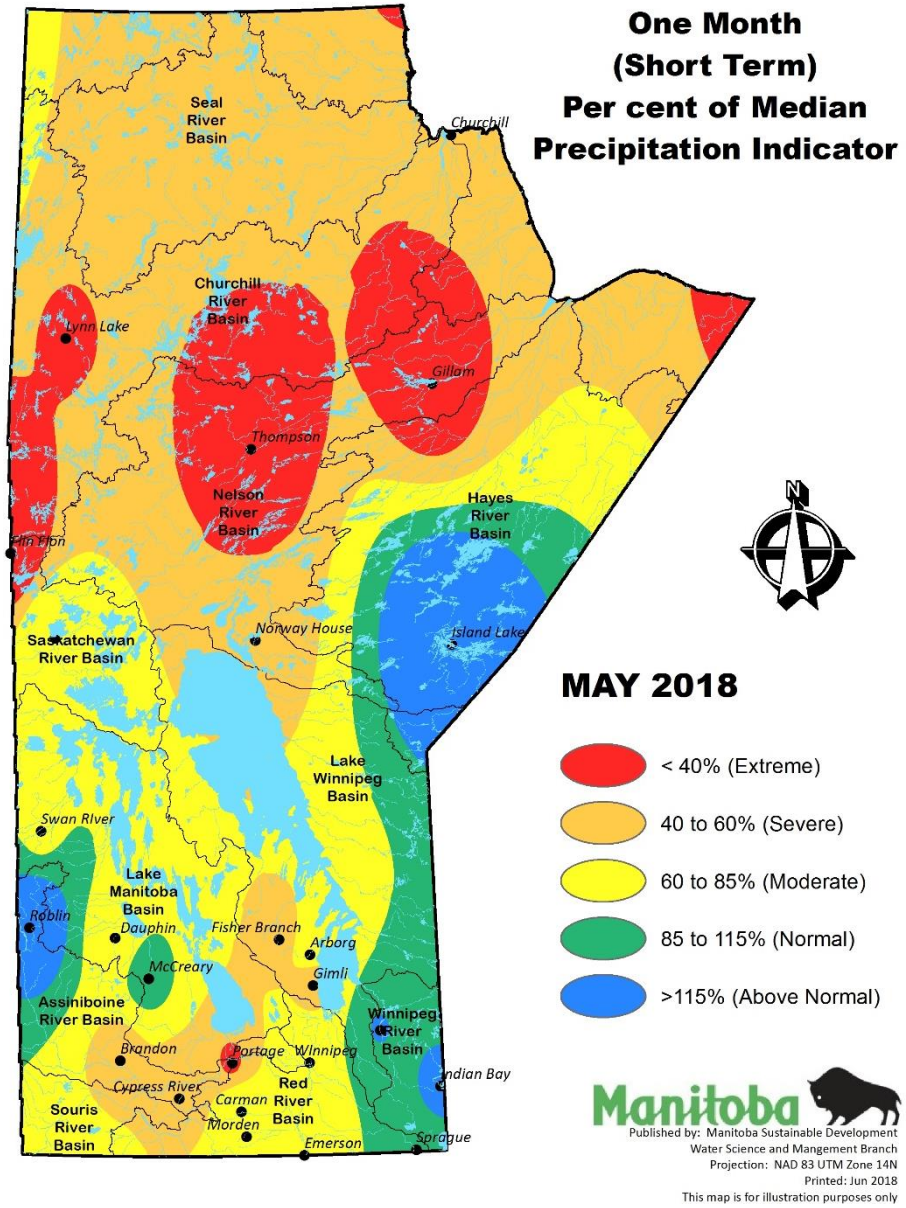


Figure 1: Short term (one month) per cent of median precipitation indicator.

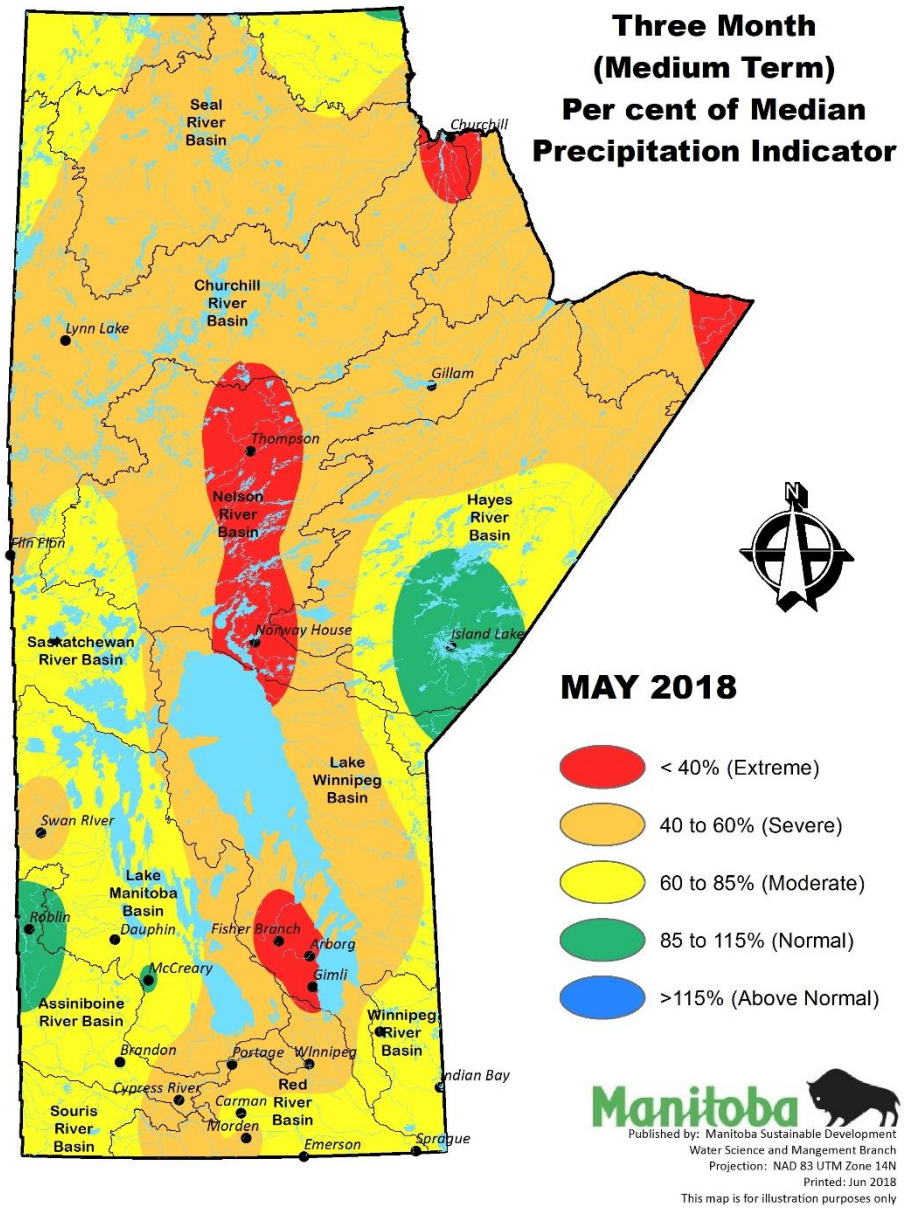


Figure 2: Medium term (three month) per cent of median precipitation indicator.

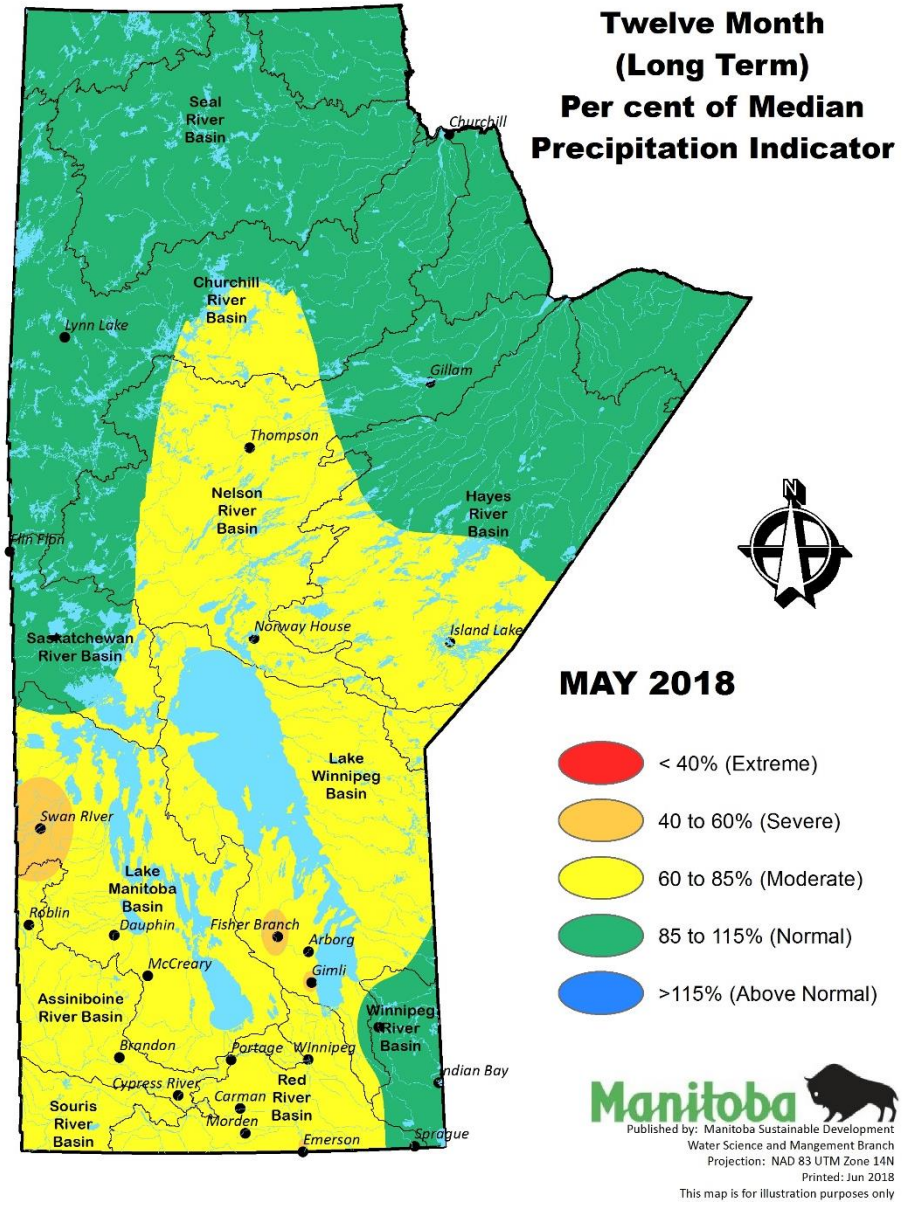


Figure 3: Long term (12 month) per cent of median precipitation indicator.

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 May 31st, 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.

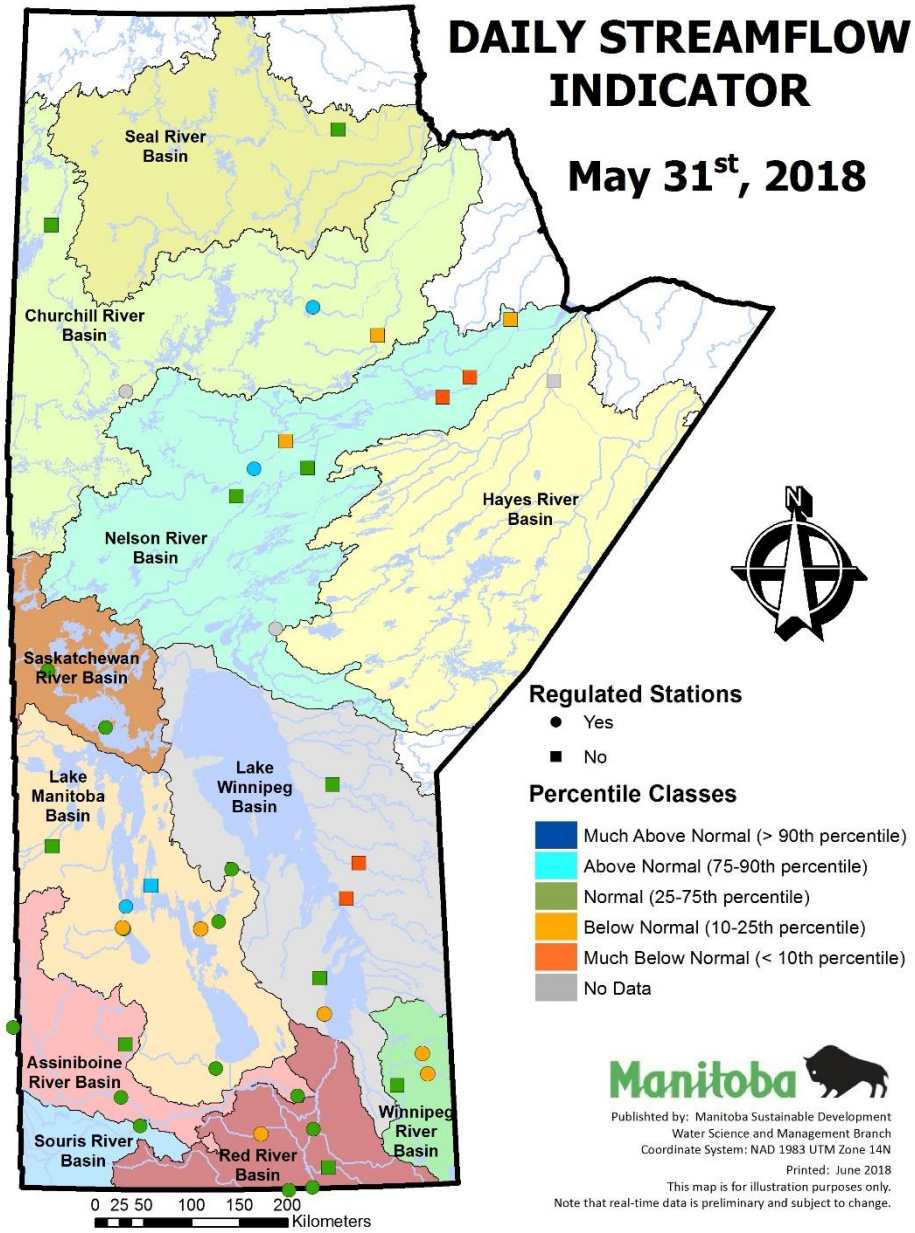


Figure 4: Daily streamflow and lake level indicator for May 31st, 2018.

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 – May 31st, 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	1,402.5*	1,402.31	May 29, 2018	300,000	297,662	99%
Lake Wahtopanah (Rivers)	Rivers	1,536*	1,536.77	May 31, 2018	24,500	26,227	107%
Minnewasta (Morden)	Morden	1,082*	1,081.48	May 31, 2018	3,150	3,062	97%
Stephenfield	Carman	972*	972.35	May 31, 2018	3,810	3,974	104%
Vermilion	Dauphin	1,274*	1,275.34	May 31, 2018	2,600	2,914	112%
Goudney (Pilot Mound)		1,482*	1,482.20	May 31, 2018	450	460	102%
Jackson Lake		1,174*	1,171.56	May 31, 2018	2,990	2,386	80%
Manitou (Mary Jane)		1,537*	1,537.05	May 31, 2018	1,150	1,151	100%
Turtlehead (Deloraine)	Deloraine	1,772*	1,771.90	May 31, 2018	1,400	1,395	100%
Kenton Reservoir		1,448	1,448.02	May 10, 2018	600	601	100%
Killarney Lake		1,615	1,615.20	May 8, 2018	7,360	7,452	101%
Lake Irwin		1,178	1,178.03	May 15, 2018	3,800	3,820	101%
Elgin	Elgin	1,532	1,532.05	May 11, 2018	520	523	101%
Rapid City		1,573.5	1,574.37	May 10, 2018	200	261	130%
St. Malo		840	840.59	May 24, 2018	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 4 (May 28th, 2018) are summarized in Table 2. If conditions were not described in Issue 4, 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	75 % full.
Interlake	Although drinking water is currently adequate for most cattle operations, dugout water levels are declining and range from 1/3 to 2/3 full, with some reported to have no water.
Southwest	Dugouts, sloughs and creeks are low in most areas, though there is some variability depending on the area (May 22nd Crop Report)
Central	Adequate at this time but water levels are low and would benefit from significant precipitation. Where possible some producers have been pumping water into their dugouts to improve supplies.
Northwest	Adequate (May 7th Crop Report)

Soil Moisture

Manitoba Agriculture's mapping of topsoil (0 – 30 cm) conditions as of May 27th, 2018 shows most of agro-Manitoba was experiencing adequate to dry topsoil conditions with some isolated pockets of wet conditions (Figure 5).

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

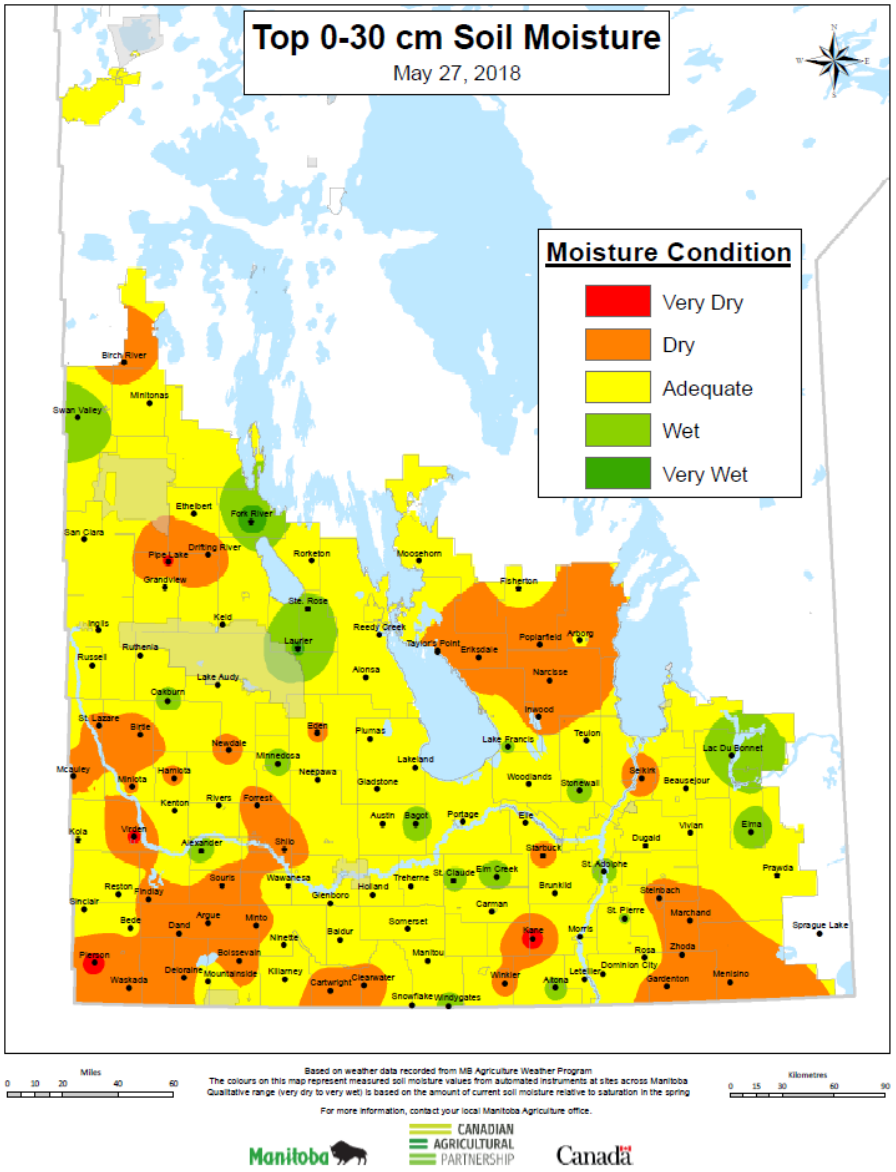


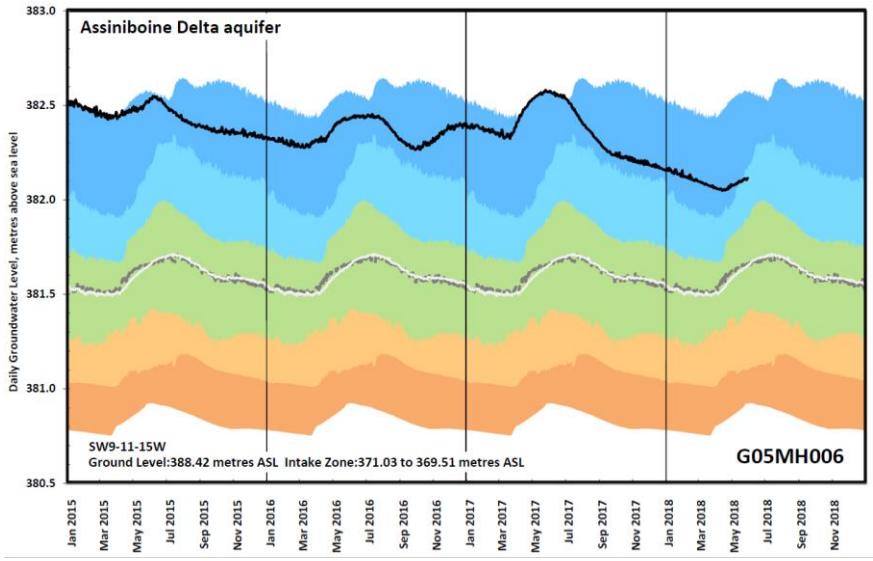
Figure 5: Manitoba Agriculture's May 27th, 2018 mapping of soil moisture conditions in the top 0 – 30 cm.

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 May 2018 for the Assiniboine Delta aquifer, the Oak Lake aquifer, and the Carbonate aquifer near Anola are provided on Figure 6.



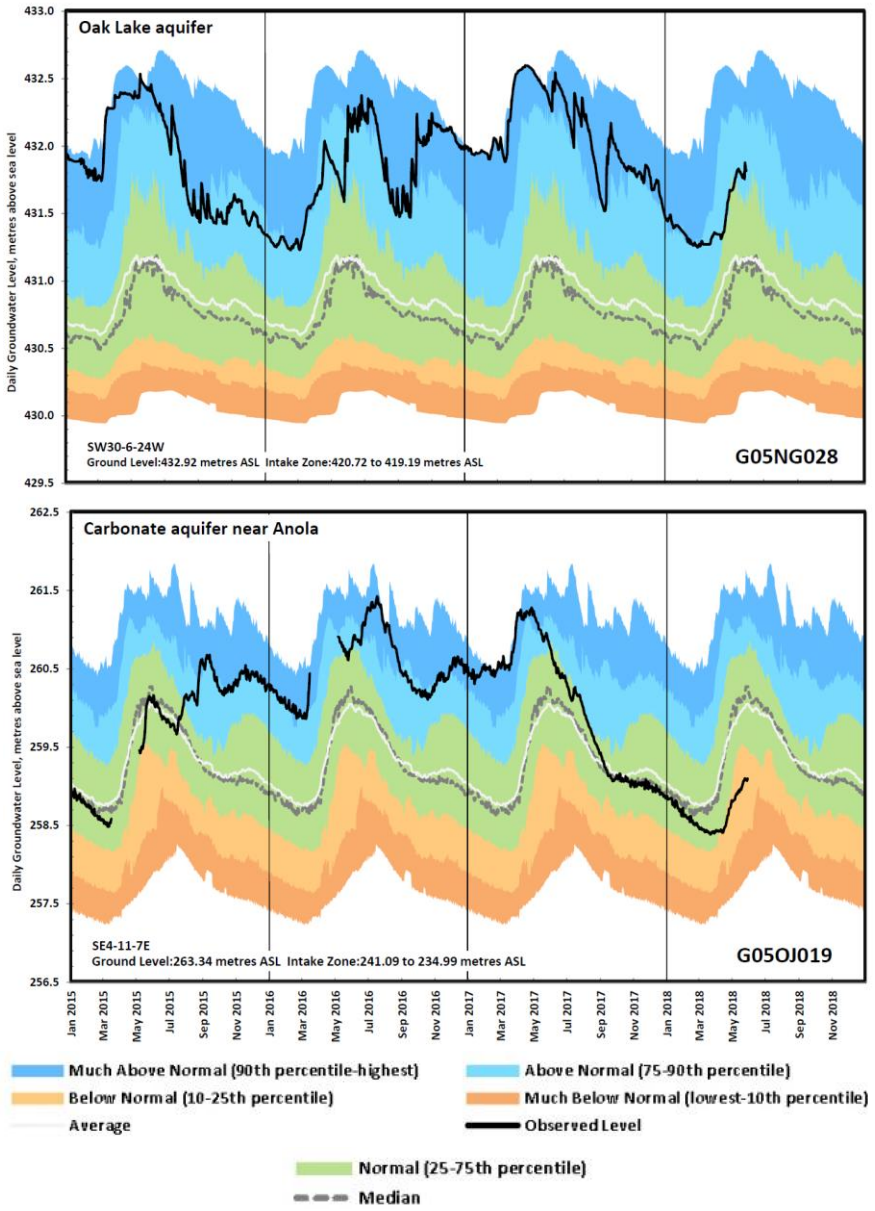


Figure 6: Groundwater hydrographs for the Assiniboine Delta aquifer (top), the Oak Lake aquifer (middle), and the Carbonate aquifer near Anola (bottom).

Wildland Fires

As of May 31st, 2018, the Provincial Wildfire Program reported 206 wildfires had occurred, while the average for this date is 119. A total of 71,824 hectares have been burned, almost all of which occurred in southern Manitoba, primarily in the eastern (33,336 ha) and central (28,495 ha) regions. The majority of fires continue to be human caused near communities and urban interface areas. Suppression activities continue on large fires.

As of May 31st, 2018, fire danger (Figure 7) is low to moderate across Manitoba due to recent rainfall, which has helped to assist suppression efforts.

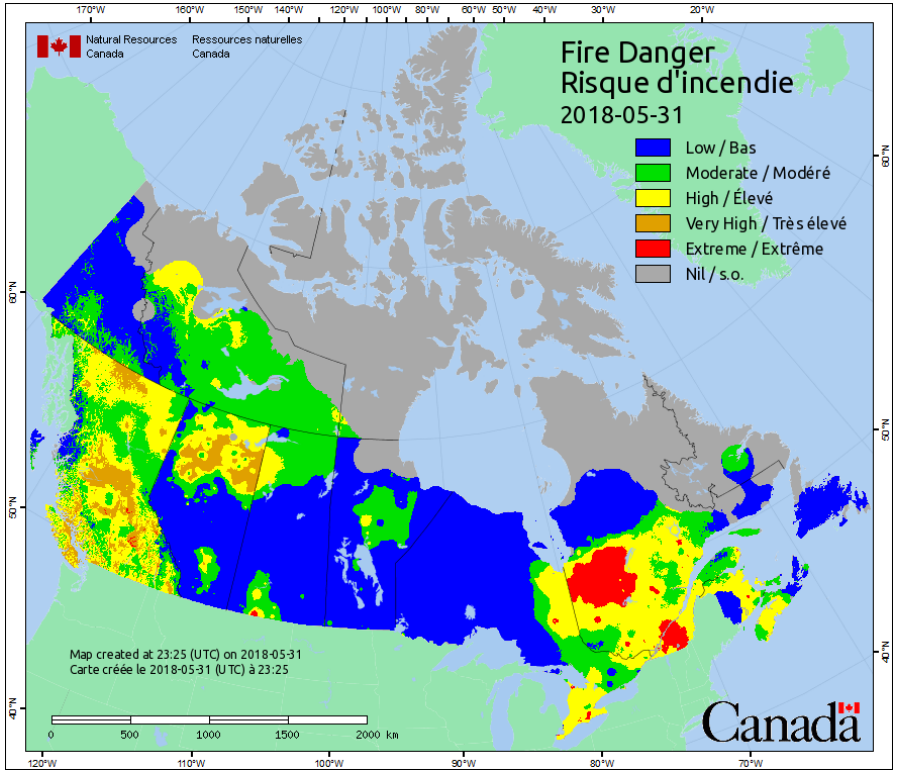


Figure 7: Fire danger mapping by Natural Resources Canada.

Drought Impacts

Wildfires exhibiting extreme fire behaviour with dry and windy conditions impacted a number of communities due to the proximity of fires and related smoke. Communities evacuated during May due to wildfires include: Little Grand Rapids First Nation, Pauingassi First Nation, Sapotaweyak Cree Nation, and Pelican Rapids. Other impacted regions include the RMs of Grahamdale and West Interlake (community of Ashern).

Manitoba Agriculture published Crop Report: Issue 4 on May 28th, 2018. It is reported that seeding is estimated at 94 % complete, and the recent rains and warm temperatures have resulted in rapid germination, emergence, and crop growth. Although most areas of agro-Manitoba received rainfall, amounts were variable. Additional precipitation is needed in many areas.

Several regions reported patchy crop emergence in some areas due to the dryer seedbed conditions; particularly the fields with pre-seed tillage. Hay and pasture have been slow to grow and are generally rated as fair to poor due to dry conditions, but have improved in areas that received adequate precipitation. Forage growth remains a concern in regions where rainfall has been minimal, and there are reports that greenfeed is being planted to help compensate for poor hay yields if dry conditions continue. Livestock continue to be hauled to pasture and supplementation is required where moisture has been lacking. In the southwest region, some producers have been looking for hay or other alternative supplements.

Future Weather

Environment and Climate Change Canada's seasonal forecast for the next three months (June-July-August) projects temperatures to be above normal across the lower two thirds of Manitoba and normal to below normal for the remainder of the province. Precipitation over the next three months is forecasted to be normal across Manitoba.

The National Oceanic and Atmospheric Administration indicates that ENSO-neutral conditions are current present and are favoured through to September - November 2018. There is approximately a 50 % chance that El Niño conditions will develop through the Northern Hemisphere by 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