

Water Availability and Drought Conditions Report

SEPTEMBER 2021

Executive Summary

- This Water Availability and Drought Conditions Report provides an update on conditions throughout Manitoba for September 2021. Although drought conditions have improved slightly in some areas, above normal rainfall prior to freeze-up and throughout the winter is needed to fully alleviate the extensive dryness.
- 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 September, most of agri-Manitoba experienced severely (40 – 60 % of median) to extremely (<40 %) dry precipitation conditions with some pockets of normal (85 – 115 %) precipitation. In northern Manitoba, conditions ranged from moderately dry (60 – 85 %) in the south to above normal (>115 %) in the north.
 - Over the past three months (July, August, September), most of agri-Manitoba and northern Manitoba experienced normal to moderately dry conditions.
 - Over the past 12 months, agri-Manitoba experienced moderately to severely dry conditions. Conditions in northern Manitoba ranged from moderately dry to normal.
- As of September 30, 2021, flows and levels across southern Manitoba generally ranged from much below normal (<10th percentile) to normal (25 – 75th percentile). Flows and levels in northern Manitoba generally ranged from below normal (10th – 25th percentile) to above normal (75th – 90th percentile).
- As of the end of September, the groundwater levels on the Sandilands, Oak Lake, Assiniboine Delta, Winkler and Glenora aquifers and the carbonate aquifer at Selkirk were normal to above normal. Levels at Piney, Steinbach, Anola and Poplarfield were in the below normal to much below normal range. Local conditions may vary from monitoring and shallow aquifers with limited extent may experience water levels declining below the pump and report as dry or intermittently dry during pumping cycles. Shallow sand aquifers of limited extent and water storage 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 [here](#).
- The September 30, 2021 Canadian Drought Monitor assessment showed a slight improvement in conditions in parts of southern Manitoba. However, drought conditions continued to persist with much of agri-Manitoba still classified as D3 (extreme drought) or D4 (exceptional drought). Drought conditions extended northward, with a region of D2 (severe drought) surrounding Thompson and D0 (abnormally dry) conditions surrounding Churchill.
- Most provincial water supply reservoirs remain above 70 % of full supply level, except for Lake Minnewasta, Stephenfield Reservoir and Jackson Lake. Provincial water control structures continue to be operated to mitigate low water level conditions and balance the impacts on multiple stakeholders. Some municipalities continued implementing water conservation restrictions (either voluntary or mandatory) during September, including the Pembina Valley Water Co-op and its member municipalities.
- Soils remain dry to very dry in the top 30 cm, resulting in thick dust where harvest and fieldwork is occurring and high fire risk.

- Sufficient livestock water supply remains a concern. 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). Applications are no longer being accepted for 2021. However, the 2022 intake will open on November 8, 2021 and cover eligible expenses from April 1, 2022.
- There is currently a severe shortage of forage throughout the province. [AgriRecovery programing](#) is available to assist eligible producers with livestock feed and transportation expenses. The [Manitoba Hay Listing Service](#) is active; producers with extra feed or looking for feed are encouraged to list their available supplies for sale. See the Manitoba ARD [Dry Conditions & Drought page](#) for resources on managing livestock, forage, and crops during drought; including available financial assistance.
- 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 October 4, 2021, wildfire danger was moderate to extreme across Manitoba. Manitoba Wildfire Service reported 453 wildfires this year to date, burning a total area of 1,264,978 hectares. There are no active provincial fire or travel restrictions in place at this time.

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.

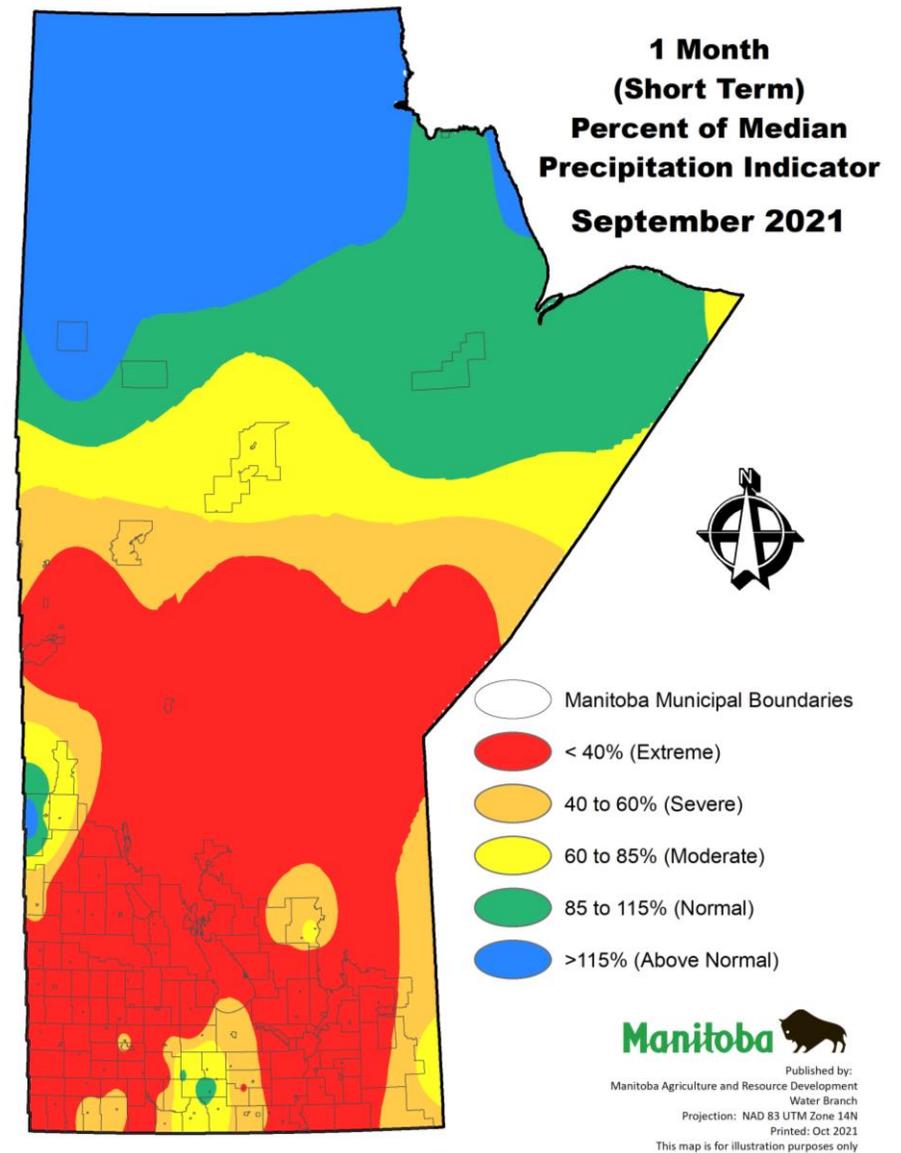


Figure 1: One month (short term) per cent of median precipitation indicator.

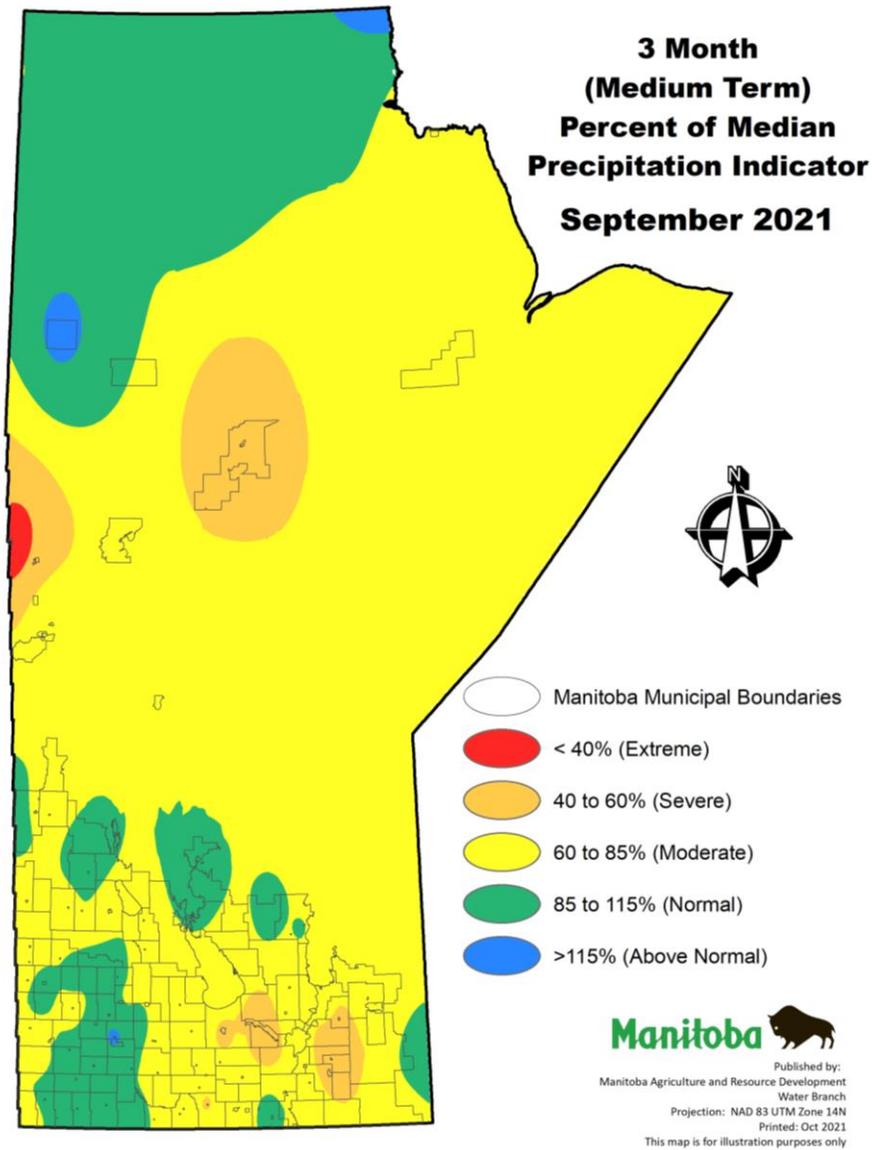


Figure 2: Three month (medium term) per cent of median precipitation indicator.

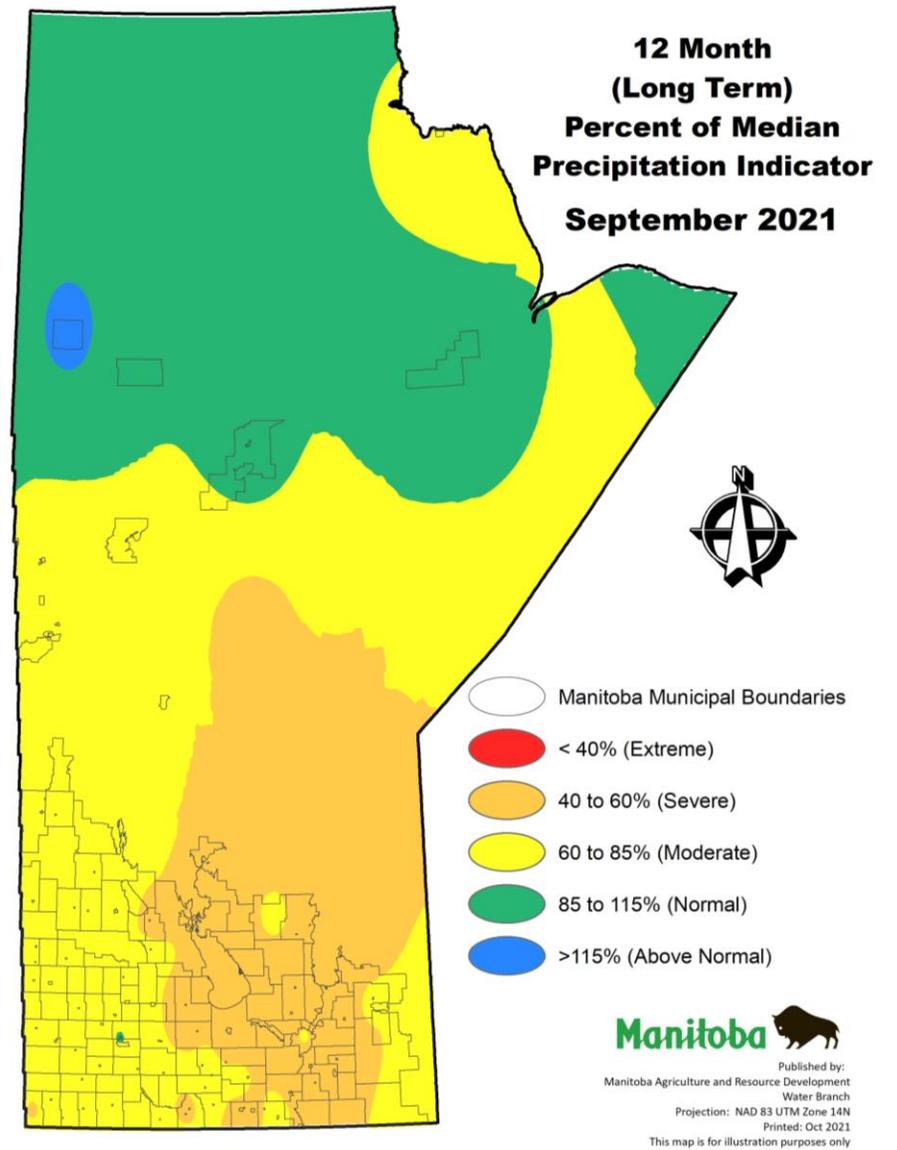


Figure 3: Twelve month (long term) per cent of median precipitation indicator.

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 September 30, 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.

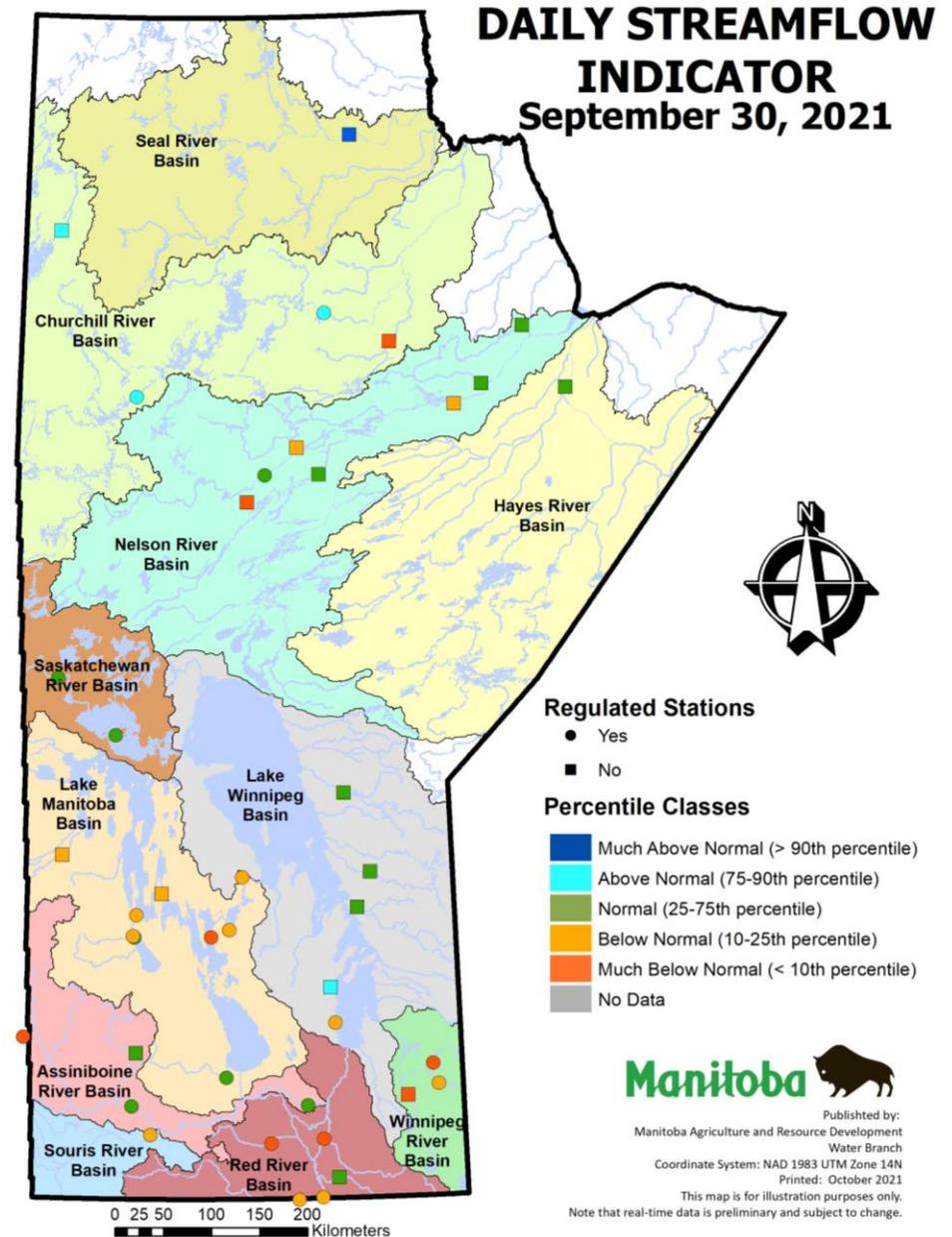


Figure 4: Daily streamflow and lake level indicator for September 30, 2021.

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. Even at low levels, most aquifers store large amounts of water and can continue to provide water during extended periods of dry weather. However, local conditions may vary from monitoring, and shallow aquifers with limited extent may experience water levels declining below the pump and reported as dry or intermittently dry during pumping cycles. 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'.

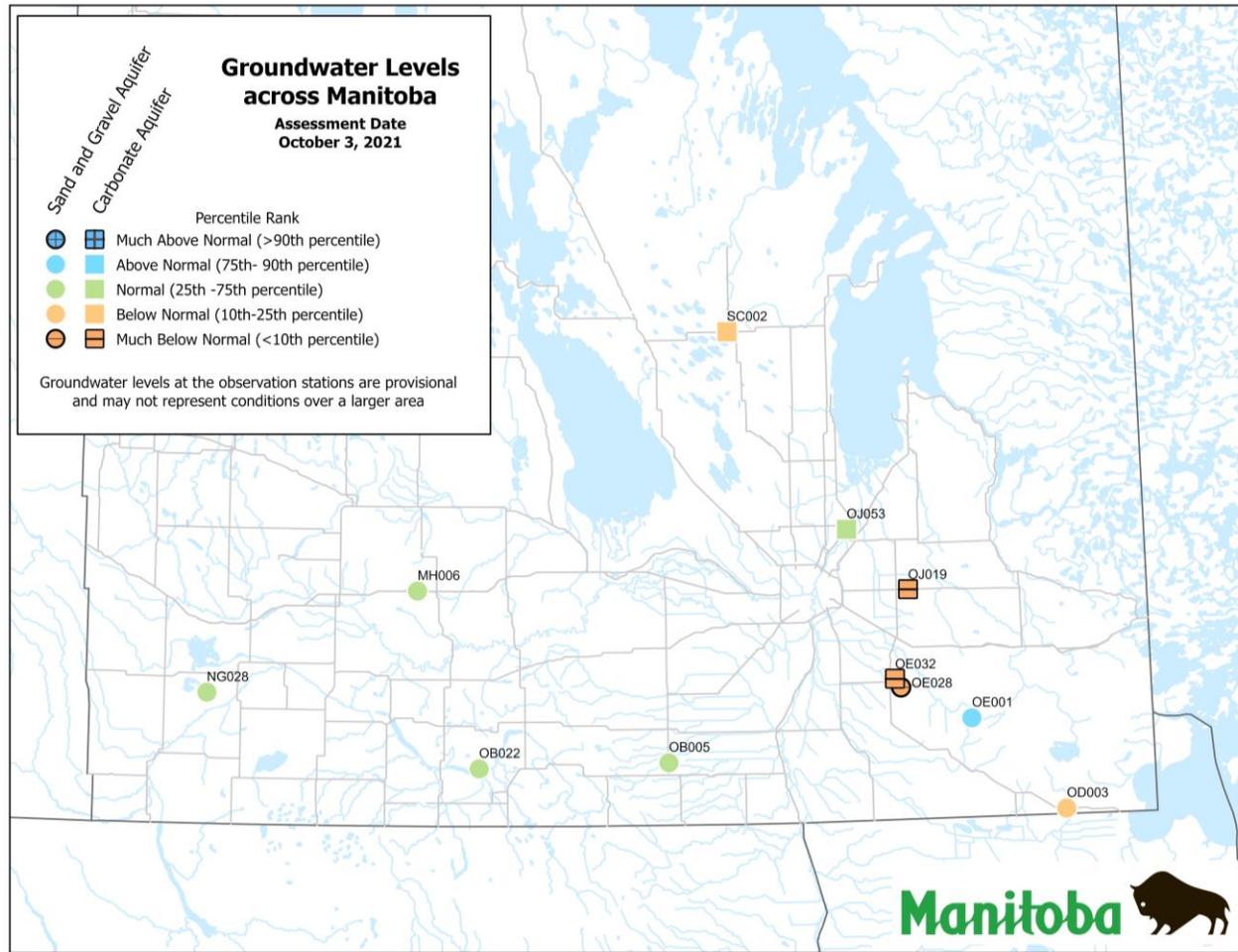


Figure 5: Groundwater indicator on September 30, 2021 for select groundwater monitoring sites.

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) or long-term (L; more than 6 months) (Figure 6).

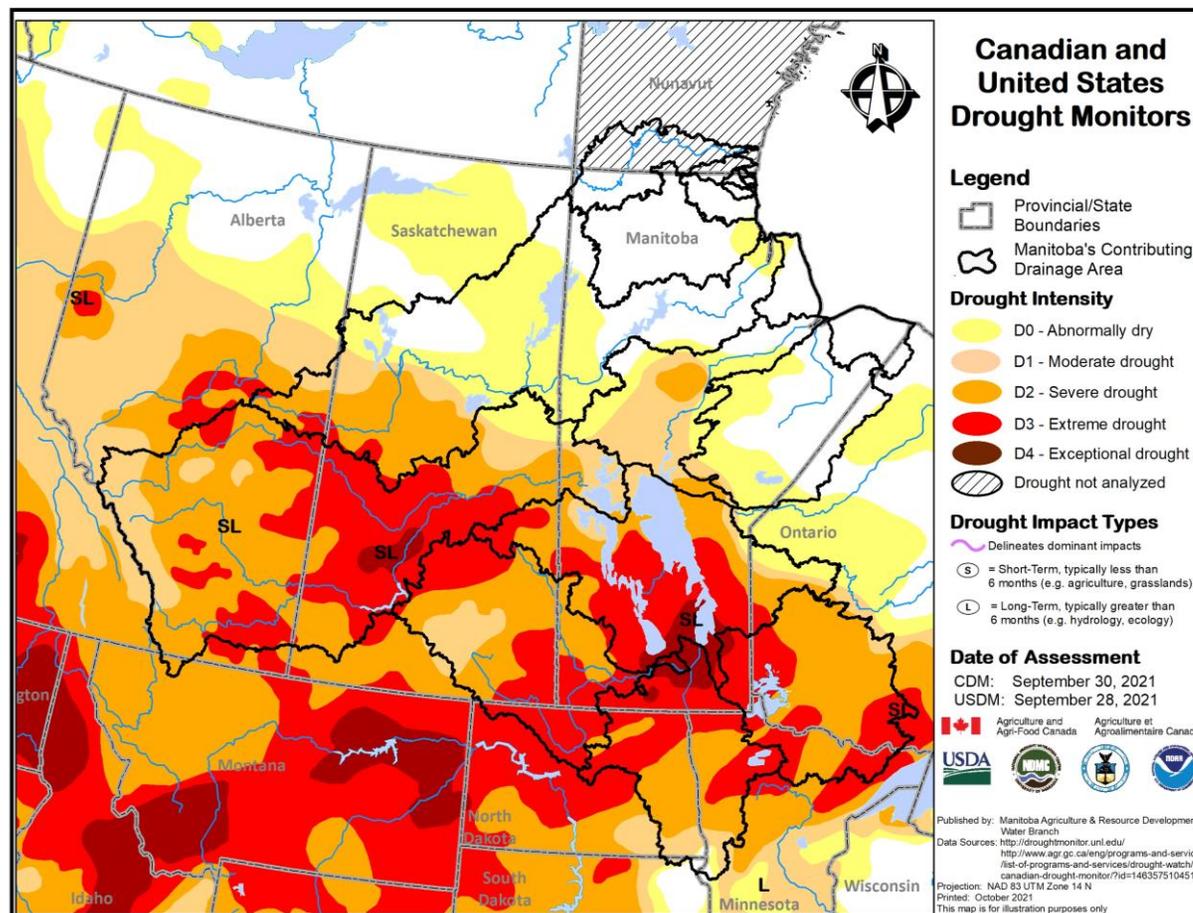


Figure 6: Canadian and United States Drought Monitors' classification of short-term (S) and long-term (L) drought conditions assessed as of September 30, 2021.

Water Availability

Reservoir Conditions – Southern Manitoba

| Water Supply Reservoir Levels and Storages - October 4, 2021 | | | | | | | | |
|--|--|---------------------|------------------------------|--------------------|--|-------------------------------------|---------------------------------------|---|
| 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, Cartier Regional Water Co-op | 1,402.5 | 1399.83 | October 4, 2021 | -2.67 | 300,000 | 267,176 | 89% |
| Lake Wahtopannah (Rivers)* | Rivers | 1,536 | 1535.46 | October 4, 2021 | -0.54 | 24,500 | 23,907 | 98% |
| Minnewasta (Morden)* | Morden | 1,082 | 1071.95 | October 4, 2021 | -10.05 | 3,150 | 1,703 | 54% |
| Stephenfield* | Carman, Pembina Valley Water Co-op | 972 | 968.92 | October 4, 2021 | -3.08 | 3,810 | 2,610 | 69% |
| Vermilion* | Dauphin | 1,274 | 1273.83 | October 4, 2021 | -0.17 | 2,600 | 2,555 | 98% |
| Goudney (Pilot Mound)* | | 1,482 | 1481.52 | October 2, 2021 | -0.48 | 450 | 416 | 92% |
| Jackson Lake* | | 1,174 | 1168.33 | October 4, 2021 | -5.67 | 2,990 | 1,641 | 55% |
| Manitou (Mary Jane)* | | 1,537 | 1535.95 | October 4, 2021 | -1.05 | 1,150 | 1,056 | 92% |
| Turtlehead (Deloraine)* | Deloraine | 1,772 | 1767.77 | October 4, 2021 | -4.23 | 1,400 | 1,086 | 78% |
| Lake Irwin* | | 1,178 | 1176.34 | October 4, 2021 | -1.66 | 3,800 | 2,936 | 77% |
| Minnedosa* | | 1,682 | 1681.09 | October 4, 2021 | -0.91 | 1,688 | 1,442 | 85% |
| Boissevain* | Boissevain | 1,697 | 1694.92 | October 4, 2021 | -2.08 | 505 | 361 | 71% |
| Kenton Reservoir | | 1,448 | 1446.36 | September 28, 2021 | -1.64 | 600 | 509 | 85% |
| Killarney Lake | | 1,615 | 1613.23 | August 11, 2021 | -1.77 | 7,360 | 6,546 | 89% |
| Elgin | | 1,532 | 1530.90 | September 28, 2021 | -1.10 | 520 | 443 | 85% |
| St. Malo | | 840 | 839.82 | September 29, 2021 | -0.18 | 1,770 | 1,742 | 98% |

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 24 (published October 5, 2021) are provided in Table 1.

Table 1: On Farm Water Supply (Dugout) Conditions.

| Region | General Dugout Condition |
|-----------|---|
| Eastern | No recent update. |
| Interlake | Rains in mid August temporarily increased dugout water levels, which have now begun to decline. New wells continue to be drilled throughout the region. (September 28, 2021) |
| Southwest | Dugouts are about 30 to 40 % of full capacity. |
| Central | Water availability is somewhat improved, but surface supply and quality is still low and will require recharging for next year. Many dugouts have been deepened to access more water. |
| Northwest | Water supplies on pastures are poor and require a significant recharge for grazing in the next season. |

Soil Moisture

A regional representation of soil moisture conditions for the top 120 cm relative to the field capacity is shown for October 3, 2021.

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.

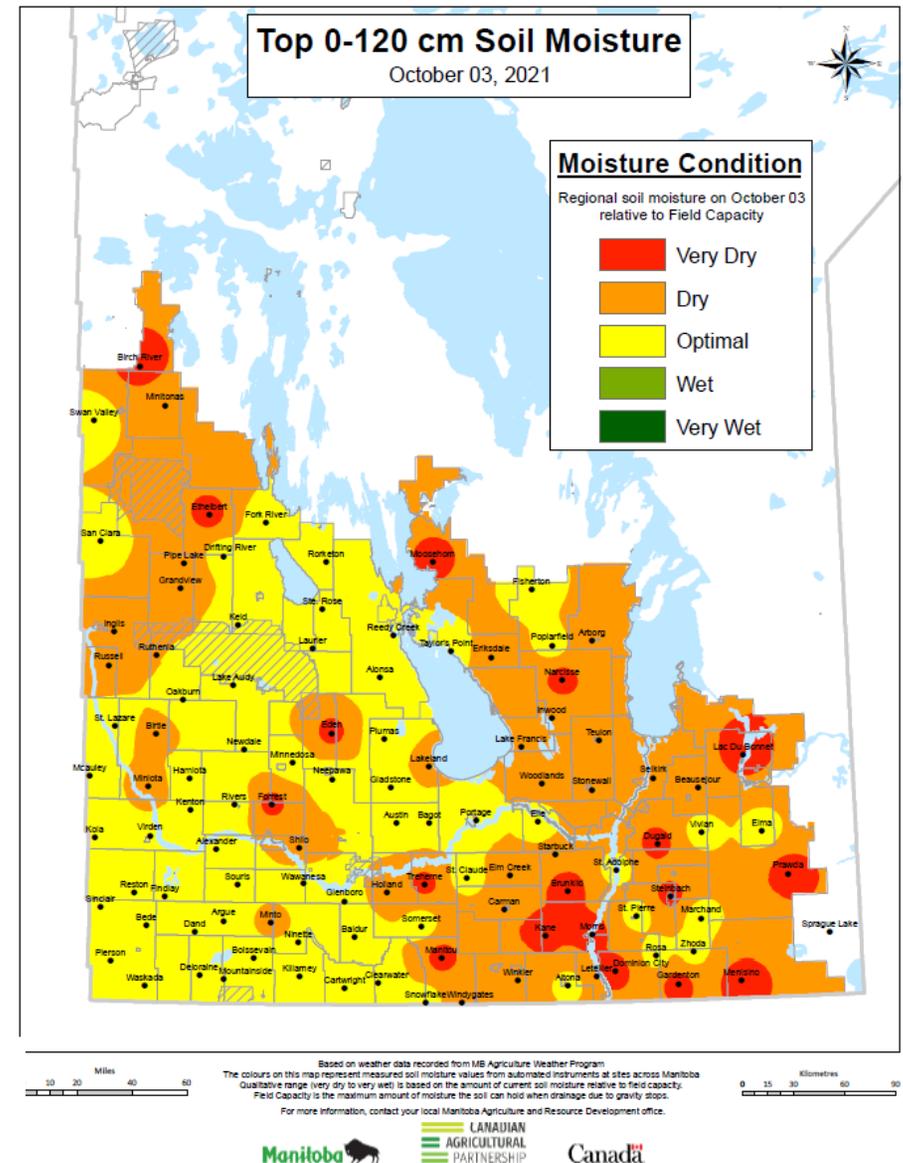


Figure 7: Manitoba Agriculture and Resource Development's October 3, 2021 mapping of soil moisture conditions in the top 0 – 120 cm.

Wildland Fires

As of October 4, 2021, the Manitoba Wildfire Service reported 453 wildfires this year to date, burning a total area of 1,264,978 hectares. Most of the burned area occurred in the eastern region. The fire danger is generally moderate to extreme as many areas are experiencing increased fire danger conditions due to above average temperatures, minimal recent precipitation and continued high to extreme drought code (DC) conditions.

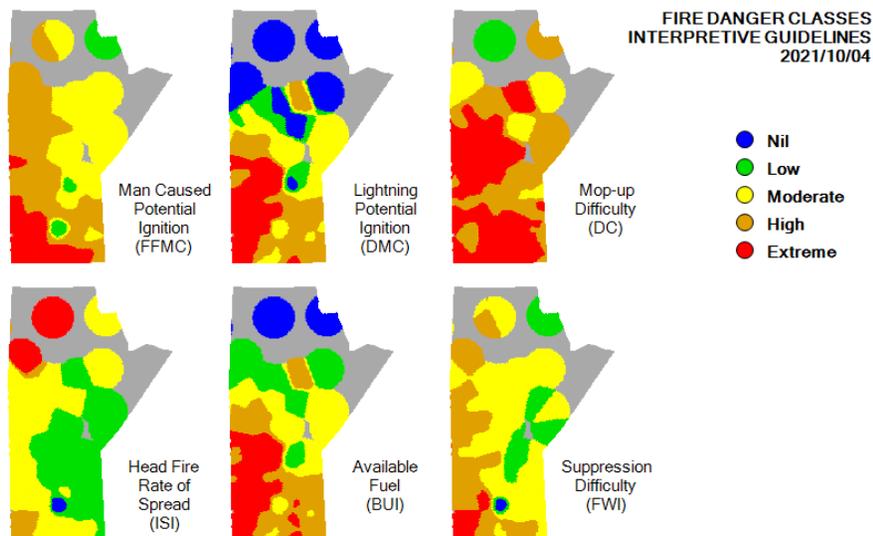


Figure 8: Fire Danger mapping by the Manitoba Wildfire Service.

Some municipalities continue to implement burning restrictions. Additional information is available through the local municipal offices or through the interactive [Current Municipal Burning Restrictions](#) map. There are no active provincial fire or travel restrictions in place at this time.

Drought Impacts

Crops & Forages

Continued warm, dry weather has helped harvest move towards completion. Average harvest completion across all regions of the province has reached 95 %. Please see the weekly [Crop Reports](#) for information on harvest progress and crop yield and quality.

Soils remain dry to very dry in the top 30 cm, causing thick dust to hang over rural areas where harvest and fieldwork is occurring. Very dry soils combined with the winds and heat has resulted in dry crop residues and pastures facing a very high fire risk. Most areas are looking for post-harvest rain to benefit soil moisture levels for next year and improve soil tillage condition.

The lack of rain is again leading to slow pasture growth. Pastures had regrown to provide sufficient fall grazing but are slowing down and are almost finished due to dryness and the time of the year.

There is currently a severe shortage of forage throughout the province. Producers are being very innovative in their efforts to ensure they have sufficient feed supplies for the winter. [AgriRecovery programing](#) is available to assist eligible producers with livestock feed and transportation expenses. The [Manitoba Hay Listing Service](#) is active; producers with extra feed or looking for feed are encouraged to list their available supplies for sale.

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

Sufficient livestock water supply remains a concern. 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). Applications are no longer being accepted for 2021. However, the 2022 intake will open on November 8, 2021 and cover eligible expenses from April 1, 2022.

Provincial water control structures are being operated to mitigate low water level conditions and balance the impacts on multiple stakeholders. Water use has recently decreased as the end of irrigation season approaches. Despite the low flow conditions and temporary restrictions, most water users received their licensed volumes for 2021. Fall rains are needed to increase soil moisture and baseflows prior to freeze-up and to increase runoff potential in the spring.

Several municipalities and water providers continue to implement mandatory or voluntary conservation restrictions, including the Pembina Valley Water Co-op and its 14 member municipalities, due to low streamflows and/or groundwater levels. Some municipal water systems on surface water sources continue to use temporary pumps as water levels have dropped below intakes. There are some concerns over water levels and ice formation heading into winter.

Departments are tracking and actively managing several water supply “hot spots” including the Red River and Lake Minnewasta. Manitoba, through multiple departments, is supporting municipalities and water providers by providing conditions updates, engineering, technical and planning support, regulatory approvals and guidance, and in some cases, funding support through the Manitoba Water Services Board.

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

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

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/>