

**WATER AVAILABILITY AND DROUGHT CONDITIONS REPORT
Manitoba**

August 16, 2013

Synopsis/Overview

This Water Availability and Drought Conditions Report provides an update on meteorological and hydrologic conditions for Manitoba as of July 2013.

The three month precipitation indicator indicates moderately dry conditions prevailed in the areas around Thompson, Island Lake and Tadoule Lake. Severely dry conditions prevailed in the areas around Norway House and Lynn Lake. Extremely dry conditions prevailed in the area around Gillam.

Overall, flow indicators indicated flows were normal for most rivers across the province. Moderately dry hydrological conditions prevailed in the Taylor River near Thompson and the Hayes River near below Gods River. Severely dry hydrological conditions prevailed in the Kettle River near Gillam.

Manitoba Agriculture, Food and Rural Initiatives reports that water levels in dugouts were full or close to full in all regions of Agri-Manitoba.

Water supply reservoirs in southern and western Manitoba are at full supply levels.

Outlook

Environment Canada's seasonal forecast for the next three months (August, September and October 2013) is for normal temperatures for the entire province except above normal for the far north and areas along Hudson Bay shoreline. Normal precipitation is forecast for the entire province (Attachment 4).

Indicators

Two types of indicators are assessed across Manitoba - precipitation and stream flow. The indicators describe the severity of dryness in a watershed.

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 the long term (twelve months), medium term (three months) and short term (one month). Long term and medium term indicators provide the most appropriate assessment of dryness as the short-term indicator is influenced by significant rainfall events and spatial variability in rainfall, particularly during summer storms.

The stream flow indicator is used to determine the severity of hydrological dryness in a watershed.

Precipitation

Precipitation indicators are summarized by basin in Table 1 and on maps in Attachment 1.

Over the long term (twelve months), conditions were normal throughout the province with the exception of the areas near Gimli, Lynn Lake, Tadoule Lake and Churchill which have experienced moderately dry conditions. Norway House has experienced severely dry conditions.

Over the medium term (three months), moderately dry conditions prevailed in the areas around Thompson, Island Lake and Tadoule Lake. Severely dry conditions prevailed in the areas around Norway House and Lynn Lake. Extremely dry conditions prevailed in the areas around Gillam.

Over the short term (one month), moderately dry conditions prevailed in the areas around Brandon, Island Lake, Gillam, and Tadoule Lake. Severely dry conditions prevailed in the areas around Grand Rapids. Extremely dry conditions prevailed in the areas around Norway House.

Stream Flows

Stream flow indicators are summarized by basin in Table 1 and on a map in Attachment 2. Monthly flow indicator indicates flows for July were normal or greater than normal for most rivers across the province. Moderately dry hydrological conditions prevailed in the Taylor river near Thompson and the Hayes River near below Gods River. Severely dry hydrological conditions prevailed in the Kettle River near Gillam.

Water Availability

Reservoir Conditions

Water supply reservoirs in southern and western Manitoba are at full supply levels (Attachment 3).

On Farm Water Supply

Manitoba Agriculture, Food and Rural Initiatives reports that water levels in dugouts were full or close to full in all regions of Agri-Manitoba.

Aquifers

Groundwater levels in major aquifers are generally good. 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 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'.

Forest and Grassland Fires

The Provincial Fire Program reported that there are currently no fires of concern in Manitoba and the overall fire hazard is low province wide. More detailed information on fire conditions is available on the Manitoba Conservation and Water Stewardship website under the Fire Program (website <http://www.gov.mb.ca/conservation/fire/>).

Potential Impacts

Most areas in northern Manitoba received below normal precipitation over the last three months and are experiencing moderately to extremely dry conditions. Northeastern rivers are also experiencing moderately dry hydrological conditions. With Environment Canada's outlook for the next three months for above normal temperature and normal precipitation for the far north and areas along Hudson Bay shoreline, there is a risk for continued dry conditions for the far north and northeastern Manitoba. Provincial water supply reservoirs should have sufficient water supplies for the balance of the year.

Table 1: Drought Indicators by Major River Basin (Attachments: 1, 2 and 5)

Basin (in Manitoba)	Drought Indicators			
	Monthly Precipitation Indicator (Percent of 1 month Median) July 2013	Monthly Precipitation Indicator (Percent of 3 month Median) (May - July 2013)	Monthly Precipitation Indicator (Percent of 12 month Median) (August 2012- July 2013)	Monthly Flow Percentile July 2013 (Lowest 10 th -20 th -35 th)
Red River	Normal	Normal	Normal	Normal
Winnipeg River	Normal	Normal	Normal	Normal
Assiniboine River-Souris River	Normal except moderately dry for Brandon	Normal	Normal	Normal
Lake Manitoba	Normal	Normal	Normal	Normal
Lake Winnipeg	Normal	Normal	Normal except moderately dry for Gimli	Normal
Saskatchewan River	Normal except severely dry for Grand Rapids	Normal	Normal	Normal
Nelson River	Moderately to extremely dry except normal for Thompson	Moderately to extremely dry	Normal except severely dry for Norway House	Normal except moderately dry for the Taylor River near Thompson and severely dry for the Kettle River near Gillam
Hayes River	Moderately dry	Moderately dry	Normal	Moderately dry
Churchill River	Normal	Severely dry for Lynn Lake	Moderately dry	Normal
Seal River	Moderately dry	Moderately dry	Moderately dry	Normal

Acknowledgements

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

- Manitoba Infrastructure and Transportation: Flow and Lake information:
http://www.gov.mb.ca/mit/floodinfo/floodoutlook/river_conditions.html
http://www.gov.mb.ca/mit/floodinfo/floodoutlook/lakes_information.html
- Environment Canada: Flow and Lake information
http://www.wateroffice.ec.gc.ca/index_e.html
- Fire Hazard: <http://www.gov.mb.ca/conservation/fire/>
- Environment Canada 3 month climatic outlook:
http://weatheroffice.gc.ca/saisons/index_e.html
- Manitoba Agriculture, Food and Rural Initiatives:
<http://www.gov.mb.ca/agriculture/crops/seasonal-reports/crop-report-archive/index.html>
- Manitoba Conservation and Water Stewardship Fire Program

For further information, please contact: Abul Kashem, Surface Water Management Section, Manitoba Conservation and Water Stewardship, 204-945-6397/204-803-9431.

Definition of drought

Meteorological Drought is 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. Meteorological droughts only consider the reduction in rainfall amounts and do not take into account the effects of the lack of water on water reservoirs, human needs or on agriculture. A meteorological drought can occur without immediately impacting streamflow, groundwater, or human needs. If a meteorological drought continues, it will eventually begin to affect other water resources.

Agricultural Drought occurs when there is not enough water available for a particular crop to grow at a particular time. Agricultural drought depends not only on the amount of rainfall but also on the use of that water. Agricultural droughts are typically detected after meteorological drought but before a hydrological drought. If agricultural drought continues, plants will begin to protect themselves by reducing their water use, which can potentially reduce crop yields.

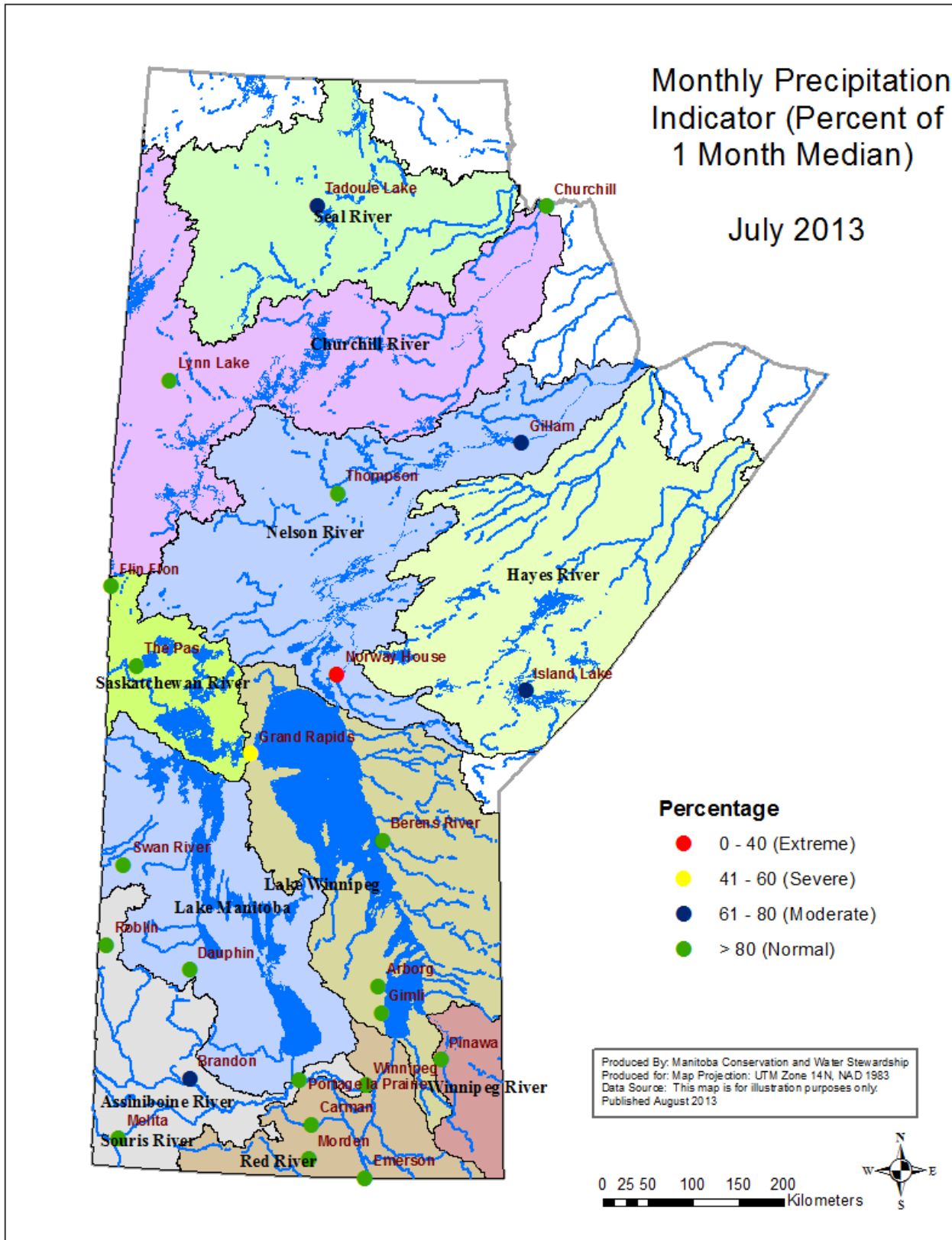
Hydrological Drought is associated with the effect of low rainfall on water levels in rivers, reservoirs, lakes, and aquifers. Hydrological droughts are usually noticed some time after meteorological droughts. First, precipitation decreases and after some time, water levels in rivers and lakes drop. Hydrological drought affects uses that depend on water levels. Changes in water levels affect ecosystems, hydroelectric power generation, and recreational, industrial and urban water use. A minor drought may affect small streams causing low streamflows or drying. A major drought could impact surface storage, lakes, and reservoirs thereby affecting water quality and causing municipal and agricultural water supply problems.

Rainfall also recharges groundwater aquifers through infiltration through the soil and run-off into streams and rivers. Once groundwater and surface waters are significantly impacted by lack of precipitation, a "hydrologic drought" occurs. Aquifer declines can range from a quick response (shallow sand) to impacts extending over multiple years. Impacts can include depletion of shallow depth wells, drying of farm dugouts, and changes to ground water quality.

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. At any time during meteorological, hydrological, or agricultural droughts, a socioeconomic drought can occur.

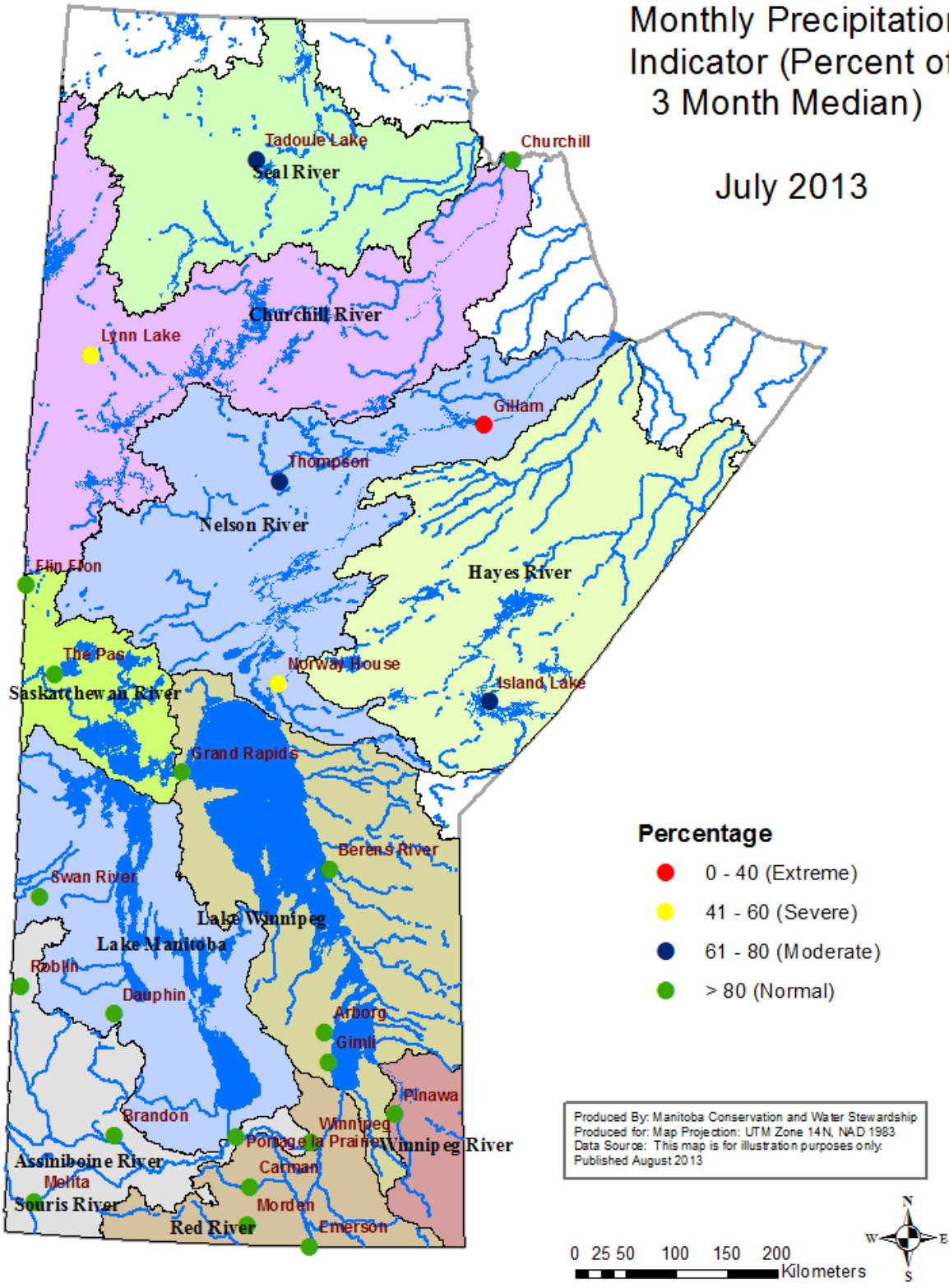
Attachments

1. Precipitation Indicator (Percent of 1, 3 and 12 month median precipitation)



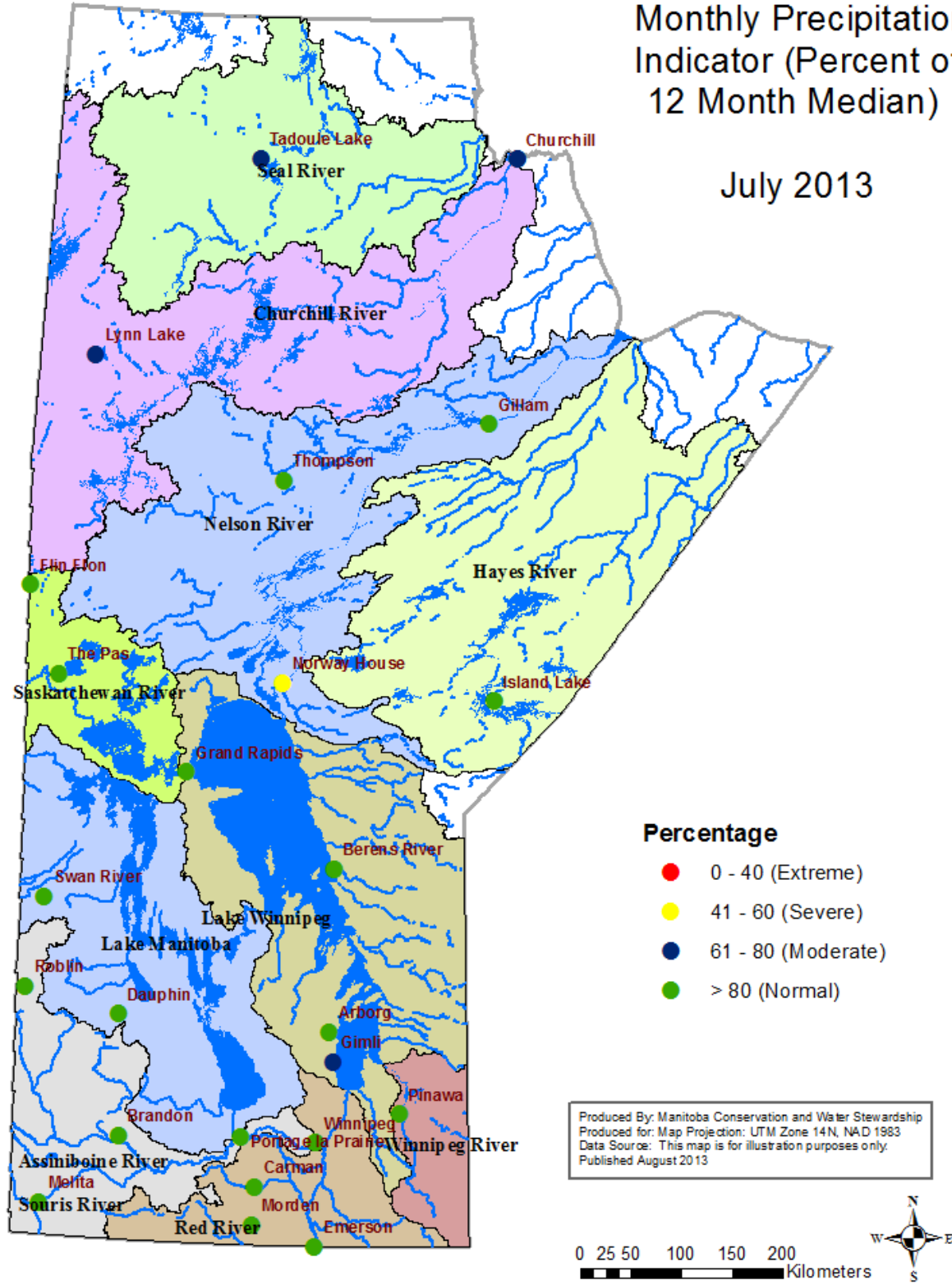
Monthly Precipitation Indicator (Percent of 3 Month Median)

July 2013

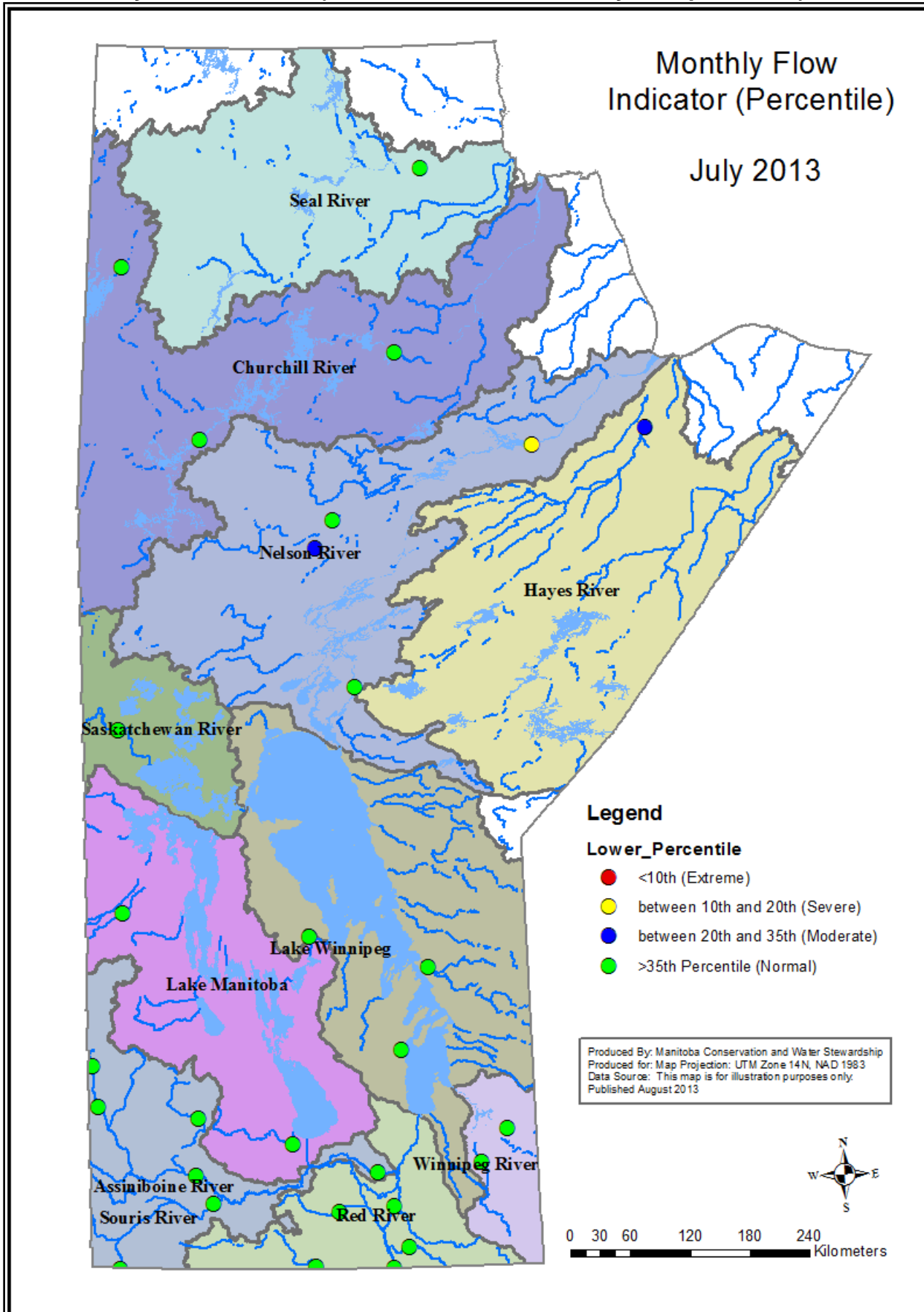


Monthly Precipitation Indicator (Percent of 12 Month Median)

July 2013



2. Monthly Flow Indicator (lower 10th-20th-35th monthly flow percentile)

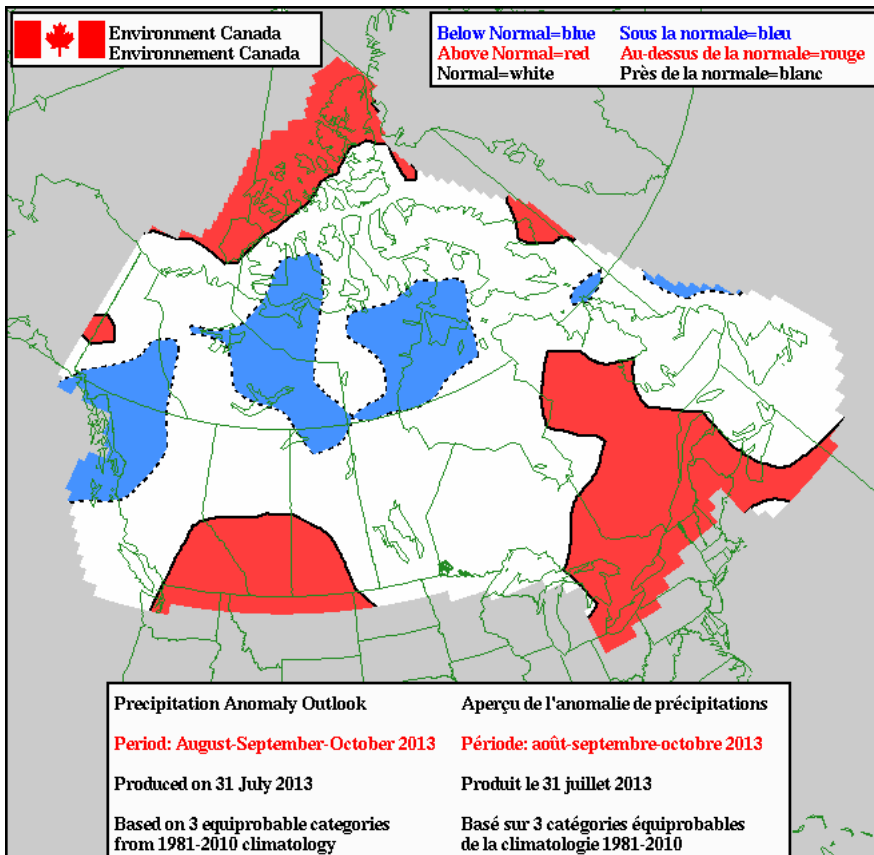
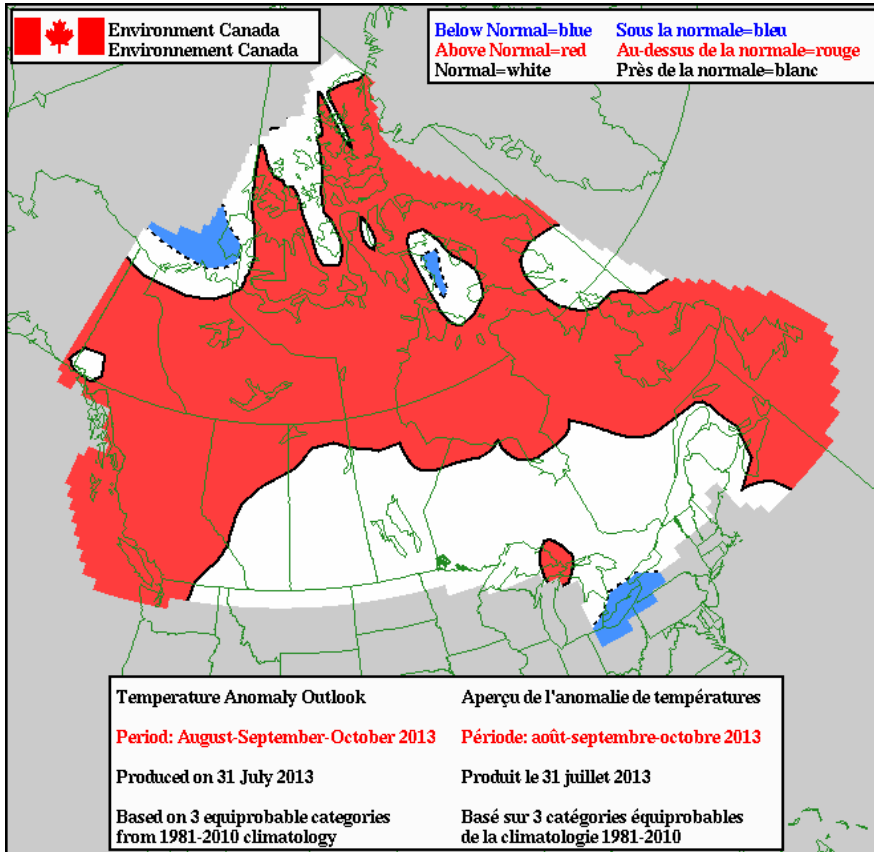


3. Water Supply Reservoir Status (Southern and Western)

Water Supply Reservoir Levels and Storages								
August 14, 2013								
Lake or Reservoir	Community	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) (%)
Elgin	Elgin	1532.00	1532.76	May 28, 2013	0.8	520	573	110%
Goudney (Pilot Mound)	Pilot Mound	1482.00	1482.37	June 11, 2013	0.4	450	468	104%
Lake of the Prairies (Shellmouth)*	Brandon, Portage	1402.50	1405.24	August 14, 2013	2.7	300,000	339,033	113%
Manitou (Mary Jane)	Manitou	1537.00	1537.11	June 11, 2013	0.1	1,150	1,153	100%
Minnewasta (Morden)	Morden	1082.00	1081.39	August 14, 2013	-0.6	3,040	3,047	100%
Rapid City	Rapid City	1573.50	1573.50	May 29, 2013	0.0	200	200	100%
Lake Wahtopanah (Rivers)	Rivers	1536.00	1536.79	August 14, 2013		24,500	26,273	107%
Stephenfield	Carman	972.00	971.75	August 14, 2013	-0.3	3,810	3,692	97%
Turtlehead (Deloraine)	Deloraine	1772.00	1771.93	July 10, 2013	-0.1	1,400	1,396	100%
Vermilion	Dauphin	1274.00	1274.69	August 5, 2013	0.7	2,600	2,620	101%

* Summer Target level and storage.

4. Environment Canada 3 Month Outlook



5. Major River Basin

