

WATER AVAILABILITY AND DROUGHT CONDITIONS REPORT

December 31, 2008

Synopsis/Overview

Drought Condition Levels

The Palmer Drought and Standard Precipitation Indices (prepared by Agriculture and Agri-food Canada for the North American Drought Monitoring Program) indicate that there is an abnormally dry situation in the areas between The Pas and Swan River and a portion of southwest Manitoba near Melita. Drought severity increases as the Palmer Drought and Standard Precipitation Indices decline to more negative values (**Attachment 1**).

Precipitation

Average to above average precipitation (mostly in the form of snow) was received over the last 30 and 90 days in most areas with the exception of Melita, Swan River, Thompson, Gilliam and Churchill where precipitation was below average for the month of December (**Attachment 2**). However, caution is required when interpreting precipitation in the form of snow since climatic stations are sporadic. Additional information will become available later in the winter of 2009 after snow surveys are conducted.

Flows

Flows were average and above average for the entire province for the month of December (http://www.gov.mb.ca/waterstewardship/floodinfo/forecasts/river_report2008-18-12.html).

On-Farm Water Supply

On-farm surface water supplies continue to remain very low in southwestern Manitoba due to a lack of water sources from which to pump water during spring and fall of 2008. However, some farmers in southwestern Manitoba are allowing cattle to lick snow as their water supply rather than hauling.

Reservoirs

Most reservoirs operated by the province are full and have plenty of water to last until spring runoff 2009. An exception is Deloraine Reservoir which has relatively low water levels at five feet below full supply level.

Aquifers

Water levels in most aquifers are currently at or close to average levels for this time of year. Water level responses to seasonal or yearly precipitation fluctuations in most aquifers lag considerably behind surface water responses, so even prolonged periods of below normal precipitation may not have a significant deleterious effect on groundwater levels. Most aquifers also retain very large amounts of groundwater in storage and can

continue to provide water during extended periods of dry weather. Consequently, the major concern regarding groundwater and dry periods relates to shallow sand aquifers and large-diameter wells constructed into these aquifers. Many of these areas are serviced by water supply pipelines.

Soil Moisture

Manitoba Agriculture, Food and Rural Initiatives reports that fall moisture in the root Zone (0-120cm) was more than 60 % of the available water holding capacity in most areas of Manitoba. Less than 60 % of the available water holding capacity was found in the Melita, Hamiota, Carberry, Woodlands and Swan River areas. Soil moisture in the top layer (0-30cm) was less than 50 % of available water holding capacity in Morden, Winkler, Woodland, Teulon, Russell, Swan River and Ashern areas (**Attachment 3**).

The State of the Canadian Cryosphere maps show that the snow water equivalent for December is less than 20mm for most areas except in the Red River basin near the United States Border (**Attachment 4**).

Environment Canada's 3 Month Outlook (January-February-March 2009)

The three month Environment Canada forecast is for **below normal temperature** for the entire province with **above normal precipitation** for southern and central Manitoba and **normal** for the far north (**Attachment 5**).

Detail by Manitoba Water Stewardship Region (Attachment 6)					
Water Stewardship Region	Indicators				
	1 month Precipitation (December 2008)	3 month Precipitation (October to December 2008)	Flow Conditions (December 2008)	Palmer Drought Index (PDI) (December 2008)	Standard Precipitation Index (SPI) (December 2008)
Red River	Average to above average	Average to above average	Above average	Moderately wet	Moderately wet
Interlake	Average to above average, except below average for the area from Gimli to Fisher River	Average to above average	Average to above average	Moderately wet	Moderately wet
Western	Average to above average, except below average for Melita and Swan River	Average to above average, except below average for Melita, Brandon and Swan River	Average	Moderately wet, except mild drought near Melita and Swan River	Moderately wet, except mild drought near Melita and Swan River
Eastern	Average to above average	Average to above average	Average	Moderately wet	Moderately wet
Northwest	Below average for the area of The Pas	below average for the area of The Pas	Average	Mild drought near The Pas	Mild drought near The Pas
Northeast	Below average for the area of Thompson, Gillam and Churchill	Below average for the areas of Thompson, Gillam and Churchill	Average to above average	N/A	N/A

Guidelines to Deal with Drought and Water Supply Shortages

In 2008, Manitoba Water Stewardship initiated the production of routine inter-agency water supply/drought condition reports (Ecological Services Division and Regulatory and Operational Services Division, Manitoba Water Stewardship). An inter-agency drought committee was also established and includes Manitoba Agriculture, Food and Rural Initiatives, the Emergency Measures Organization, Conservation, Water Stewardship, Infrastructure and Transportation as well as federal agencies such as Prairie Farm Rehabilitation Administration (PFRA).

In the event of a drought, the following can be quickly implemented:

- Operate dams to supply downstream water needs while conserving reservoir water as much as possible for later use (Regulatory and Operational Services Division, Water Stewardship).
- Continue providing pumps for farmers to fill dugouts from ditches or other temporary water sources following rainfall (Manitoba Conservation Districts).
- Advise as to sources of reliable water for water hauling (Manitoba Water Services Board).

If drought conditions worsen, the inter-agency drought committee will provide advice on:

- Voluntary curtailment of non-essential uses;
- Possible difficulties such as the need to lower intakes (based on river and reservoir forecasts);
- The need to secure rural water supplies by deepening pump intakes; and
- Water use efficiency and water conservation.

Drought Condition

There are several levels of drought depending on the length of the dry period and the time of year. Drought pertaining to crops and forest fires can develop quite quickly following a period of below average precipitation. Surface water drought with respect to farm dugouts can occur quickly during the spring if there is little or no runoff. A more general surface water drought with low reservoir and low river levels tends to develop after a somewhat longer period of dry weather of a few seasons. Groundwater drought is the last to develop and may require many years of dry weather to develop

Related Web Resources for Maps and Analyzed data

This report would not be possible without the resources produced by the following agencies:

- Agriculture and Agri-food Canada, http://www.agr.gc.ca/pfra/drought/mapscc_e.htm
 - Regional site: [30 and 90 precipitation](#)
 - National Site: [Palmer Drought](#) and [Standard Precipitation Indices](#)
- Manitoba Water Stewardship: Flow information: http://www.gov.mb.ca/waterstewardship/floodinfo/forecasts/river_report2008-18-

[12.html](#).)

- Fire Hazard: <http://www.gov.mb.ca/conservation/fire/>
- Environment Canada 3 month climatic outlook: http://www.weatheroffice.gc.ca/saisons/index_e.html
- North America Drought Monitor: http://www.agr.gc.ca/pfra/drought/mapscc_e.htm; http://www.agr.gc.ca/pfra/drought/pr_e.htm
- State of the Canadian Cryosphere: http://www.socc.ca/snow/snow_current_e.cfm

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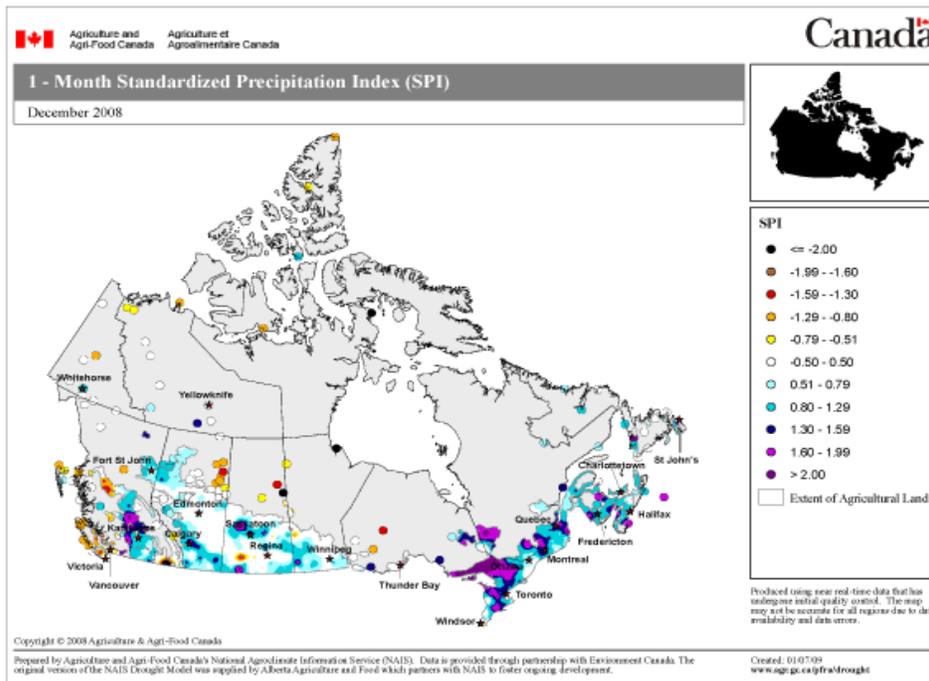
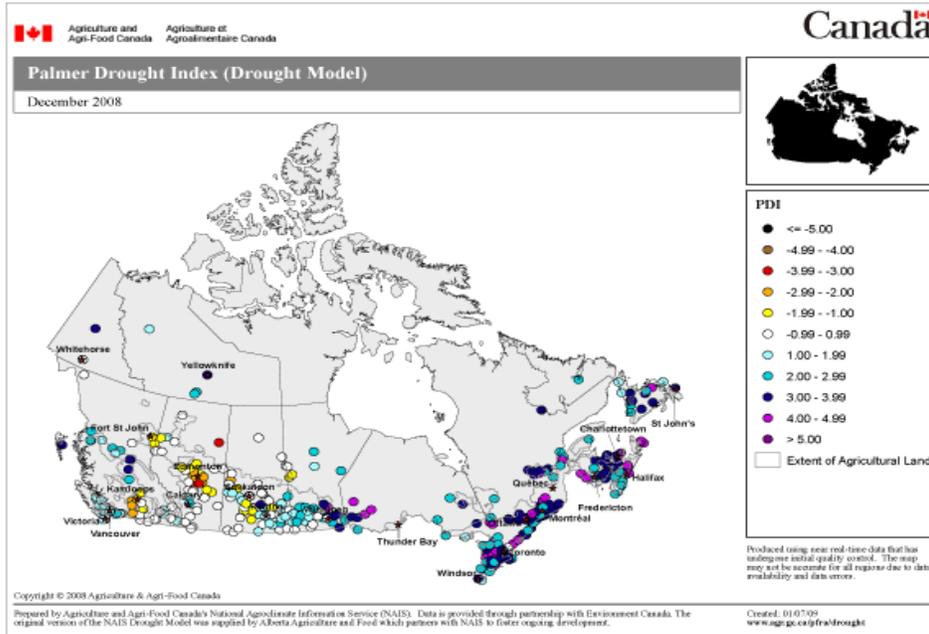
Bob Betcher, Groundwater Management, 945-7420

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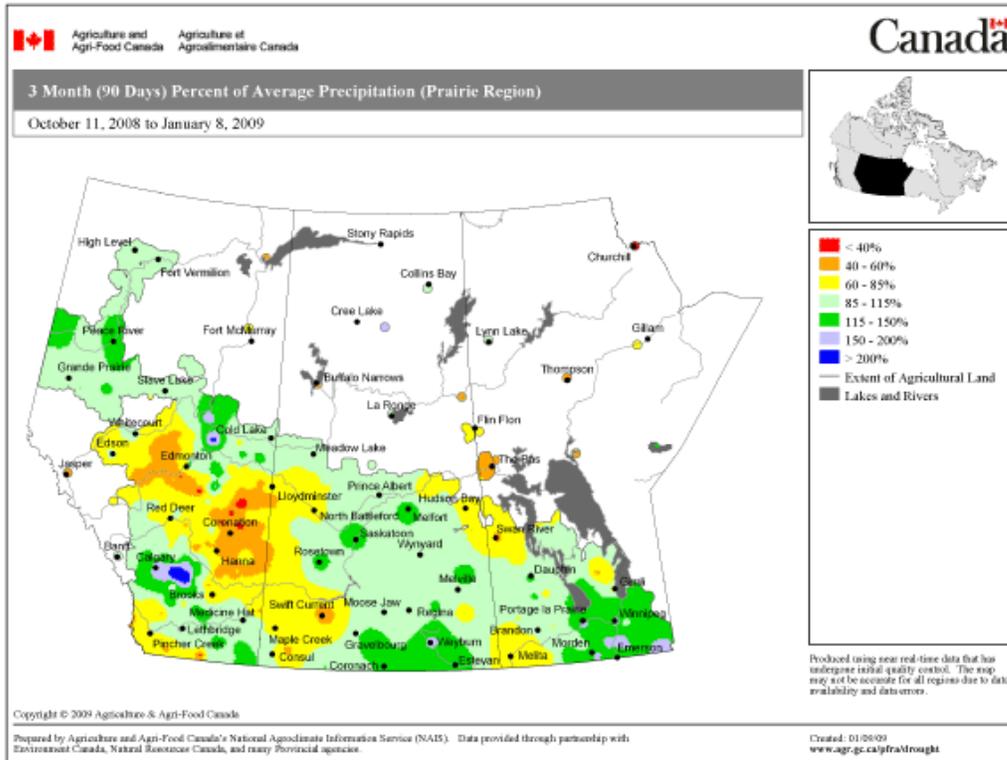
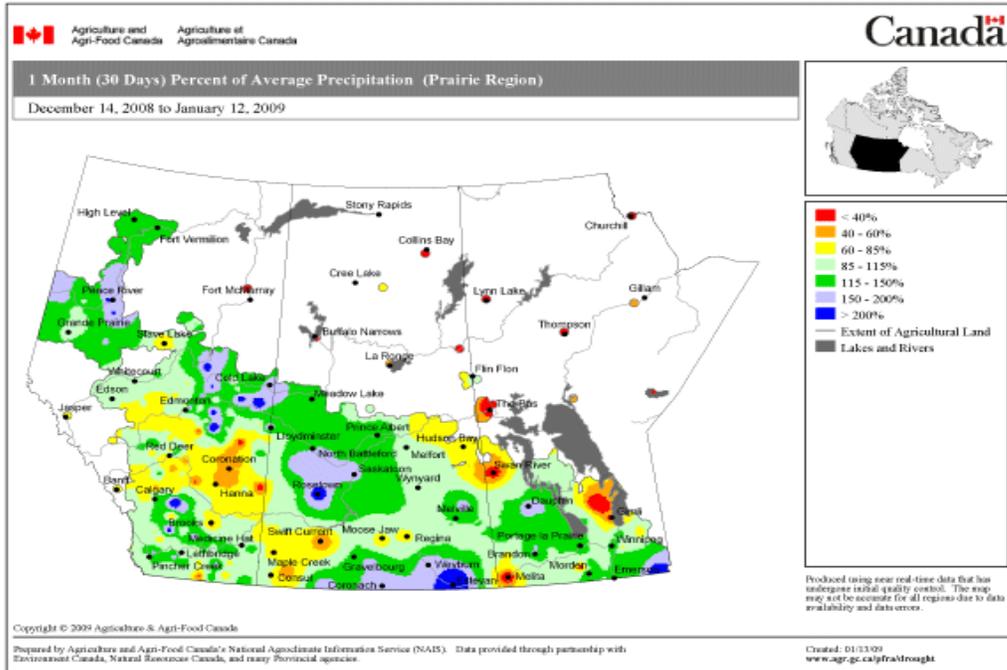
Rob Matthews, Water Use Licensing, 945-6118

Attachments

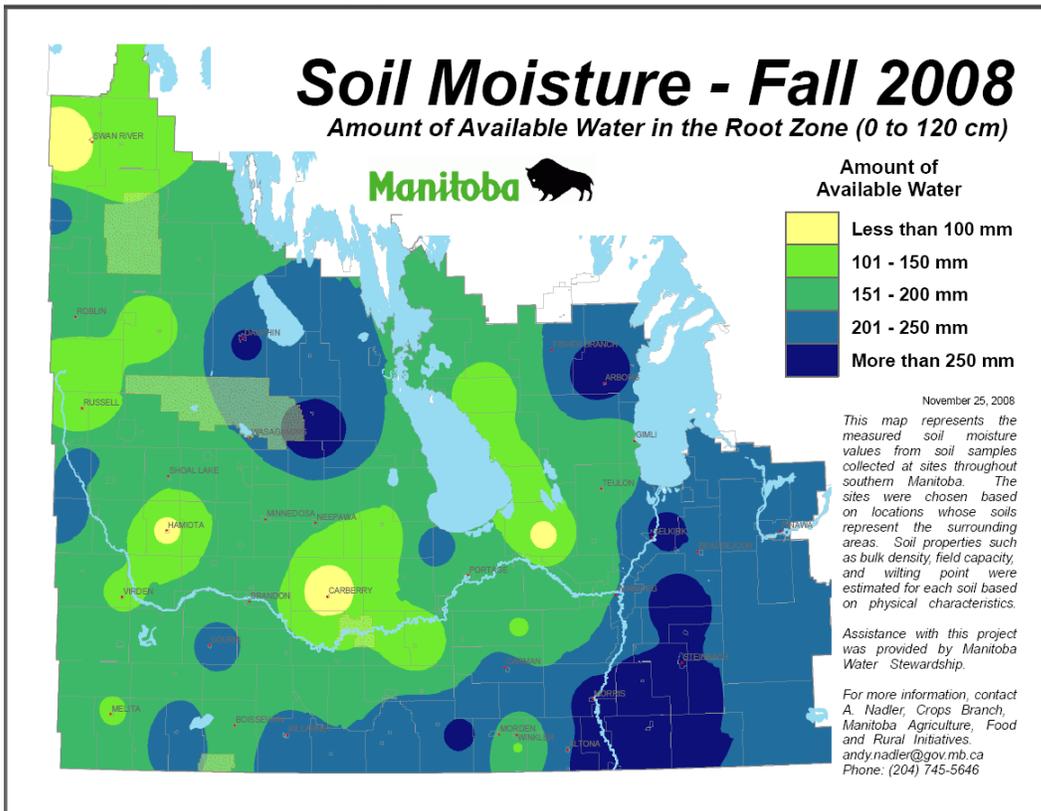
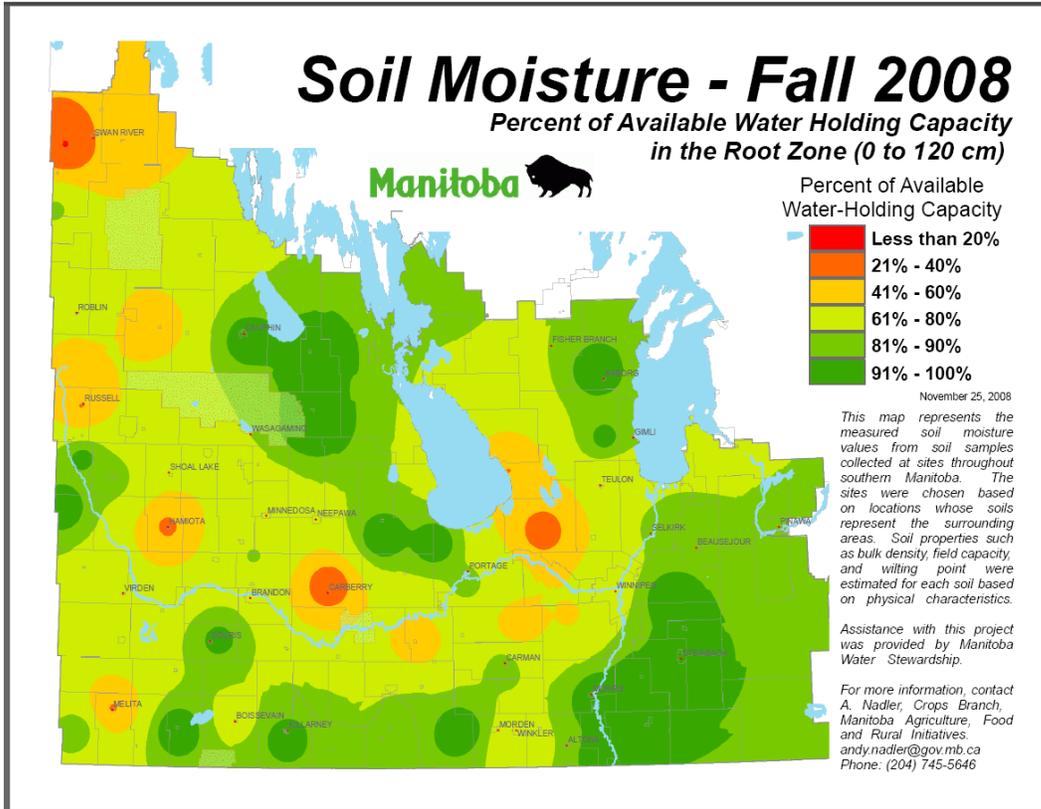
1. Palmer Drought and Standard Precipitation Indices



2. Precipitation (30 days and 90 days)



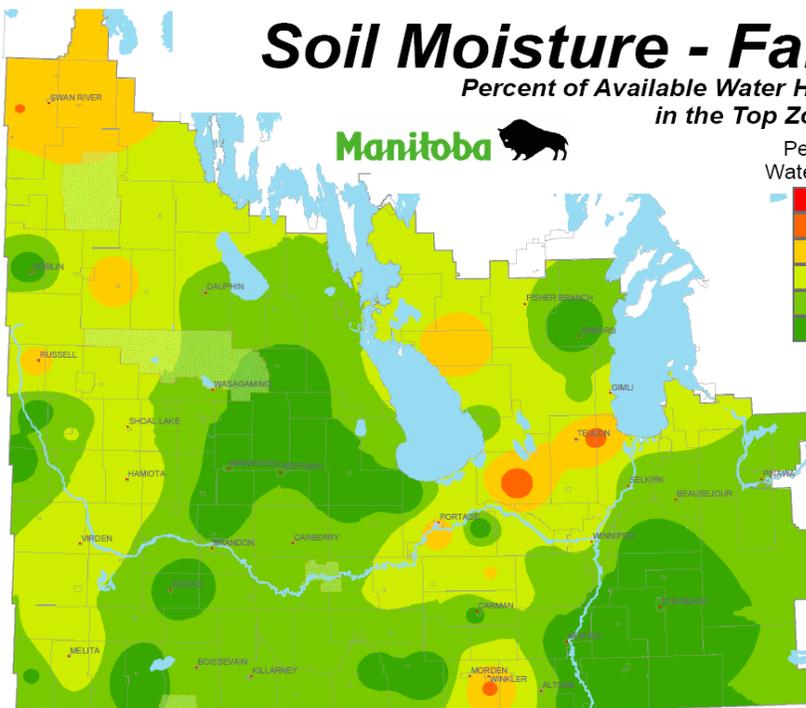
3. Soil Moisture



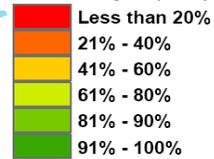
Soil Moisture - Fall 2008

Percent of Available Water Holding Capacity
in the Top Zone (0 to 30 cm)

Manitoba 



Percent of Available
Water-Holding Capacity



November 25, 2008

This map represents the measured soil moisture values from soil samples collected at sites throughout southern Manitoba. The sites were chosen based on locations whose soils represent the surrounding areas. Soil properties such as bulk density, field capacity, and wilting point were estimated for each soil based on physical characteristics.

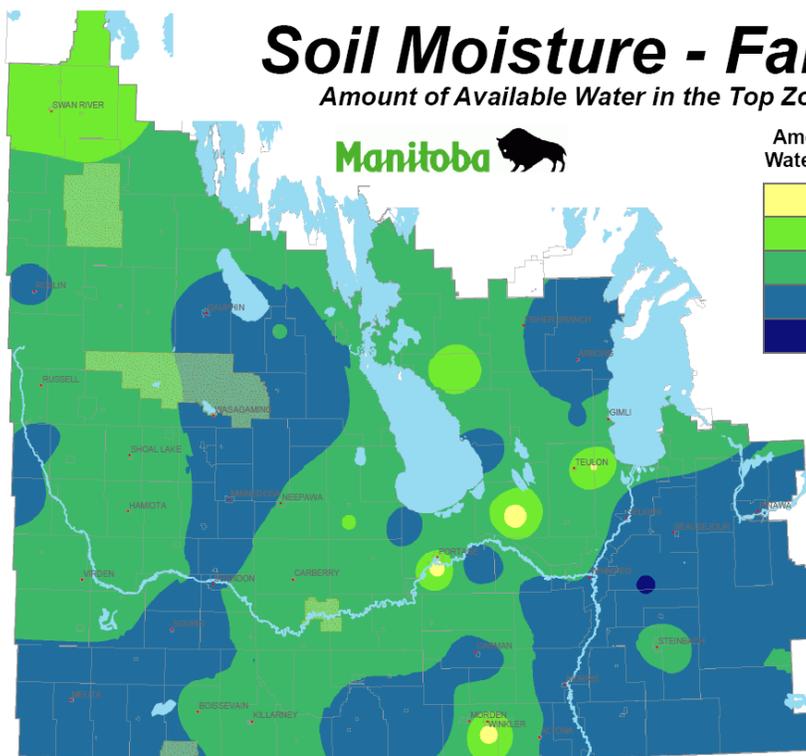
Assistance with this project was provided by Manitoba Water Stewardship.

For more information, contact A. Nadler, Crops Branch, Manitoba Agriculture, Food and Rural Initiatives. andy.nadler@gov.mb.ca Phone: (204) 745-5646

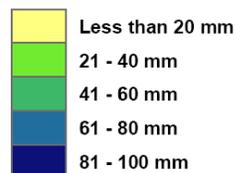
Soil Moisture - Fall 2008

Amount of Available Water in the Top Zone (0 to 30 cm)

Manitoba 



Amount of Available
Water in the Top Zone



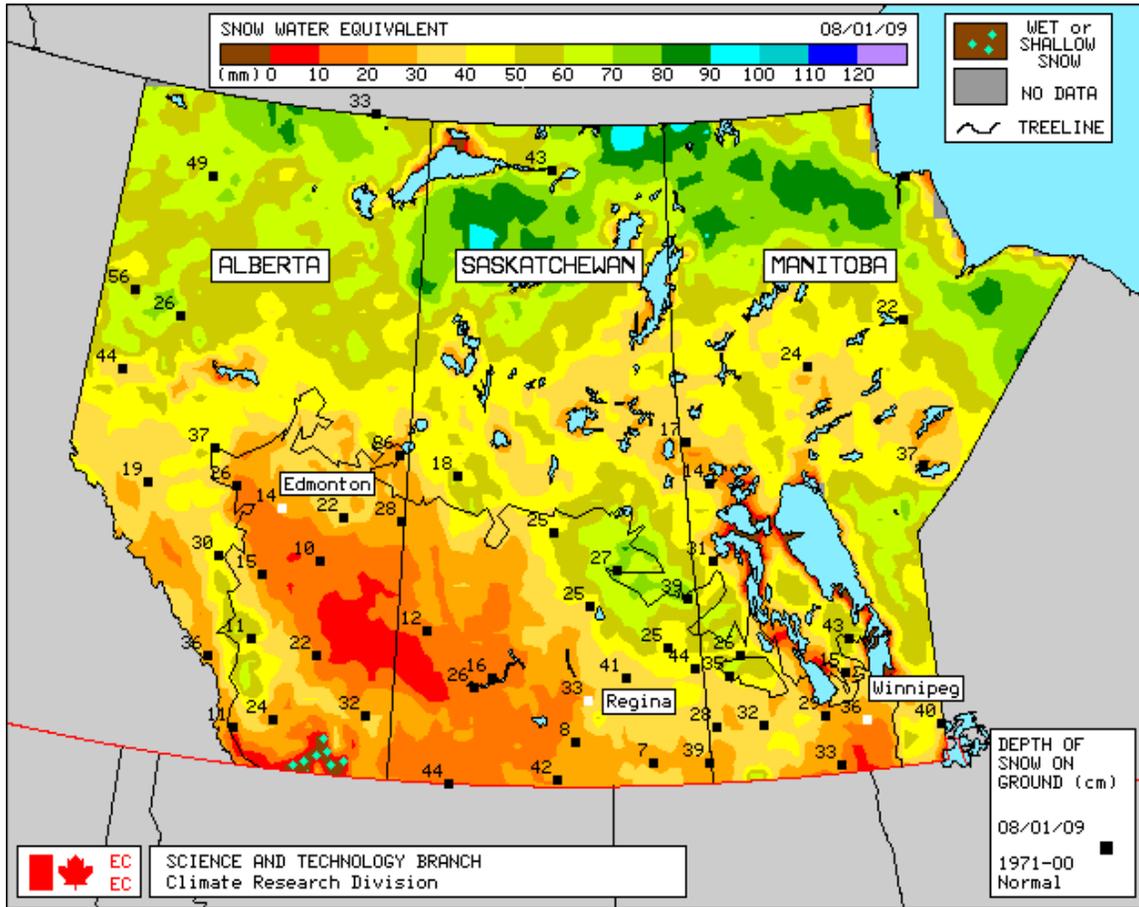
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4. Snow Water Equivalent



5. Environment Canada 3 Month Outlook

