

Water Availability and Drought Conditions Report

JULY 2021

Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for July 2021. Conditions remain extremely dry across southern Manitoba with varied impacts occurring, primarily to the agricultural sector, but extending to other sectors as well.
- For more information on conditions, indicators, and resources for those impacted by drought conditions, please visit the Manitoba Drought Monitor at www.manitoba.ca/drought
- Precipitation conditions over the past month, three month, and twelve month periods are as follows:
 - During July, agri-Manitoba experienced severely (40 – 60 % of median) to extremely (<40 %) dry precipitation conditions. In northern Manitoba, conditions were generally moderately (60 – 85 %) to extremely dry.
 - Over the past three months (May, June, July), most of agri-Manitoba experienced moderately to severely dry conditions with some pockets of extremely dry conditions in the Interlake and eastern regions. Conditions in northern Manitoba were normal (85 – 115 %) to moderately dry.
 - Over the past 12 months, most of agri-Manitoba experienced moderately to severely dry conditions with some pockets of extremely dry conditions in the Interlake and central regions. Conditions in northern Manitoba were normal to moderately dry.
- As of July 29, 2021, most rivers and lakes across southern Manitoba were showing below normal (10th – 25th percentile) to much below normal (< 10th percentile) conditions, with some showing record low flows or levels.
- Groundwater levels have decreased slightly at all indicator sites but there are no changes in category rating from last month with some water levels remaining in above normal and normal range and others much below normal. Record low water levels for July are being recorded at indicator wells near Steinbach, Anola and Poplarfield. Even with the low water levels most aquifers still contain large amounts of water. However, local conditions may vary and shallow aquifers of limited extent may experience water levels declining below the pump and reported as dry or intermittently dry during pumping cycles. There are also reports in some areas, especially the Interlake, that previously flowing wells now have water levels below ground. Small shallow aquifers of limited extent and water storage capabilities may not be able to meet current water requirements. Demand for new well drilling is high; a listing of currently licensed water well drillers is available at: https://www.gov.mb.ca/water/groundwater/wells_groundwater/index.html.
- The July 31, 2021 Canadian Drought Monitor assessment showed that conditions continued to degrade over the month of July, with almost all of agri-Manitoba classified as D3 (extreme drought) or D4 (exceptional drought) conditions. Drought conditions extended northward, giving way to abnormally dry (D0) conditions near Thompson.
- Most provincial water supply reservoirs are above 80 % full supply level, except for Lake Minnewasta, Stephenfield Reservoir and Jackson Lake. Provincial water control structures are being operated to mitigate low water level conditions and balance the impacts on multiple stakeholders. Some municipalities have implemented water conservation restrictions (either voluntary or mandatory) including the City of Morden and Pembina Valley Water Co-op and its member municipalities.

- Overall reservoir storage and flows in the basins supplying Manitoba Hydro generation are well below average for this time of year. Manitoba Hydro is planning its reservoir operations to ensure energy demands can be met, assuming drought conditions continue.
- Other impacts that may be connected to lowered water levels and high temperatures include reports of fish kills and algal blooms in water bodies across southern Manitoba.
- On-farm water supplies continue to deteriorate and there have been continued reports of well drilling and hauling water to supplement on-farm water supplies. Livestock producers can apply for funding to support water source development under [Ag Action Manitoba](#).
- There is currently a severe shortage of forage throughout the province. More cereal crops are being cut for greenfeed (farmers must [contact MASC](#) prior to putting crops to alternate use). The [Manitoba Hay Listing Service](#) is active; producers with extra feed or looking for feed are encouraged to list their available supplies for sale.
- Yield outlook for most crops has been downgraded this week and grasshopper feeding has become more widespread. Twenty-one rural municipalities and several Northern Affairs communities have declared States of Agricultural Disaster due to persistent growing challenges including insects and lack of rainfall. The [Manitoba Farm, Rural & Northern Support Services](#) hotline is available 24/7 for farmers and ranchers dealing with crises and stressful situations at 1-866-367-3276.
- As of August 3, 2021, wildfire danger was moderate to extreme in the south and moderate to high in the north. Conservation and Climate's Wildfire Program reported 422 wildfires this year to date, burning a total area of 936,403 hectares. Over the past month, wildfires have resulted in evacuations of several communities and First Nations, [fire and travel restrictions](#), and degraded air quality across the province.

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.

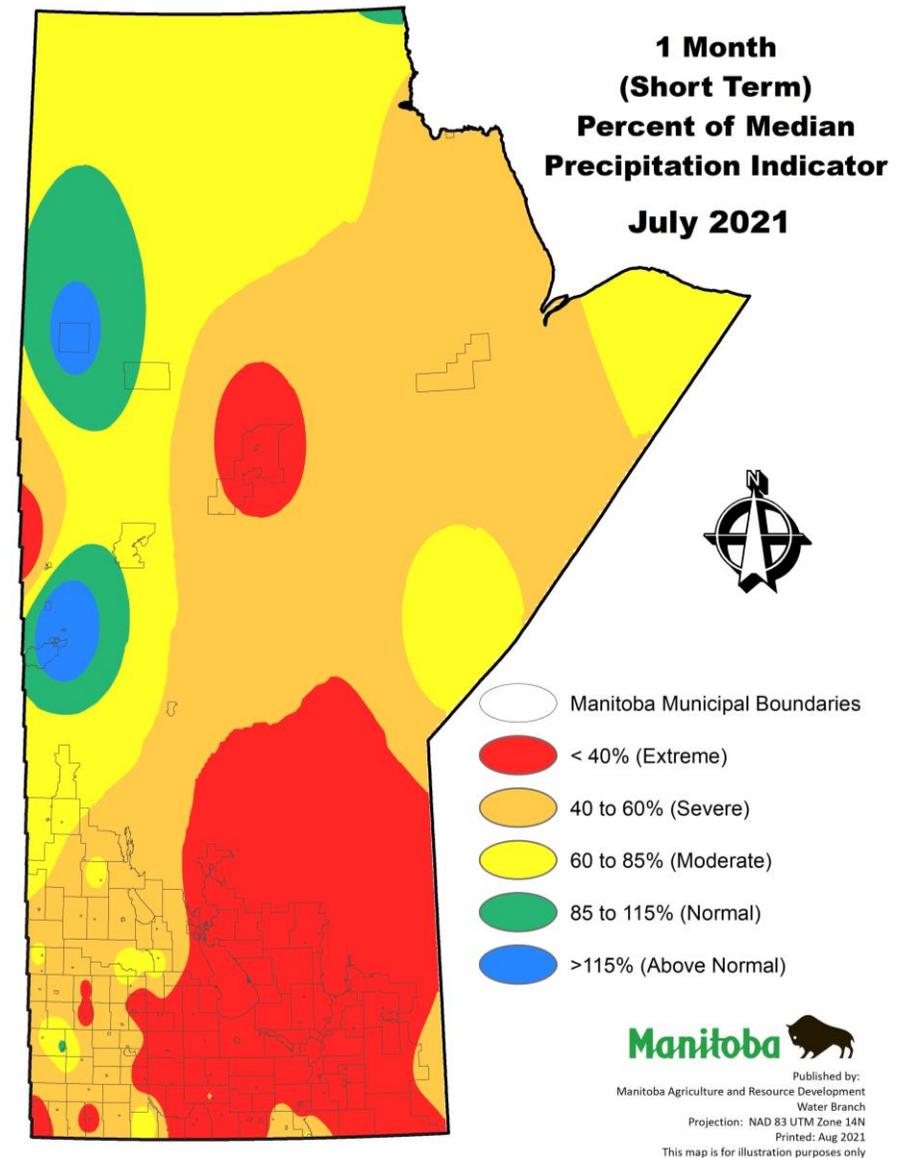


Figure 1: One month (short term) per cent of median precipitation indicator.

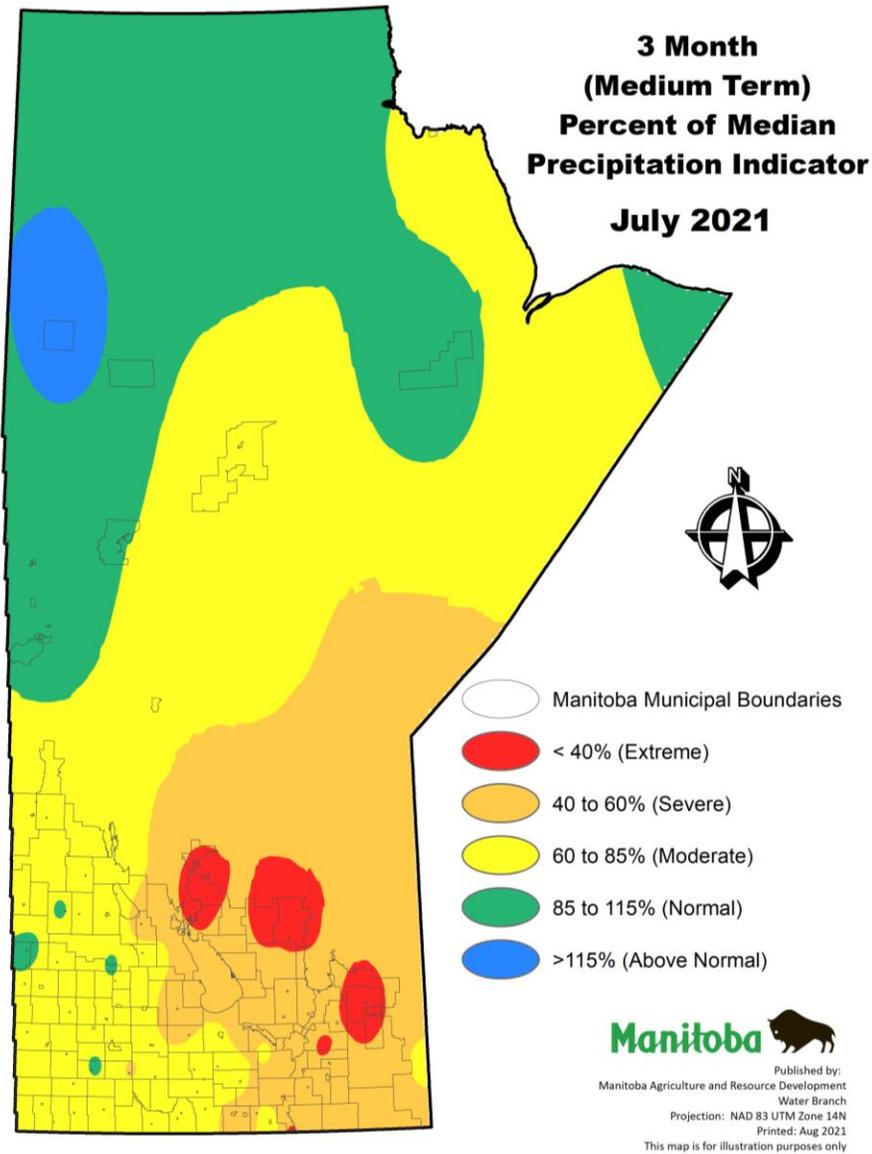


Figure 2: Three month (medium term) per cent of median precipitation indicator.

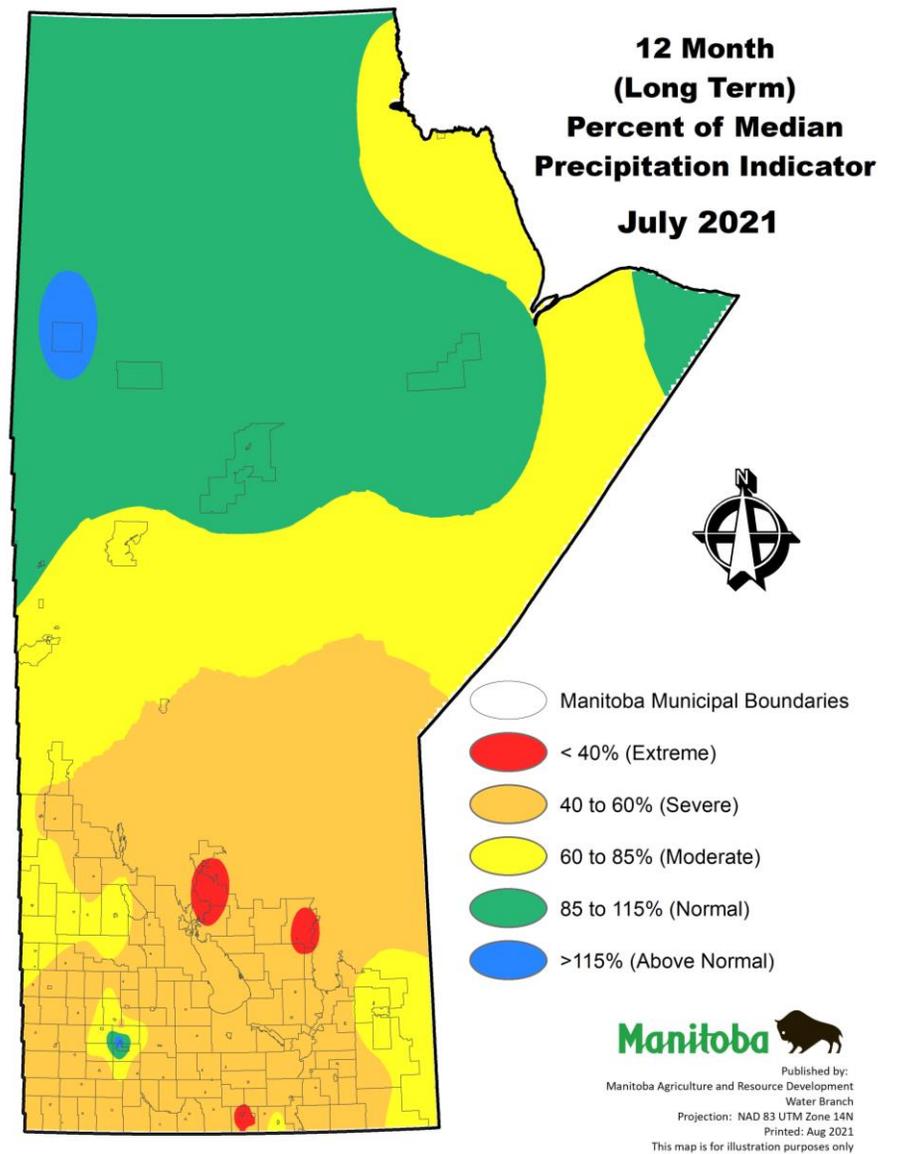


Figure 3: Twelve month (long term) per cent of median precipitation indicator.

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 July 29, 2021.

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 Indicator Map* tab.

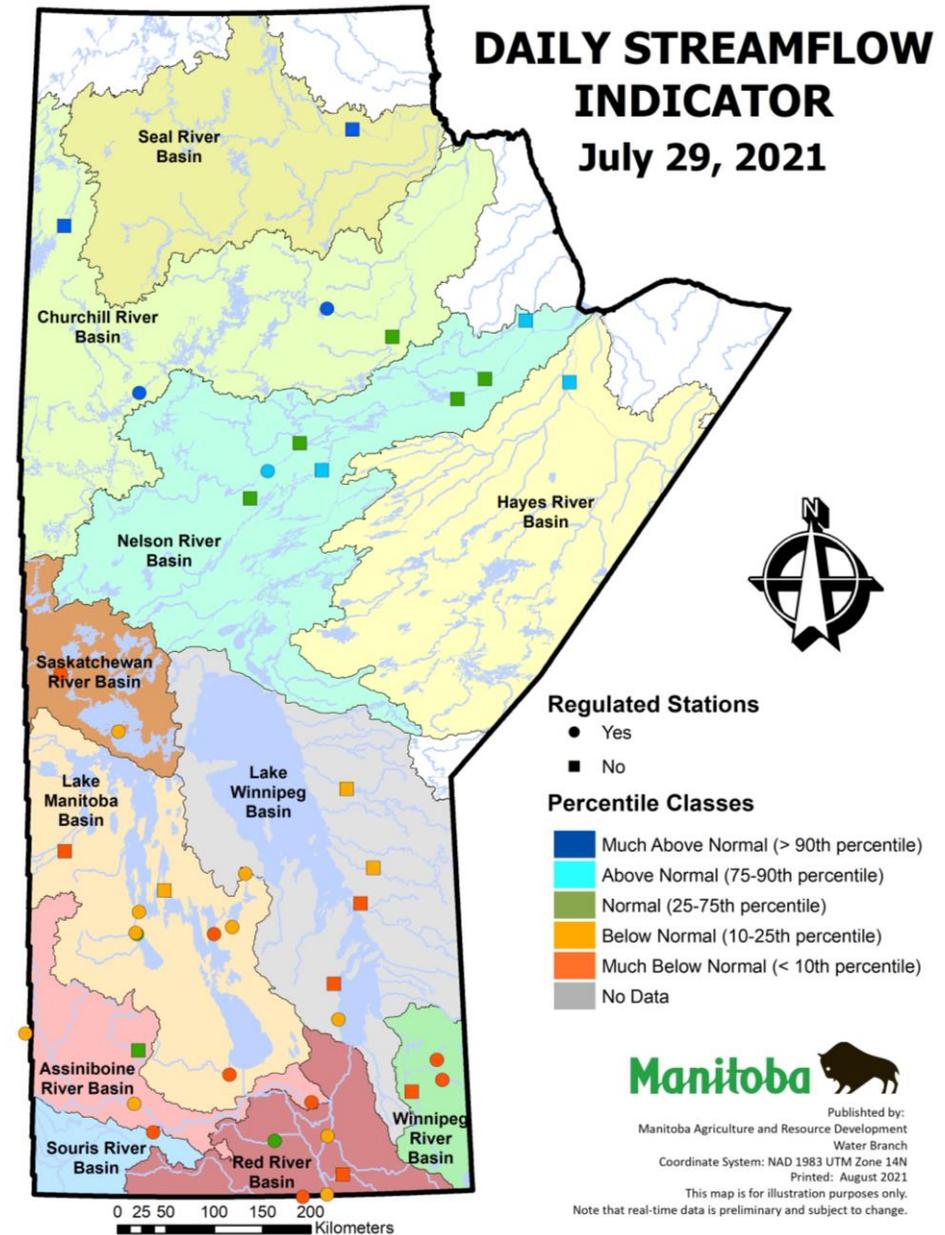


Figure 4: Daily streamflow and lake level indicator for July 29, 2021.

Groundwater Indicator

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. As the water table drops, there is less available drawdown in shallow wells and some wells may 'go dry'.

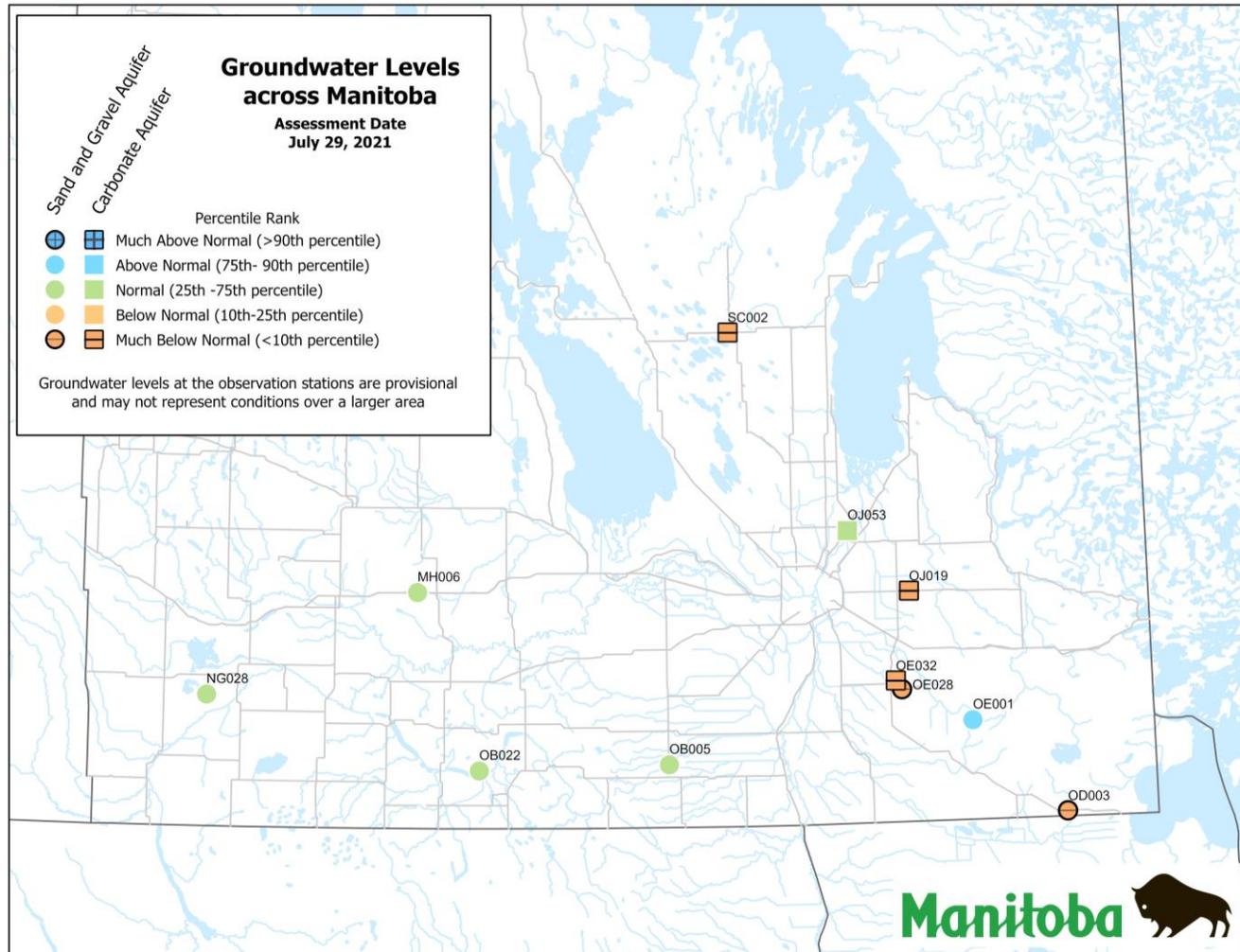


Figure 5: Groundwater indicator on July 29, 2021 for select groundwater monitoring sites.

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 6).

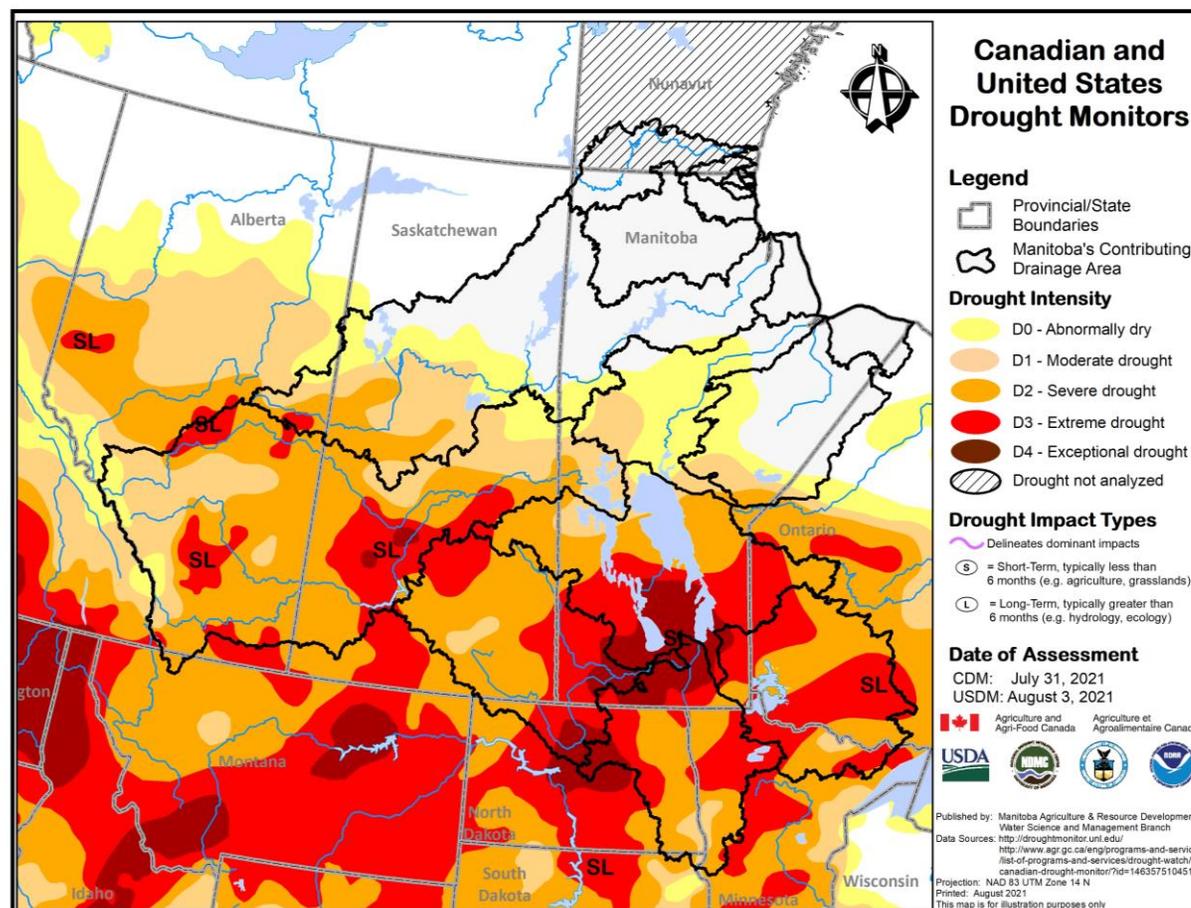


Figure 6: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of July 31, 2021.

Water Availability

Reservoir Conditions

Table 1: Water Supply Reservoir Levels and Storages – July 29, 2021 (Southern and Western Manitoba).

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	1402.13	July 27, 2021	-0.37	300,000	295,425	98%
Lake Wahtopanah (Rivers)*	Rivers	1,536	1536.08	July 29, 2021	0.08	24,500	24,683	101%
Minnewasta (Morden)*	Morden	1,082	No data currently available – gauge issue					
Stephenfield*	Carman, Pembina Valley Water Co-op	972	969.70	July 29, 2021	-2.30	3,810	2,808	74%
Vermilion*	Dauphin	1,274	1274.30	July 29, 2021	0.30	2,600	2,670	103%
Goudney (Pilot Mound)*		1,482	No data currently available – gauge issue					
Jackson Lake*		1,174	1170.15	July 29, 2021	-3.85	2,990	2,057	69%
Manitou (Mary Jane)*		1,537	1537.53	July 29, 2021	0.53	1,150	1,166	101%
Turtlehead (Deloraine)*	Deloraine	1,772	1768.74	July 29, 2021	-3.26	1,400	1,167	83%
Lake Irwin*		1,178	1176.87	July 29, 2021	-1.13	3,800	3,148	83%
Minnedosa*		1,682	1682.68	July 28, 2021	0.68	1,688	1,872	111%
Boissevain*	Boissevain	1,697	1695.61	July 29, 2021	-1.39	505	407	81%
Kenton Reservoir		1,448	1446.88	July 28, 2021	-1.12	600	522	87%
Killarney Lake		1,615	1613.69	May 12, 2021	-1.31	7,360	6,756	92%
Elgin		1,532	1531.76	May 12, 2021	-0.24	520	503	97%
St. Malo		840	840.30	May 13, 2021	0.30	1,770	1,819	103%

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

On Farm Water Supply

Farm water supply updates from Manitoba Agriculture and Resource Development's Crop Report Issue 15 (published August 3, 2021) are provided in Table 2.

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

Region	General Dugout Condition
Eastern	Dugouts are dry, but most livestock watering relies on other sources in the Eastern region. Livestock water availability is rated as adequate.
Interlake	New water wells being drilled and dugouts being deepened due to lack of drinking water for livestock.
Southwest	Dugouts are 10% full, some are being dug deeper. Sloughs are dry again for the most part; creeks are not flowing except the Souris River.
Central	No recent conditions update available.
Northwest	Water availability for livestock on pasture continues to deteriorate and remains a concern.

Soil Moisture

A regional representation of soil moisture conditions for the top 30 cm relative to the field capacity is shown for August 8, 2021.

The style of soil moisture map reporting has been recently updated to more accurately reflect the extreme drought conditions. Soil moisture mapping is now displayed as relative to Field Capacity rather than Saturation. Mapping based on Field Capacity better depicts the differences in water availability based on soil texture under dry conditions.

Soil moisture maps are created by classifying current values that are less than 25 % of available water as Very Dry, between 25 % - 50 % as Dry, 50 % to field capacity as Optimal, field capacity to 75 % of saturation minus field capacity as Wet, and above this level as Very Wet.

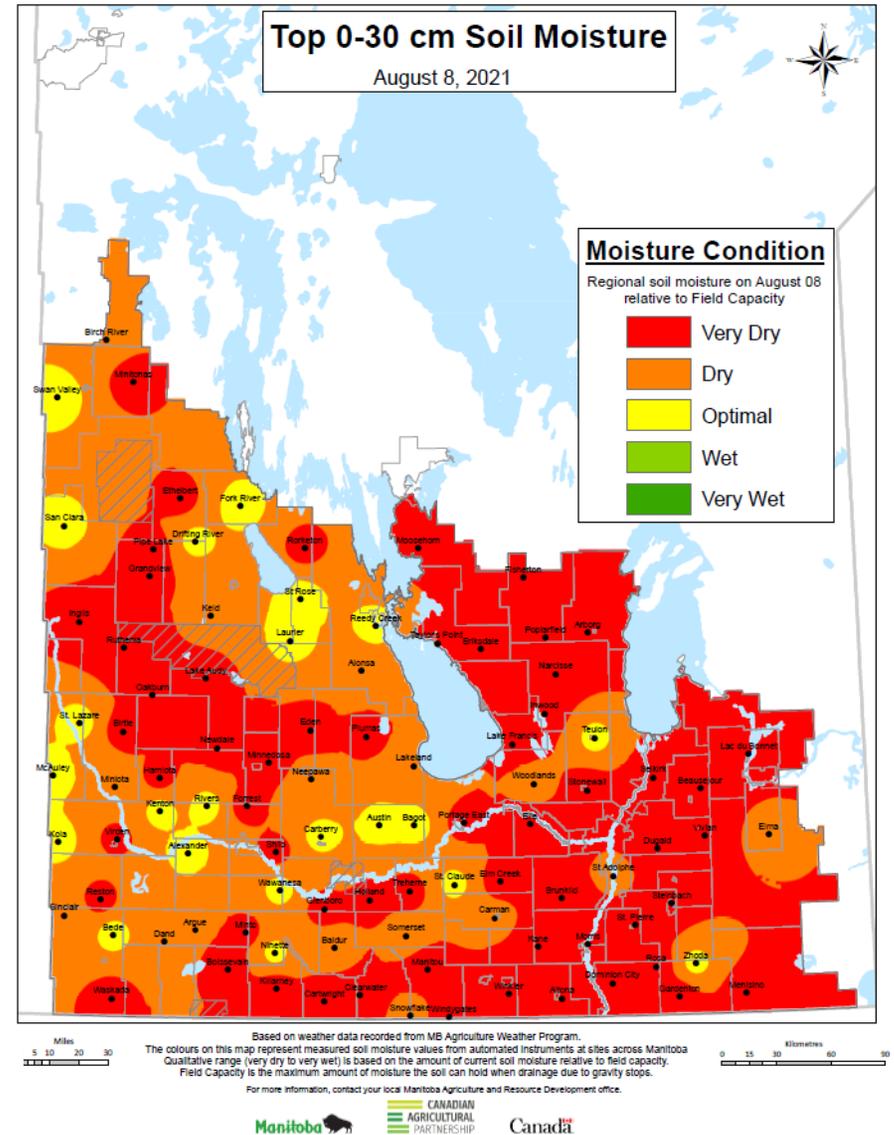


Figure 7: Manitoba Agriculture and Resource Development's August 8, 2021 mapping of soil moisture conditions in the top 0 – 30 cm.

Wildland Fires

As of August 3, 2021 Conservation and Climate's Wildfire Program reported 422 wildfires this year to date, burning a total area of 936,403 hectares. Most of the burned area occurred in the eastern region. The fire danger across southeastern and central regions of Manitoba was rated as high to extreme, while danger levels in the north were moderate to high.

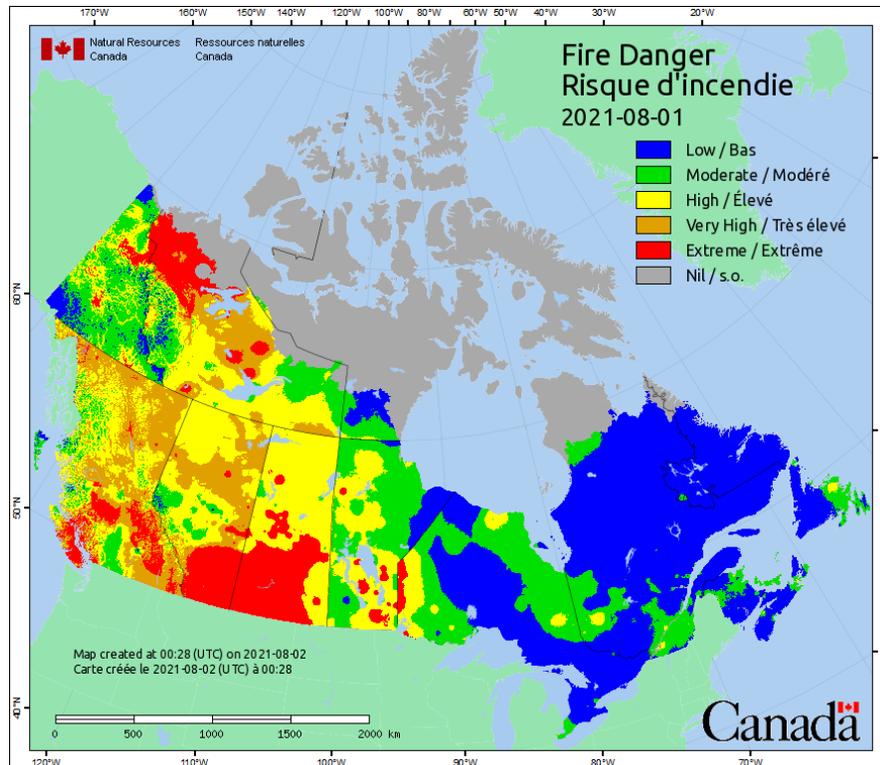


Figure 8: Fire Danger mapping by Natural Resources Canada.

Drought Impacts

Wildland Fires

Over the past month, wildfires have resulted in evacuations of several communities and First Nations as well as [fire and travel restrictions](#) across the province. Many municipalities continue to implement burning restrictions. Additional information is available through the local municipal offices or through the interactive [Current Municipal Burning Restrictions](#) map.

Out of province support are currently assisting with fire suppression efforts. Wildfires across Manitoba, Saskatchewan and northwest Ontario will continue to bring smoke into all parts of the province until conditions improve, which will be dependent on wind direction. Air quality reports are available on the Environment Canada [website](#). Learn more on the health effects of smoke exposure [here](#).

Crops & Forages

Due to the persistent drought conditions and hot temperatures, yield outlook for most crops has been downgraded this week. Grasshopper feeding has become more widespread. Crop harvest has started in parts of the Central and Interlake regions and below normal yields for spring wheat and peas are anticipated. Harvest progress indication will be posted in Crop Report Issue #16 on August 10, 2021. Please refer to the [Current Crop Topics](#) page for resources on managing crops under dry conditions.

There is currently a severe shortage of forage throughout the province and there are reports of livestock herds being sorted and culled with animals being shipped to market. First cut hay has largely finished and there will be no second cut in most areas of the province, unless significant August rains arrive along with cooler temperatures. More cereal crops are being cut for greenfeed (farmers must [contact MASC](#) prior to putting crops to alternate use). The [Manitoba Hay](#)

[Listing Service](#) is active; producers with extra feed or looking for feed are encouraged to list their available supplies for sale.

Twenty-one rural municipalities and several Northern Affairs communities have declared States of Agricultural Disaster due to persistent growing challenges including insects and lack of rainfall. The [Manitoba Farm, Rural & Northern Support Services](#) hotline is available 24/7 for farmers and ranchers dealing with crises and stressful situations by calling 1-866-367-3276.

Water Supplies

Water availability for livestock on pasture continues to deteriorate and there are continued reports of well water tables significantly lower than normal, hauling water, moving livestock or drilling new/deeper wells to secure water sources. Livestock producers who have been affected by dry conditions on pasture in Manitoba can apply for funding to support water source development under [Ag Action Manitoba](#) (BMP 503).

Persistent dry conditions have led the Pembina Valley Water Co-op (PVWC) and its 14 member municipalities to declare a State of Drought Emergency on July 28, 2021 due to low water levels on the Red River. While sufficient flow is available for Pembina Valley's needs, water levels in the Red River have dropped quickly over the last month exposing water intakes. PVWC has implemented a mandatory 15 % water use reduction for its 14 member municipalities and is exploring options for improving water intakes and building off channel storage. The City of Morden has elevated their drought stage to Extreme due to the low level of Lake Minnewasta, with water conservation restrictions that target a 30 % water use reduction. Several other communities or municipalities, such as the RM of Macdonald, have also implemented voluntary or mandatory water conservation restrictions due to low streamflows and/or groundwater levels.

Due to low levels along many rivers, several water providers have had to deploy temporary pumps as water levels have dropped below their intakes. On several highly allocated rivers, irrigators have had to temporarily reduce or cease pumping to allow water supplies for domestic, agricultural (livestock) and municipal users to replenish. Provincial water control structures are being operated to mitigate low water level conditions and balance the impacts on multiple stakeholders.

Tributary inflows in the Lake Winnipeg watershed have been below to well below normal since spring 2021, resulting in Manitoba Hydro system storage receding to below normal levels. They have adjusted their operations to conserve existing water supplies, which has placed downward pressure on hydroelectric generation and revenues.

Other impacts that may be connected to lowered water levels and high temperatures include reports of fish kills and algal blooms in water bodies across southern Manitoba. Reports of reduced production of wild berries and challenges finding medicinal plants such as sage are also being received. Encounters with wildlife such as bears may also be increasing as food supplies are impacted by drought conditions.

Past reports, drought mapping and other information and resources are available on the [Manitoba Drought Monitor](#) website.

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Manitoba Infrastructure - Reservoir level information:

<https://www.gov.mb.ca/mit/floodinfo/index.html>

Manitoba Conservation and Climate's Fire Program:

<https://www.gov.mb.ca/sd/fire/>

Manitoba Agriculture and Resource Development:

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>

Environment and Climate Change Canada:

Flow and lake level information:

http://www.wateroffice.ec.gc.ca/index_e.html

Agriculture and Agri-Food Canada:

Canadian Drought Monitor:

<https://www.agr.gc.ca/eng/agriculture-and-climate/drought-watch>

United States Drought Monitor:

<https://droughtmonitor.unl.edu/>