

Drought Background and Conditions Update

*North Red River, Interlake and
Northern Manitoba*

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Agriculture and Resource Development
March 10, 2021



Outline

- **Drought Background**
 - Manitoba Drought Management Strategy
 - What is drought?
 - Monitoring and reporting
 - Water allocation
 - Transboundary water management
 - Provincial drought response
- **Current Conditions**
 - Drought Indicators
 - Fall soil moisture
 - Winter Precipitation
 - Streamflows/lake levels
 - Reservoirs
 - Groundwater levels
 - Drought Monitor
- **Information Sources**

DROUGHT BACKGROUND

*The **Manitoba Drought Management Strategy** was released in January, 2016*

- Why a Drought Strategy?
 - Provides a framework for a **proactive and integrated** approach to managing droughts
 - Defines a **science-based** process to declare and respond to drought
 - Helps to **identify vulnerabilities** and **improve preparedness** for future droughts
 - **Increases public awareness** of drought impacts and mitigation options
- 14 action items in outlined in strategy



Defining Drought

Drought is a natural hazard caused by a shortage of water resulting in direct effects on both human and environmental wellbeing, for a given period of time, for any location(s) where natural or managed water systems fail to meet the typical water demand for human and environmental uses

Progression of Drought

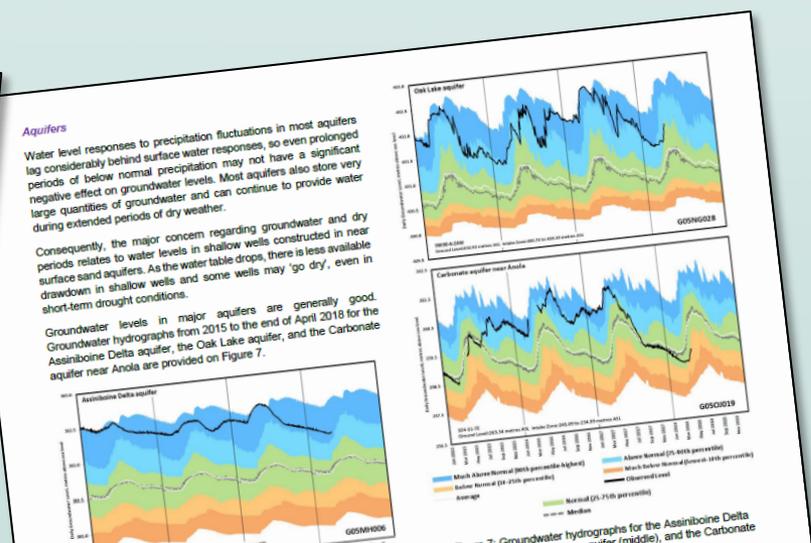
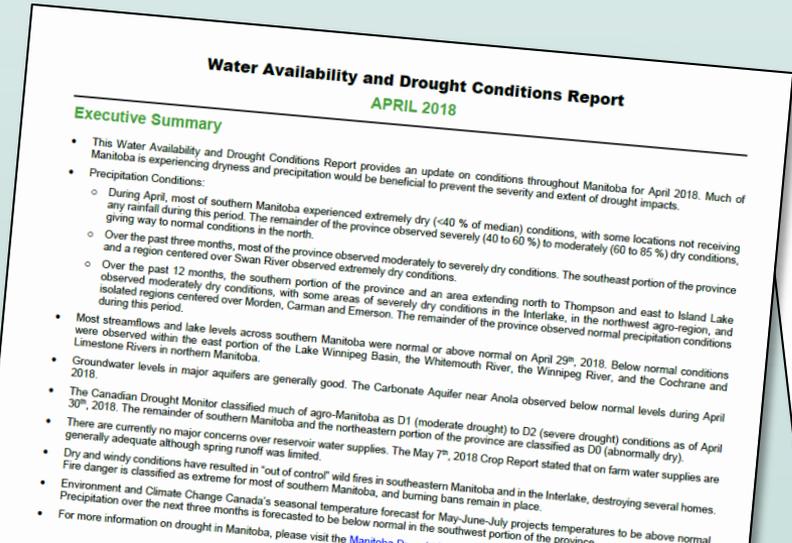
TIME



- ***Meteorological Drought***
 - Generally defined by comparing the rainfall in a particular place and at a particular time with the average rainfall for that place. Meteorological drought leads to a depletion of soil moisture and this almost always has an impact on agricultural production.
- ***Agricultural Drought***
 - Occurs when there is not enough water available for a particular crop to grow at a particular time.
- ***Hydrological Drought***
 - Associated with the effect of low rainfall on water levels in rivers, reservoirs, lakes and aquifers. Hydrological droughts are usually noticed some time after meteorological droughts.
- ***Socioeconomic Drought***
 - Occurs when the supply fails to meet the demand for an economic good(s) such as domestic water supplies, hay/forage, food grains, fish, and hydroelectric power, due to weather related water supply shortages from one or both of natural or managed water systems.

Water Availability and Drought Conditions Reports

- Published monthly from April through October
 - Summary of drought indicators and water supply status
 - Reported drought impacts
- Drought committees are critical for the exchange of information and providing “on the ground” reports of conditions and impacts
- Reporting will occur more often as drought becomes more severe



Reporting on Drought

www.gov.mb.ca/drought

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[Drinking Water](#)

Drought Conditions

[Groundwater and Surface Water](#)

[Lakes, Beaches and Rivers](#)

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Manitoba Drought Management Strategy

The information below highlights the drought management efforts currently underway in Manitoba. The Manitoba Drought Management Strategy provides an overarching framework and action strategies for an integrated approach to minimize the impacts of drought on Manitoba's people, economy and environmental resources.

Monitoring and reporting are key to drought management. Up to date information on water availability and drought conditions is accessible below, while our suite of drought indicators can be viewed interactively on the Drought Indicator Map.

We are working to better understand the impacts of drought on Manitobans and to build our resiliency through increased drought preparedness. Have you seen drought impacts on your area? Let us know! Please send us an email at drought@gov.mb.ca.

Additional information, including as links to various resources, can be found in the Resources and Contacts tab.

[Manitoba Drought Management Strategy](#)

[Conditions Reports](#)

[Drought Indicator Map](#)

[Drought Impacts](#)

[Drought Preparedness](#)

[Resources & Contacts](#)

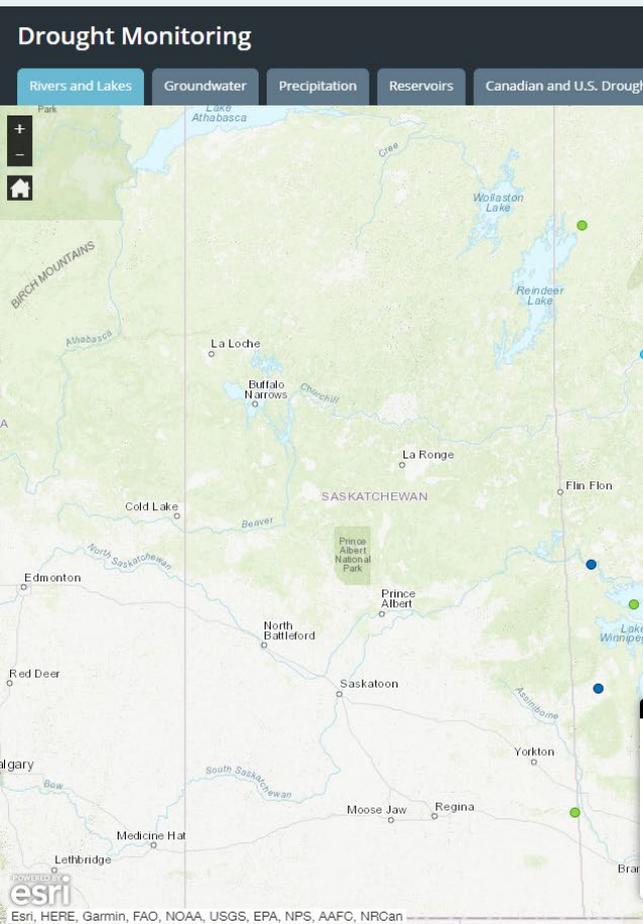


Reporting on Drought

www.gov.mb.ca/drought

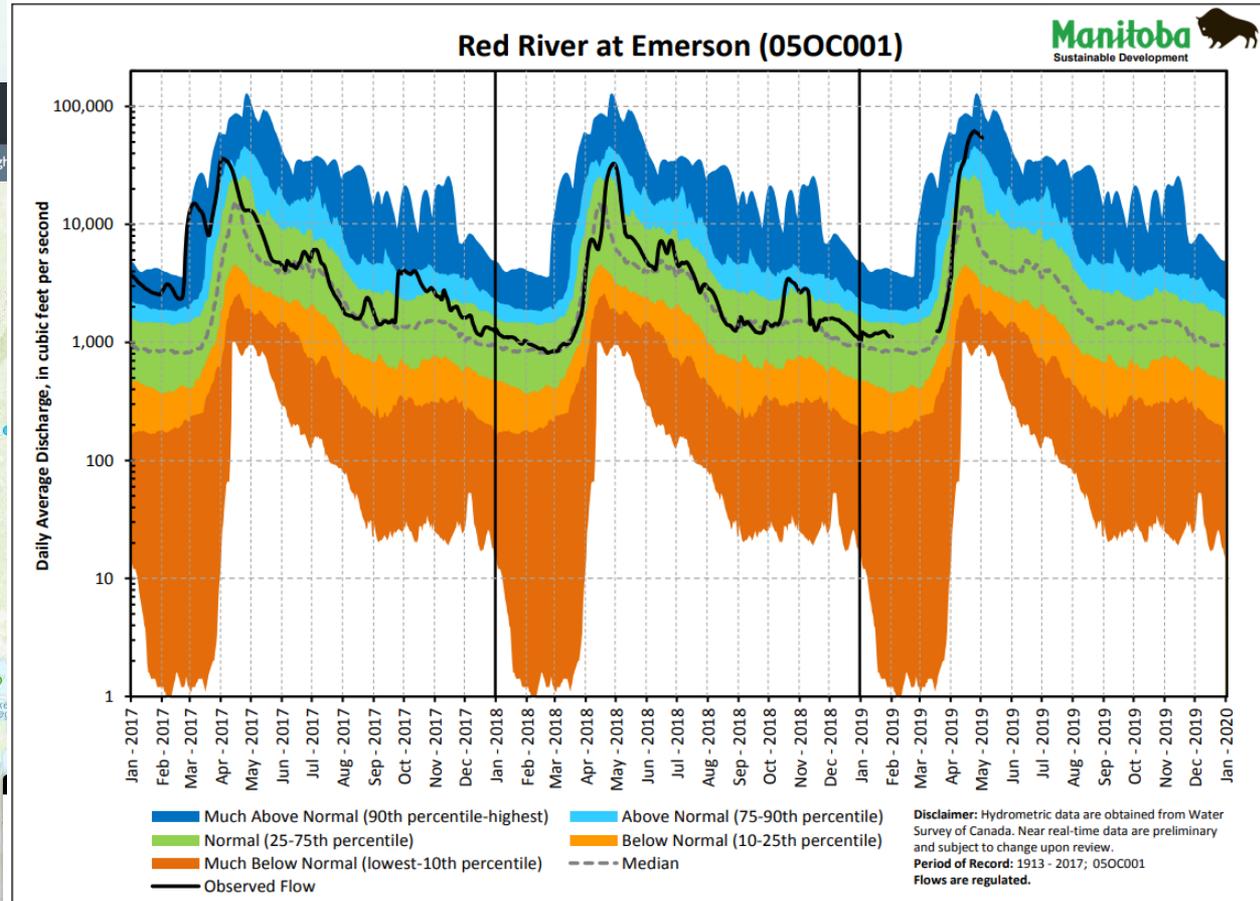
Drought Monitoring

Rivers and Lakes | Groundwater | Precipitation | Reservoirs | Canadian and U.S. Drought



Map showing the Red River basin in Saskatchewan, Canada, with various locations marked including La Loche, Buffalo Narrows, Churchill, La Ronge, Flin Flon, Cold Lake, Prince Albert National Park, Prince Albert, North Battleford, Saskatoon, Yorkton, Regina, Moose Jaw, Medicine Hat, and Lethbridge. The map also shows the North Saskatchewan River, South Saskatchewan River, and Lake Winnipeg.

esri
Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS, AAFC, NRCAN



Percentile Plot

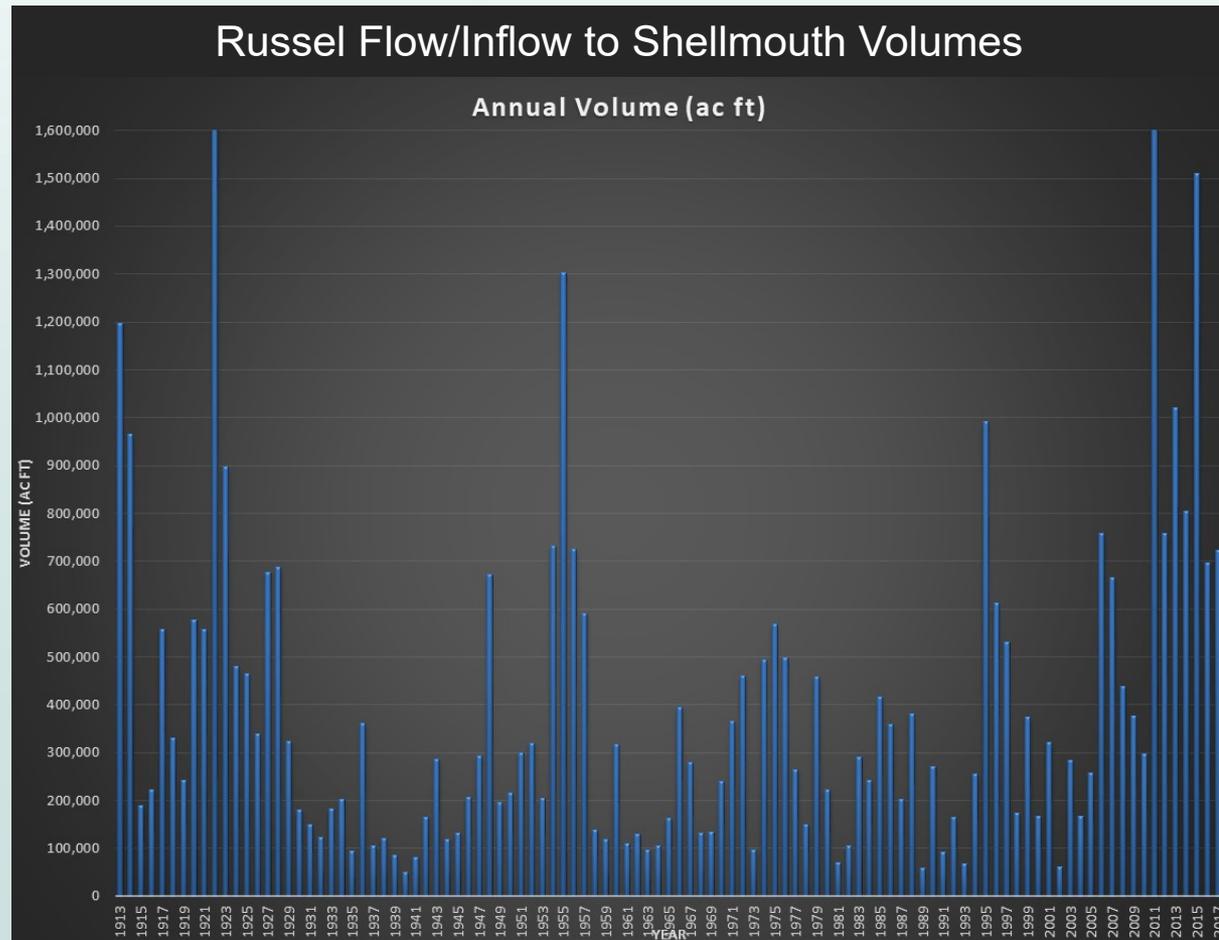
Zoom to



Map showing the location of Emerson, Manitoba, on the Red River. The map includes labels for Lake Nipigon, Nipigon, and Emerson.

The challenge to managing water supply is variability

- Annual volumes can range by more than an order of magnitude
- Pattern of multi-year wet and dry periods
- How to plan sustainable water usage?
 - Appropriate risk levels for users
 - Regulated (main stem) vs. unregulated (tributaries) supply
 - Aquifer discharge or recharge
 - Ecosystem health
 - Economic development



Manitoba uses The Water Rights Act to administer water usage

- **3(1) Prohibition against use of water:**

Except as otherwise provided in the Act or the regulations, no person shall, in any manner whatsoever use or divert water, unless he or she holds a valid and subsisting licence to do so.

Exceptions are domestic, agricultural and irrigation use that is less than 25,000 L/day. All other use requires a Water Use Licence

- **8(1) Precedence of licenses:**

Licenses have precedence in relation to one another according to the date of the submission of application for each license.

How is water allocated?

- Manitoba Conservation and Climate's Water Use Licensing Section administers The Water Rights Act and assesses each application received
- Sustainable water use is assessed by engineers and geoscientists in the Water Branch (ARD) who provide input to Conservation and Climate
- Sustainable water use is assessed for each potential source:
 - Aquifers have sustainable yields based on aquifer recharge rates (Oak Lake Aquifer, Assiniboine Delta Aquifer)
 - Reservoirs have “firm annual yields” that account for multi-year storage (Stephenfield, Rivers, Shellmouth Reservoirs)
 - Intermittent tributaries are allocated based on the 5-year low-flow volume for each season; 50% for human use, 50% to support ecosystem function

Manitoba has long-standing water supply agreements with upstream neighbors

- International Joint Commission (1940s)
 - On the Souris River, North Dakota provides Manitoba a minimum of 20 cfs from June to October (1959)
- Prairie Provinces Water Board (1948) – Master Agreement on Apportionment (1969)
 - For Assiniboine River Basin streams, Saskatchewan obligated to pass Manitoba one-half of the natural annual flow arising in the Province of Saskatchewan



Drought committees and groups help to share information and coordinate drought management activities

- **Manitoba Drought Assessment Committee**
 - High level guidance for provincial drought management
 - Various government departments and agencies
- **Interdepartmental Water Supply Working Group**
 - Focus specifically on surface and groundwater supply and demand issues



During past periods of dryness, provincial programs have been implemented to mitigate impacts

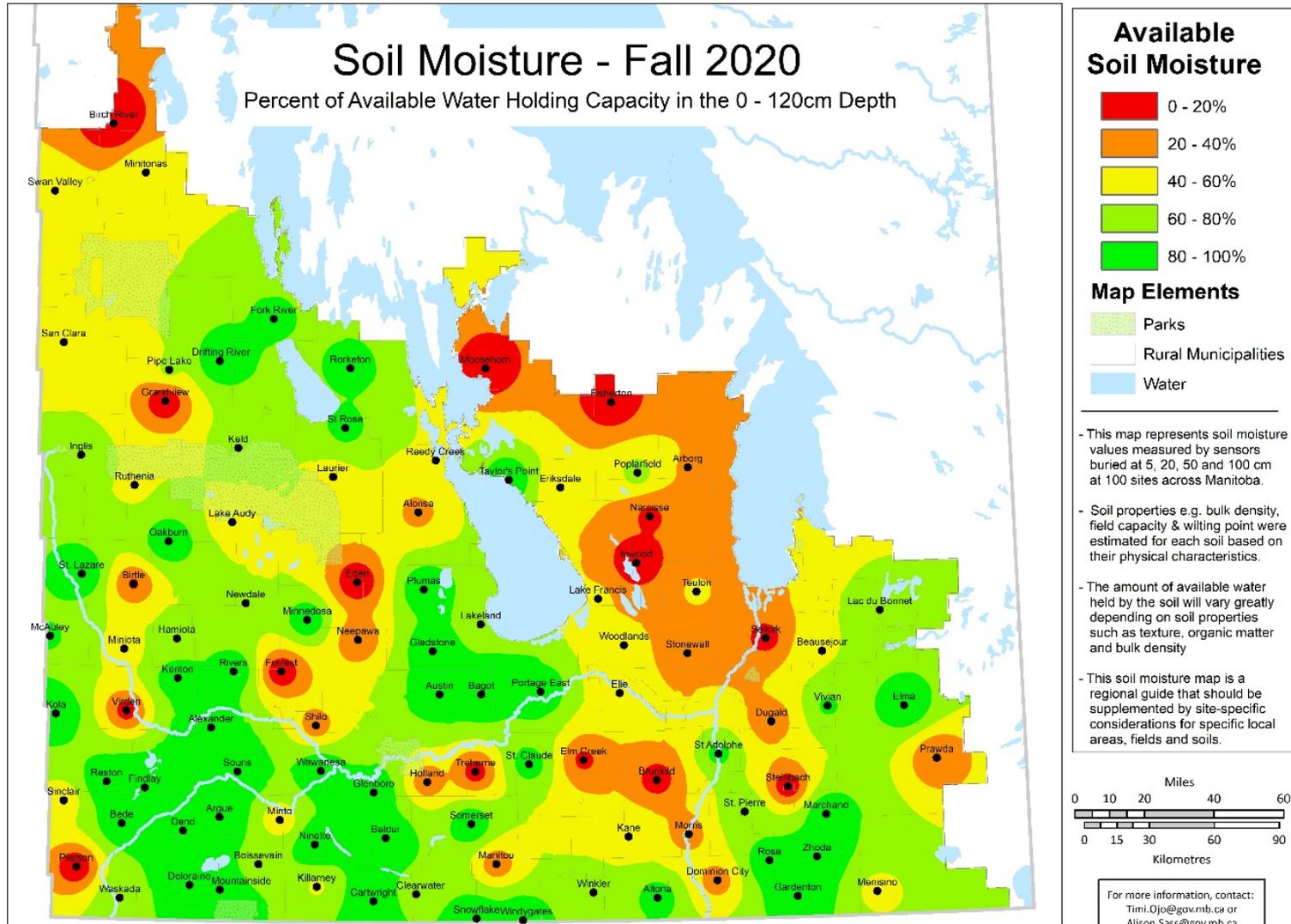
- During the recent dry conditions in 2018 and 2019, Agriculture and Resource Development supported impacted farmers by:
 - Funding available through Ag Action Manitoba for water source development
 - Hay Disaster Benefit for forage producers insured through the select and basic Hay Agri-Insurance Programs
 - Temporarily allowing livestock producers to cut hay and graze animals on Crown land
- Manitoba is closely monitoring conditions and any next steps for 2021

Emergency Drought Response

- The Manitoba Emergency Measures Organization (EMO) remains focused on the consequence management aspects of a drought event:
 - Maintaining drought hazard awareness through engagement of and briefings from various departments/agencies
 - Liaison with local authorities to gather situational awareness for assessment and reporting and to advise on development of emergency plans
- EMO will remain prepared to manage or assist with an emergent situation where community(ies) no longer have a source of water for people or where livestock welfare issues are at stake
 - Activation of the Manitoba Emergency Coordination Centre would occur if necessary
 - EMO involvement would be done in conjunction with all key provincial partners

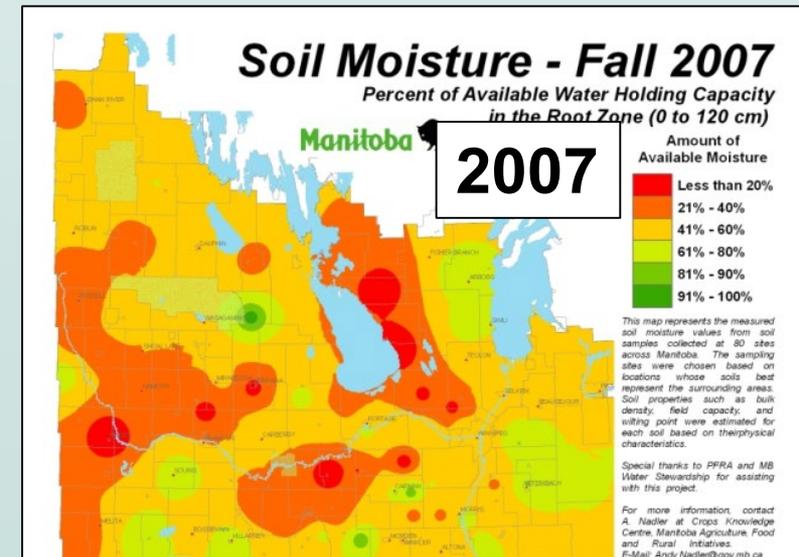
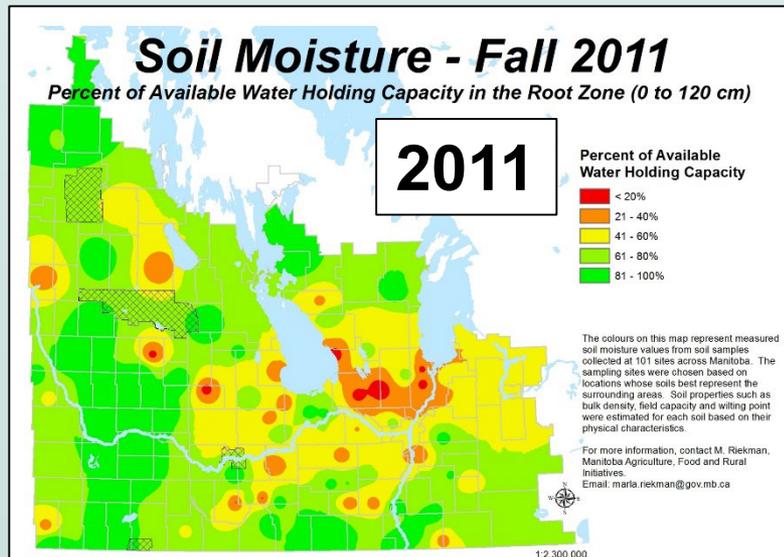
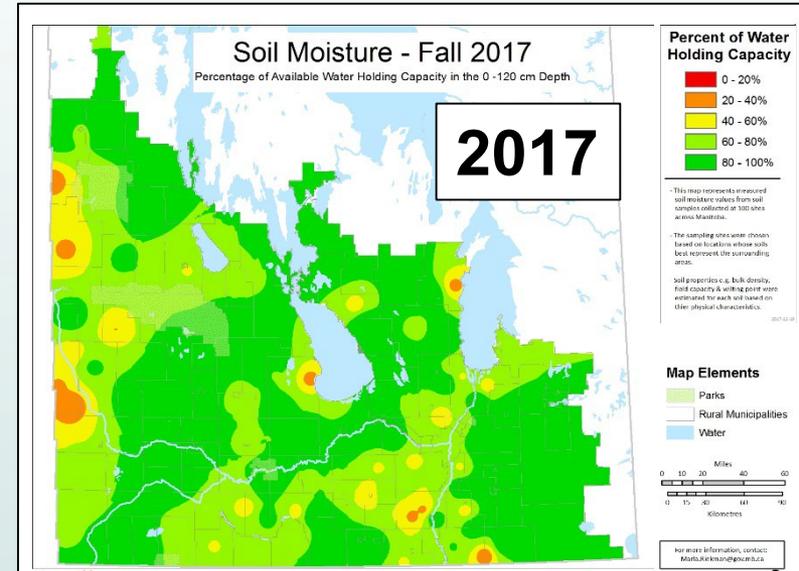
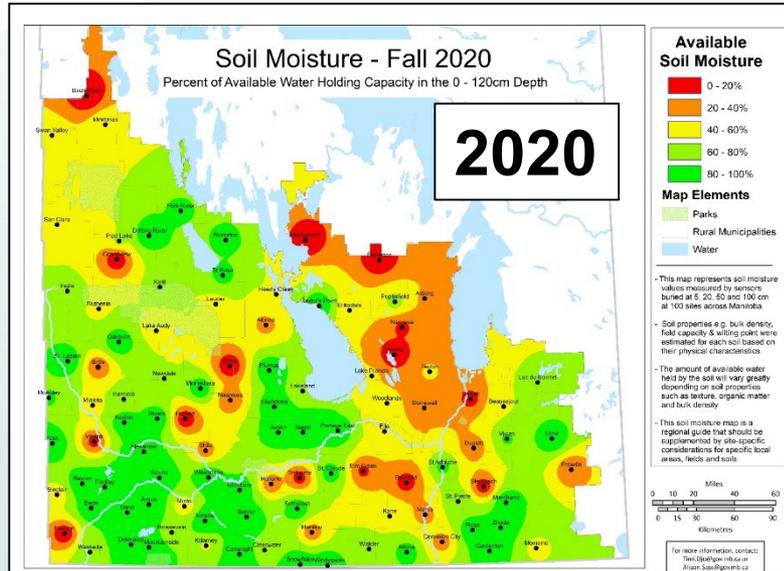
CURRENT CONDITIONS

Fall Soil Moisture – 2020



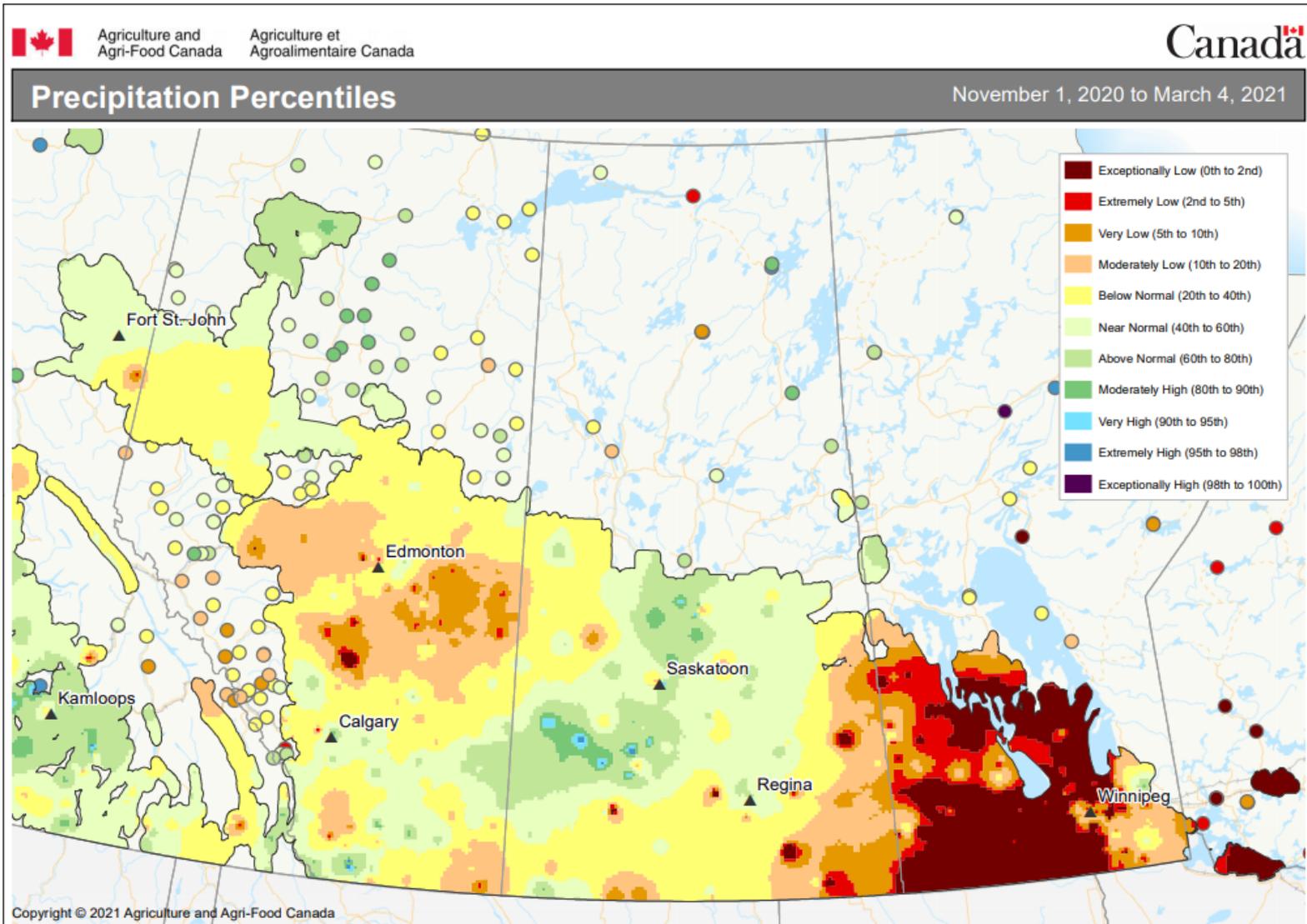
2020-12-09

Fall Soil Moisture – other dry years



Winter Precipitation

November 1, 2020 – March 4, 2021



Prepared by Agriculture and Agri-Food Canada's Science and Technology Branch. Data provided through partnership with Environment Canada, Natural Resources Canada, Provincial and private agencies.
Produced using near real-time data that has undergone some quality control. The accuracy of this map varies due to data availability and potential data errors.

Created: 2021-03-05
www.agr.gc.ca/drought

Winter Precipitation



Other dry years: 2017/18; 2011/12

**Current:
2020/2021**

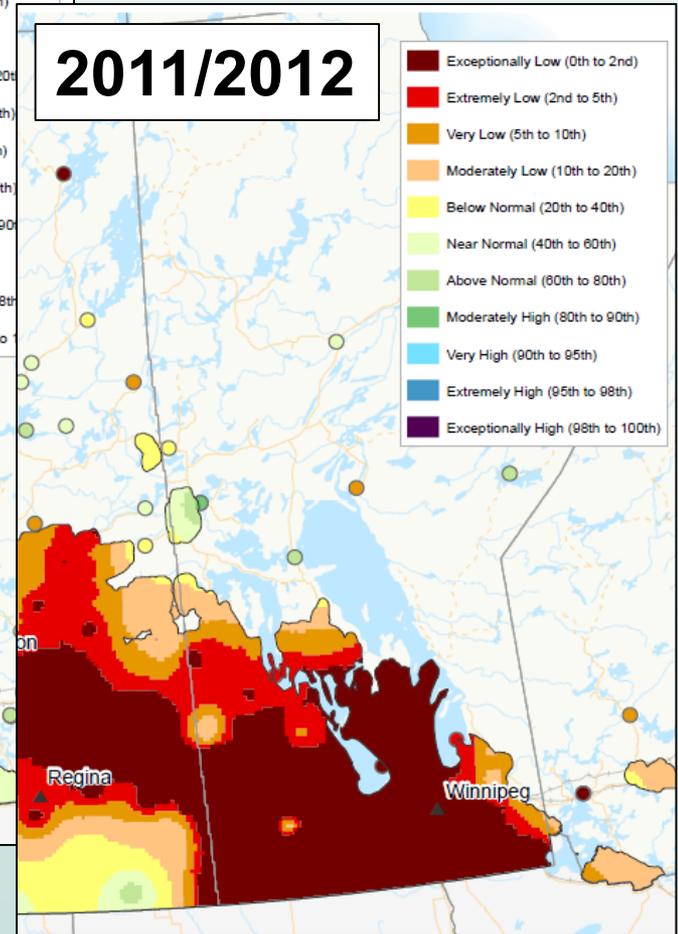
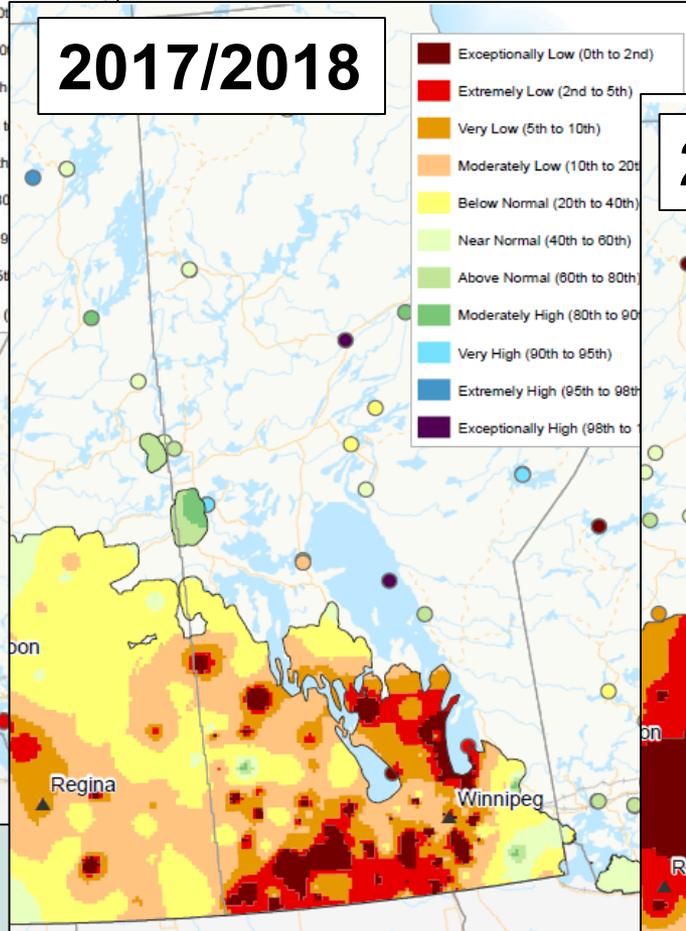
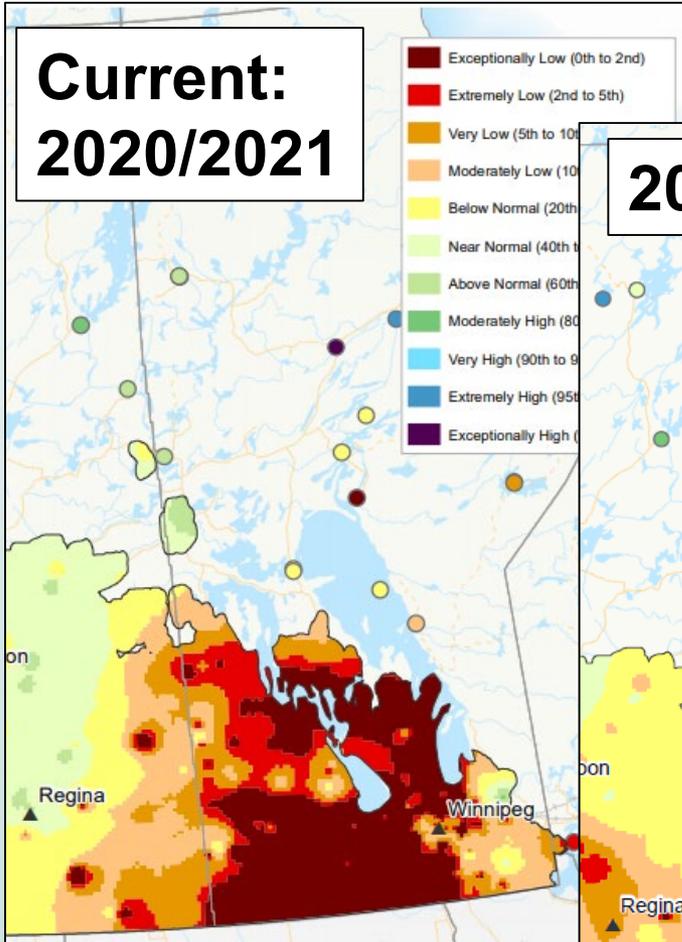
- Exceptionally Low (0th to 2nd)
- Extremely Low (2nd to 5th)
- Very Low (5th to 10th)
- Moderately Low (10th to 20th)
- Below Normal (20th to 40th)
- Near Normal (40th to 60th)
- Above Normal (60th to 80th)
- Moderately High (80th to 90th)
- Very High (90th to 95th)
- Extremely High (95th to 98th)
- Exceptionally High (98th to 100th)

2017/2018

- Exceptionally Low (0th to 2nd)
- Extremely Low (2nd to 5th)
- Very Low (5th to 10th)
- Moderately Low (10th to 20th)
- Below Normal (20th to 40th)
- Near Normal (40th to 60th)
- Above Normal (60th to 80th)
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- Extremely High (95th to 98th)
- Exceptionally High (98th to 100th)

2011/2012

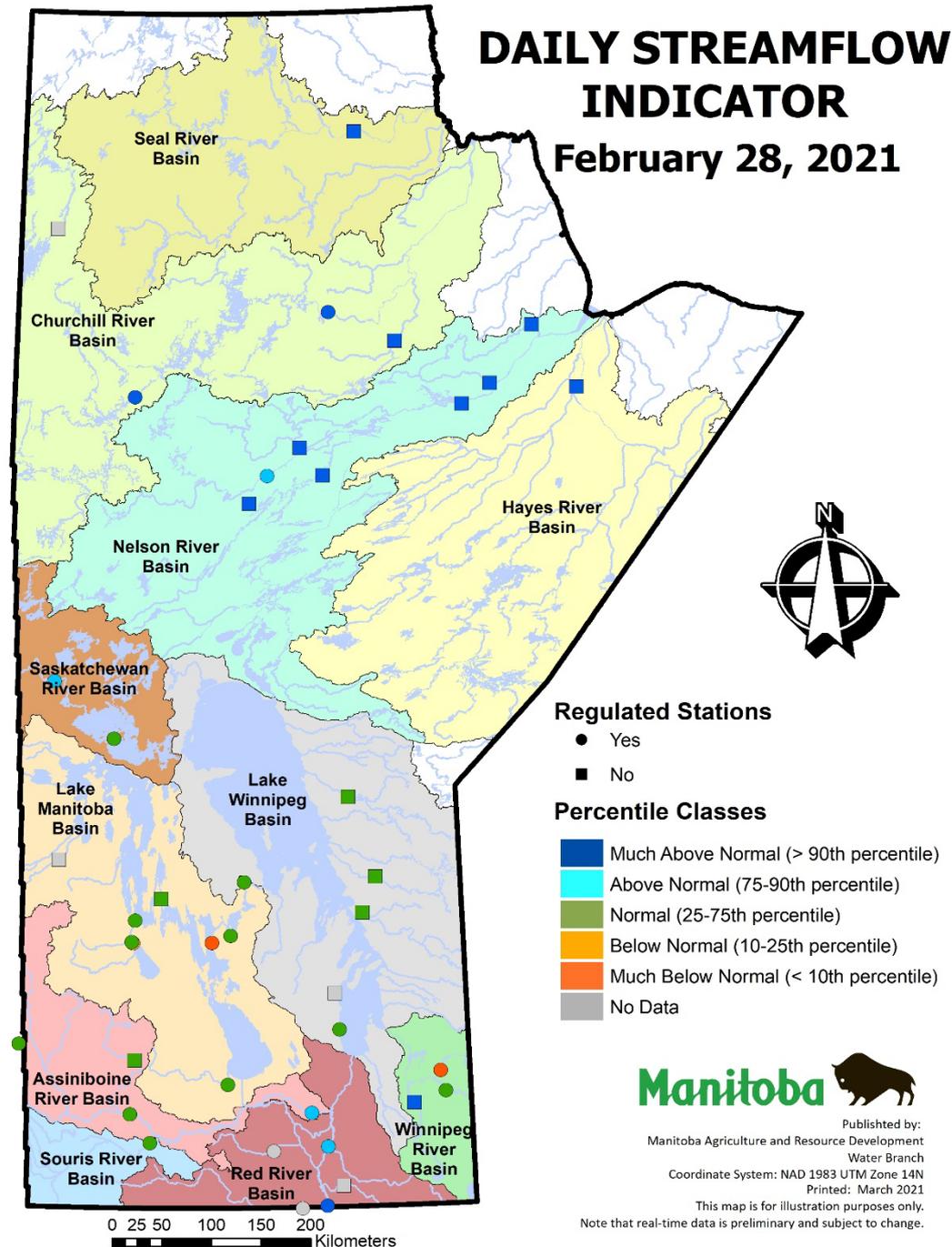
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Streamflow & Lake Levels - February 28, 2021

DAILY STREAMFLOW INDICATOR

February 28, 2021



Manitoba 

Published by:
Manitoba Agriculture and Resource Development
Water Branch
Coordinate System: NAD 1983 UTM Zone 14N
Printed: March 2021

This map is for illustration purposes only.
Note that real-time data is preliminary and subject to change.

Water Supply Reservoirs

March 1, 2021



Drought Monitoring

Rivers and Lakes

Groundwater

Precipitation

Reservoirs

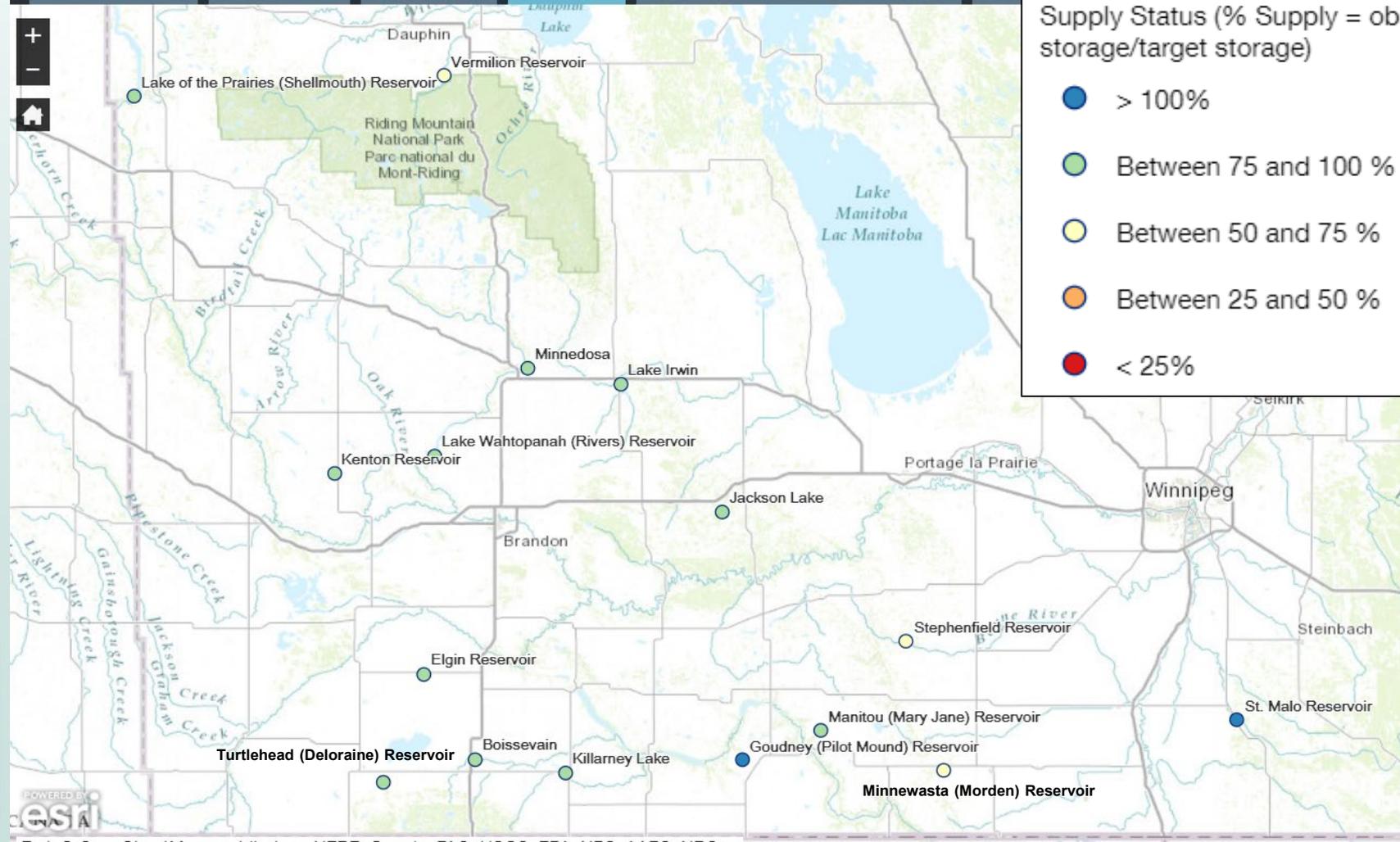
Canadian and U.S. Drought Monitor

Info

Reservoir Supply Status

Supply Status (% Supply = observed storage/target storage)

- > 100%
- Between 75 and 100 %
- Between 50 and 75 %
- Between 25 and 50 %
- < 25%

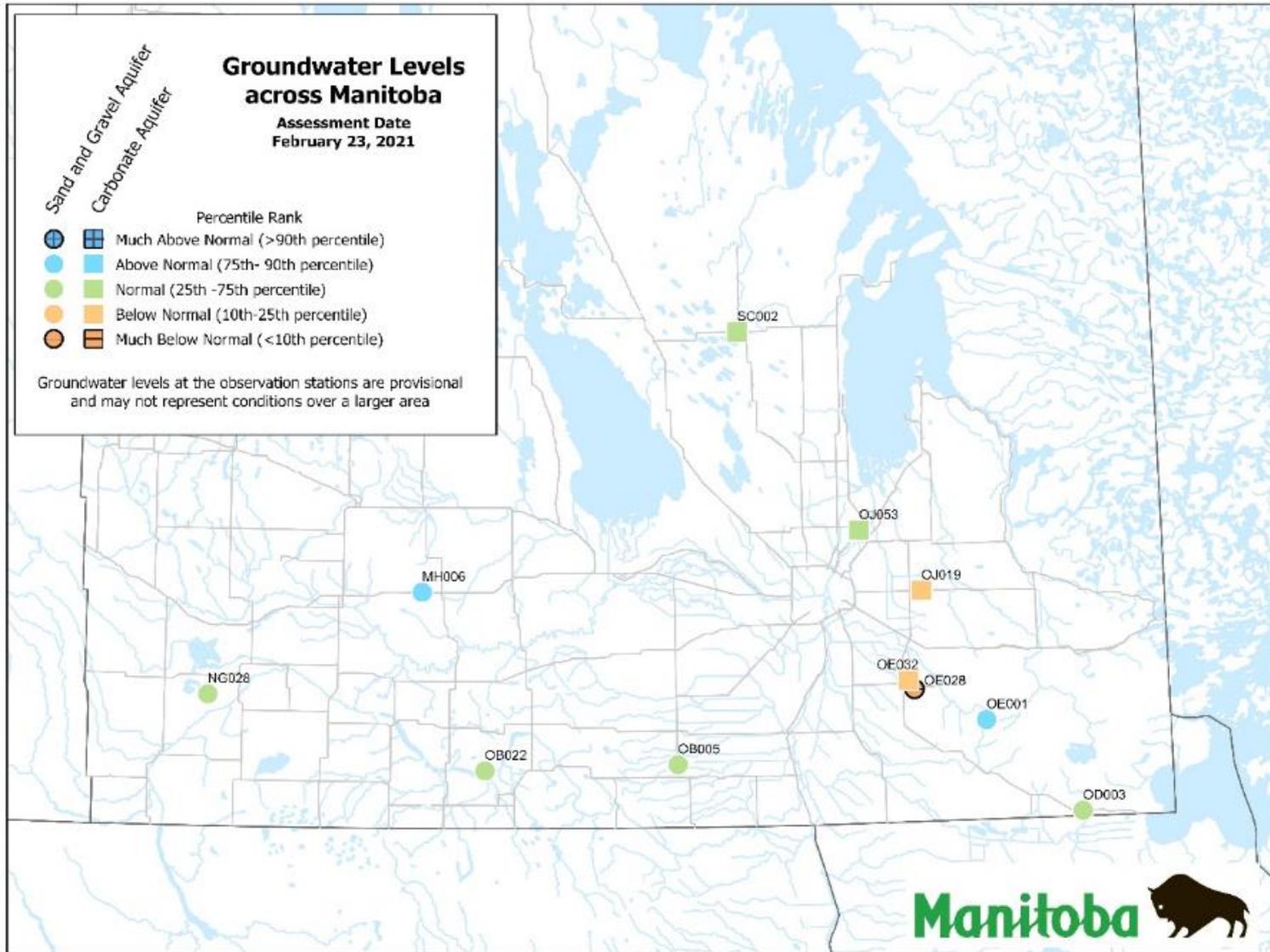


Groundwater

- General Comments:
 - Aquifer water levels will respond differently depending on a number of factors including the depth to the aquifer, the composition of the material overlying the aquifer, aquifer material, and whether an aquifer is confined or unconfined.
 - Water levels in most aquifers lag 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.
 - The major concern regarding groundwater and dry periods relates to water levels in shallow wells.

Groundwater

Current levels from 'real time' stations



Carbonate Aquifer near Selkirk

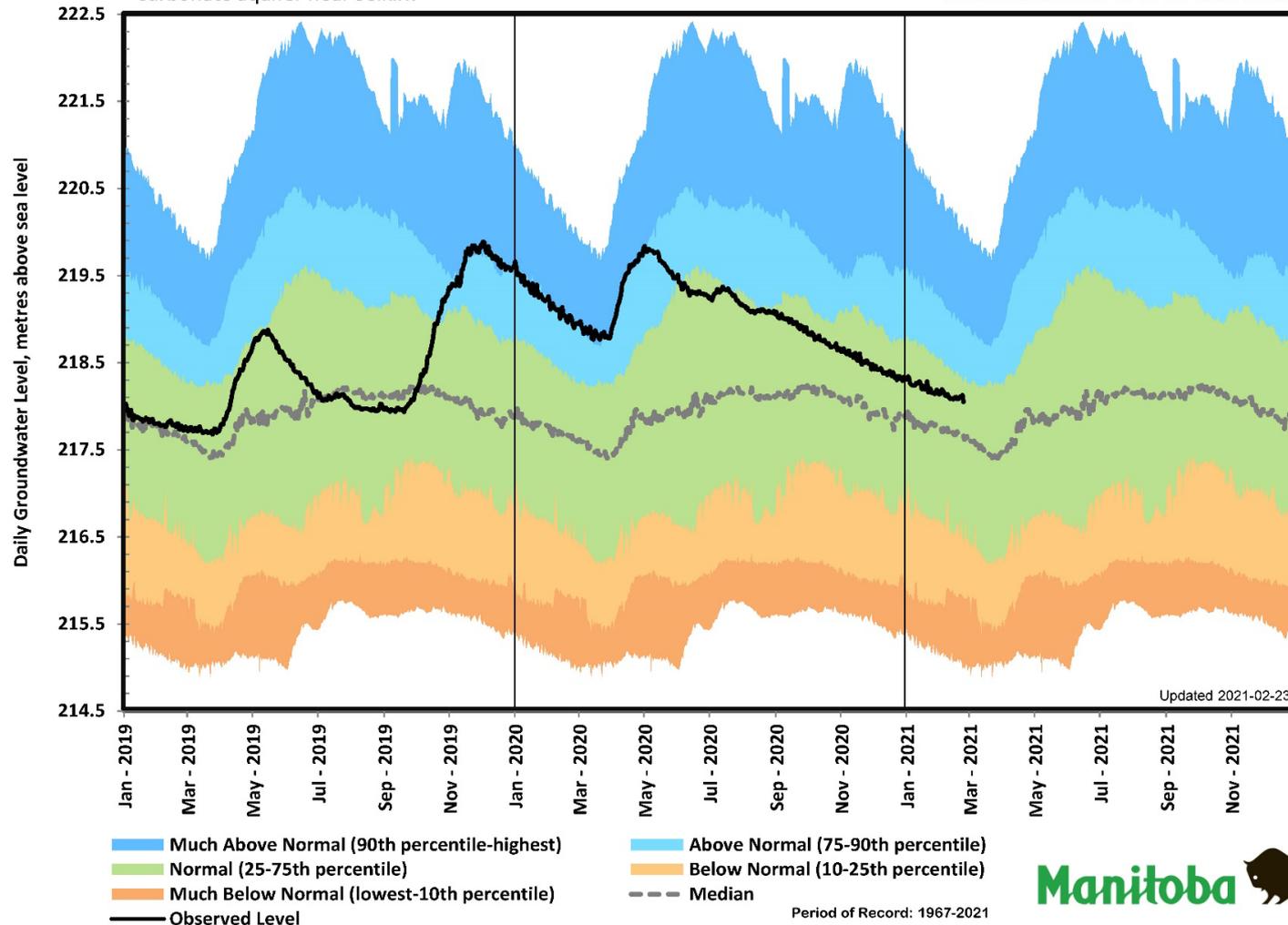


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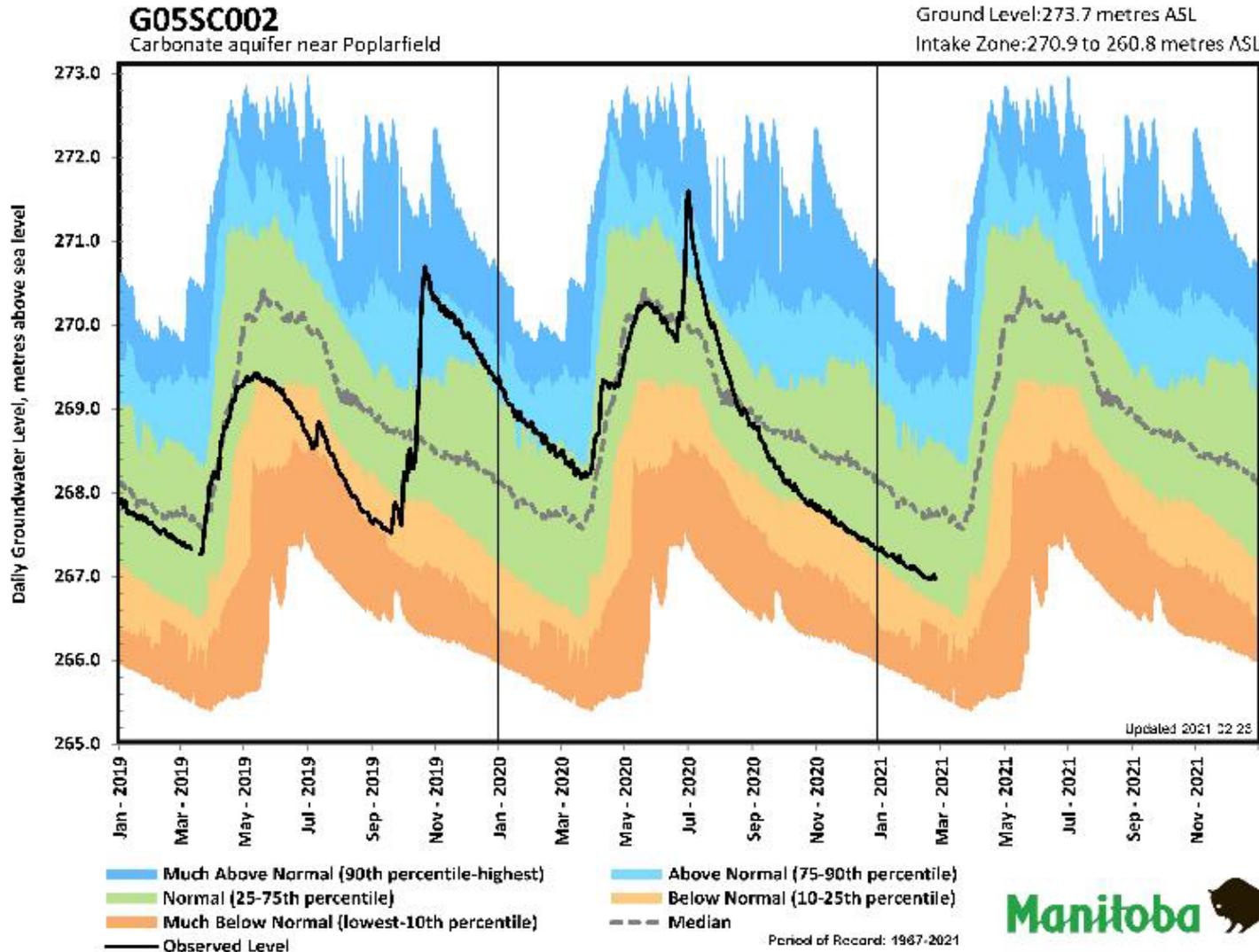
Carbonate aquifer near Selkirk

Ground Level: 229.3 metres ASL

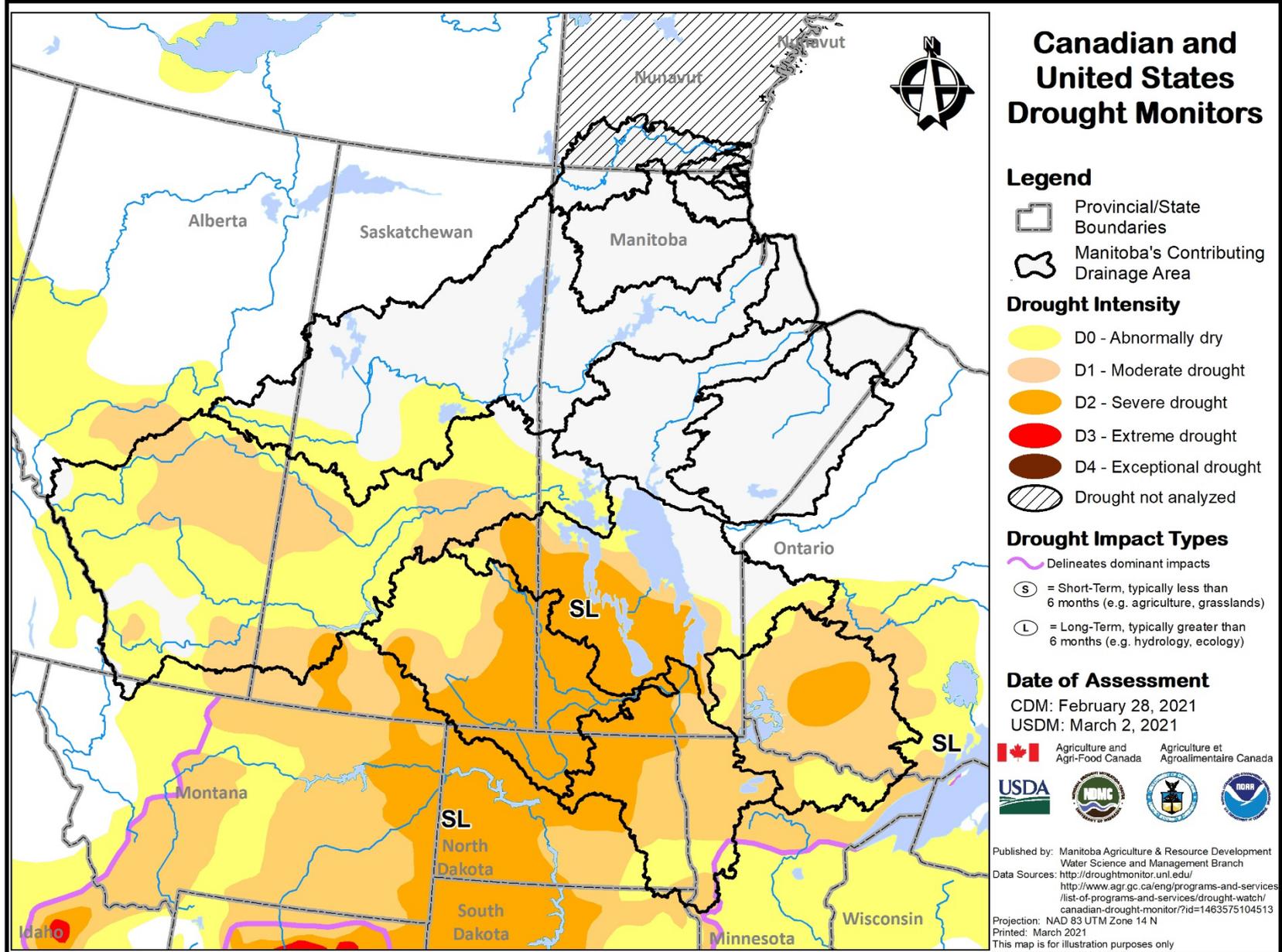
Intake Zone: 209.8 to 172.7 metres ASL



Carbonate Aquifer near Poplarfield



Canada/U.S. Drought Monitors



What does this all mean?

- While there are no current drought impacts, Manitoba is closely monitoring conditions and increasing its drought readiness.
- Droughts are difficult to forecast. A late snowstorm or spring rains will reduce the risk of impacts.
- If dry conditions persist, impacts are expected to begin after the spring freshet
 - Potential spring impacts include germination issues, increased number and severity of wildfires/grassfires, lack of water for filling dugouts and irrigation reservoirs, and low hay production
- If severe drought conditions persist through summer, longer term impacts could occur to water supplies for municipalities and other water users, along with reductions in hydroelectric production

INFORMATION SOURCES

Where to find more information?

- Manitoba Agriculture and Resource Development:
 - MB Drought Monitor
 - E-mail Carly.Delavau@gov.mb.ca to get monthly reports
 - Ag. Weather Program
 - Crop Reports, hay listing service, BMP programming
- Manitoba Infrastructure:
 - Hydrologic Forecast Centre
 - EMO
- Manitoba Conservation and Climate:
 - Wildfire Program

Where to find more information?

- Agriculture and Agri-food Canada
 - Drought Watch, including the Canadian Drought Monitor
- Water Survey of Canada
 - Water level and flow data
- Environment and Climate Change Canada
 - Historical climate data, weather forecasts
- United States Drought Monitor

THANK YOU! QUESTIONS?

www.gov.mb.ca/drought

Contact information:

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