

**WATER AVAILABILITY AND DROUGHT CONDITIONS REPORT
Manitoba**

September 27, 2012

Synopsis/Overview

Due to lack of precipitation over the last three months, moderately dry conditions prevailed in the Assiniboine and Seal River Basins and in the Dauphin area. Areas near Emerson, Carman, Portage la Prairie and Norway House were severely dry. Areas around Winnipeg and Morden approached extremely dry conditions.

Due to low streamflow, the Pembina, Boyne, Souris (near Wawanesa), and Red (near St. Agathe) rivers and in the Seal River in northern Manitoba experienced moderately dry hydrological conditions. Severely dry hydrological conditions prevailed in the Whitemud River and in the Taylor River in the Nelson River watershed. Extremely dry hydrological conditions prevailed in the Roseau, Whitemouth and Icelandic River watersheds.

A number of lakes in southeastern Manitoba are experiencing low water levels including Big Whiteshell, Falcon and West Hawk lakes.

Most water supply reservoirs in southern and western Manitoba are at full or near full supply levels except for the Stephenfield and Minneswasta (Morden) reservoirs where storage is declining and the reservoirs are at 70 % and 83 % of their full storage capacity. Reservoirs have sufficient water supplies for the balance of the year.

Manitoba Agriculture, Food and Rural Initiatives reports that water levels in dugouts were lower than normal in the Southwest, Central, Interlake and Eastern regions with dugout water supplies continuing to decline. Some producers are exploring pumping water and installing pasture pipelines. Pasture productivity has been negatively affected by hot and dry conditions in most regions and pasture production is of concern.

Outlook

Environment Canada's seasonal forecast for the next three months (September, October and November 2012) for Manitoba is for above normal temperatures and normal precipitation for the entire province except below normal precipitation for much of northern Manitoba (Attachment 4).

Indicators

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

Precipitation is assessed to determine the severity of meteorological dryness in a watershed and is an indirect measurement of agricultural dryness. Three precipitation indicators are calculated to represent the long term (12 month), medium term (3 months) and short term (1 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 flow indicator is used to determine the severity of hydrological dryness in a watershed.

Precipitation

Over the long term (12 month precipitation indicator), conditions are normal throughout the province with the exception of the areas near Emerson, Carman, Melita, Grand Rapids, Tadoule Lake and Norway House which have been experiencing moderately dry conditions.

Over the medium term (3 month precipitation indicator), moderately dry conditions prevailed in much of the Winnipeg River, Red River, Assiniboine River and Seal River basins and in the Dauphin area. Severely dry conditions prevailed near Emerson, Carman, Portage la Prairie, Grand Rapids and Norway House. Extremely dry conditions prevailed in the Winnipeg and Morden areas (Table 1 and Attachment 1).

Over the short term (1 month precipitation indicator), normal conditions prevailed over much of northern Manitoba. However, severely dry conditions prevailed in the Saskatchewan River basin and the Norway House area. Extremely dry conditions prevailed across all of southern Manitoba except in the Berens River area.

Stream and River Flows

The flow percentile indicator indicates moderately dry hydrological conditions in the Pembina, Boyne, Souris (near Wawanessa), and Red (near St. Agathe) rivers and in the Seal River in northern Manitoba. Severely dry hydrological conditions prevailed in the Whitemud River and in the Taylor River in the Nelson River watershed. Extremely dry hydrological conditions were observed in the Roseau, Whitemouth and Icelandic River watersheds (Table 1 and Attachment 2).

Water Availability

Lake/Reservoir Conditions

A number of lakes in southeastern Manitoba are still experiencing low water levels due to prolonged dry conditions including Big Whiteshell, Falcon and West Hawk lakes. (http://www.gov.mb.ca/mit/floodinfo/floodoutlook/lakes_information.html).

Most water supply reservoirs in southern and western Manitoba are at full or near full supply levels except for Stephenfield and Minneswasta (Morden) reservoirs where storage is 70 % and 83 % of the full storage levels (Attachment 3).

On Farm Water Supply

Manitoba Agriculture, Food and Rural Initiatives reports that water levels in dugouts were lower than normal in the Southwest, Central, Interlake and Eastern regions. Dugout water supplies continue to decline. Some producers are exploring pumping water and installing pastures pipelines. Pasture productivity has been negatively affected by hot and dry conditions in most regions with pasture production of concern in most areas in the Southwest, Central, Interlake and Eastern regions.

Aquifers

Groundwater levels in 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 shallow sand aquifers and large-diameter wells constructed into these aquifers. Many of these areas are serviced by water supply pipelines.

Forest and Grassland Fires

Due to dry conditions, fires are still a concern for the province. More detailed information on fire conditions is available on the Manitoba Conservation and Water Stewardship under the Fire Program (website <http://www.gov.mb.ca/conservation/fire/>).

Potential Impacts

Southeastern rivers and tributaries are experiencing very low flow conditions with extremely dry hydrological conditions in the Whitemouth and Roseau Rivers along with the Icelandic River in the Interlake. Flows in the Red River are declining and moderately dry conditions are prevailing near St. Agathe. With Environment Canada's outlook for normal precipitation with above normal temperatures, there are concerns that the province could see prolonged low streamflow conditions in southeastern Manitoba including in the Red River valley. There is a risk of increased shortage of livestock water and pastures in Southeastern Manitoba.

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

Basin (in Manitoba)	Indicators			
	Percent of 1 month Median Precipitation September 2012	Percent of 3 month Median Precipitation (July - September, 2012)	Percent of 12 month Median Precipitation (October 2011- September 2012)	Monthly Flow Percentile September 2012 (Lower 10 th -20 th -35 th)
Red River	Extremely dry	Severely to extremely dry	Moderately to severely dry except normal for Winnipeg	Moderately to extremely dry except normal for Red River at Emerson.
Winnipeg River	Extremely dry	Moderately dry	Normal	Extremely dry for Whitemouth River and normal for the Winnipeg River
Assiniboine River-Souris River	Extremely dry	Moderately dry	Normal except moderately dry for Melita	Normal except moderately dry for Souris River at Wawanesa
Lake Manitoba	Extremely dry	Normal near Swan River and moderately dry for Dauphin	Normal	Normal except severely dry for Whitemud River
Lake Winnipeg	Extremely dry except normal for Berens River	Normal	Normal	Normal except extremely dry for Icelandic River
Saskatchewan River	Severely dry	Normal except severely dry for Grand Rapids	Normal except moderately dry for Grand Rapids	Normal
Nelson River	Normal except severely dry for Norway House	Normal except severely dry for Norway House	Normal except moderately dry for Norway House	Normal except severely dry for Taylor River near Thompson
Hayes River	Normal	Normal	Normal	Normal
Churchill River	Normal	Normal	Normal	Normal except moderately dry for Cochrane River Near Brochet
Seal River	Normal	Moderately dry	Moderately dry	Moderately dry

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/cropreports/pdf/cr.pdf>
- Manitoba Conservation and Water Stewardship Fire Program

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

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.

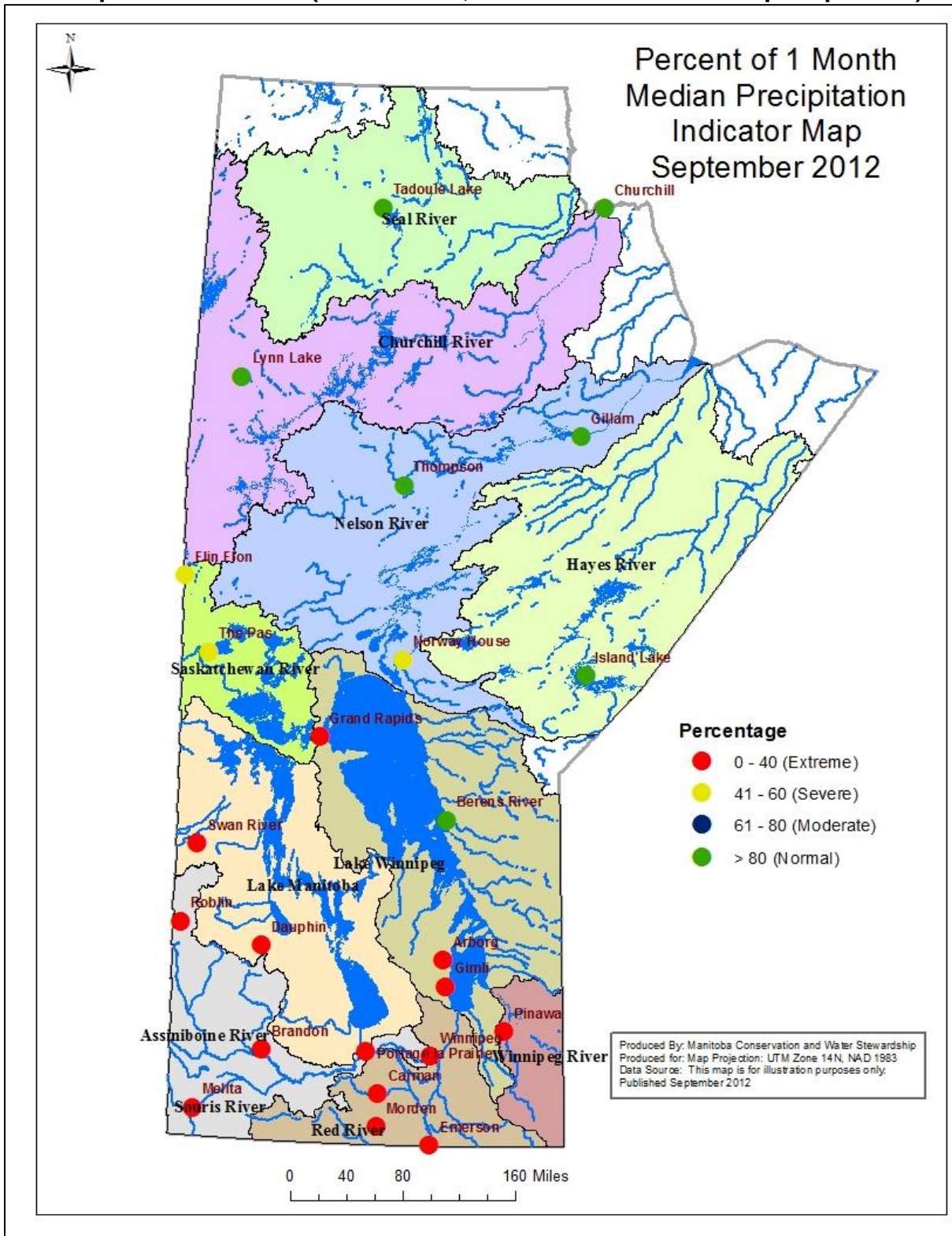
Hydrological Drought is associated with the effect of low rainfall on water levels in rivers, reservoirs, lakes, and aquifers. Hydrological droughts are usually noticed some time after meteorological droughts. First, precipitation decreases and after some time, water levels in rivers and lakes drop. 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.

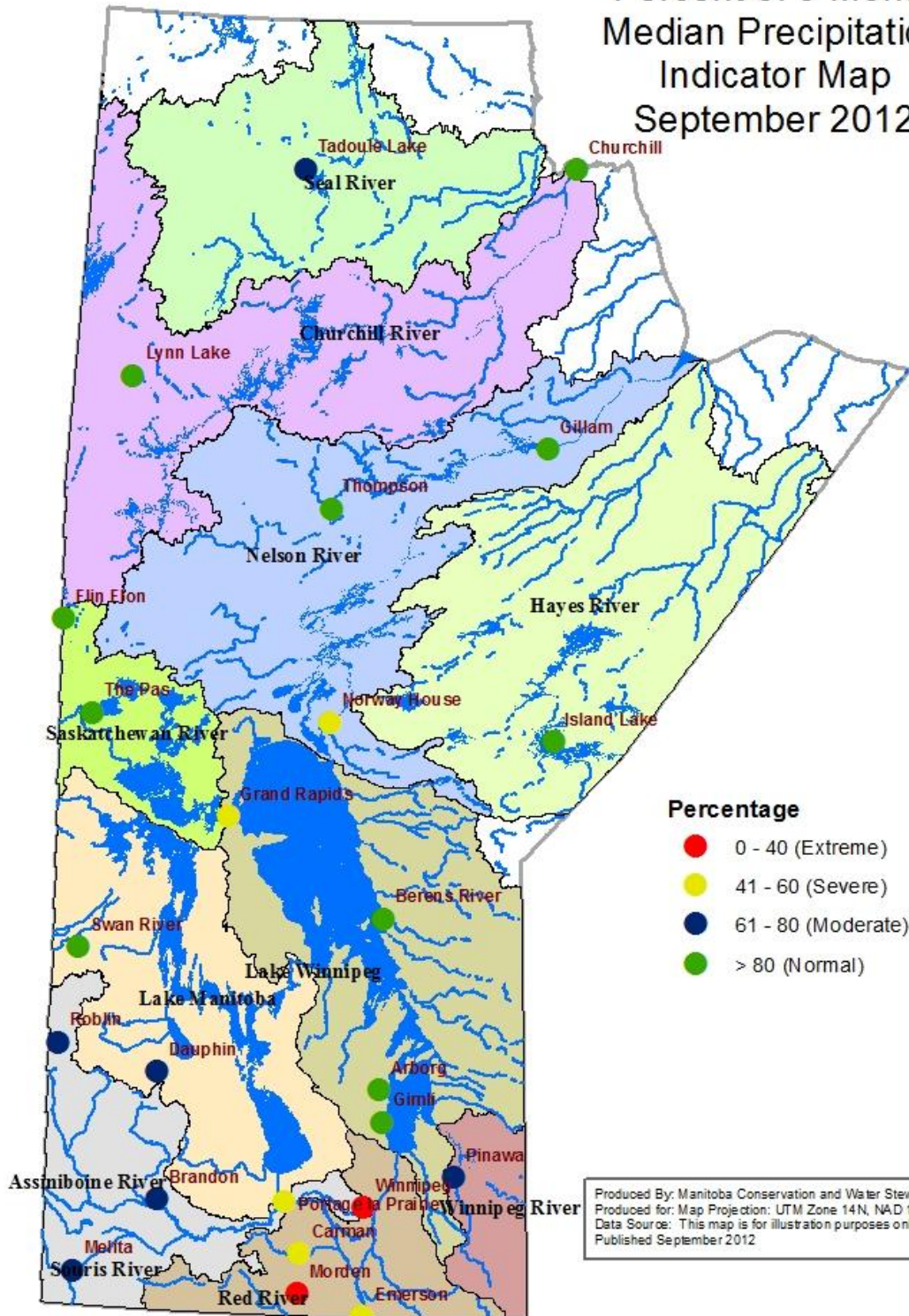
Attachments

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





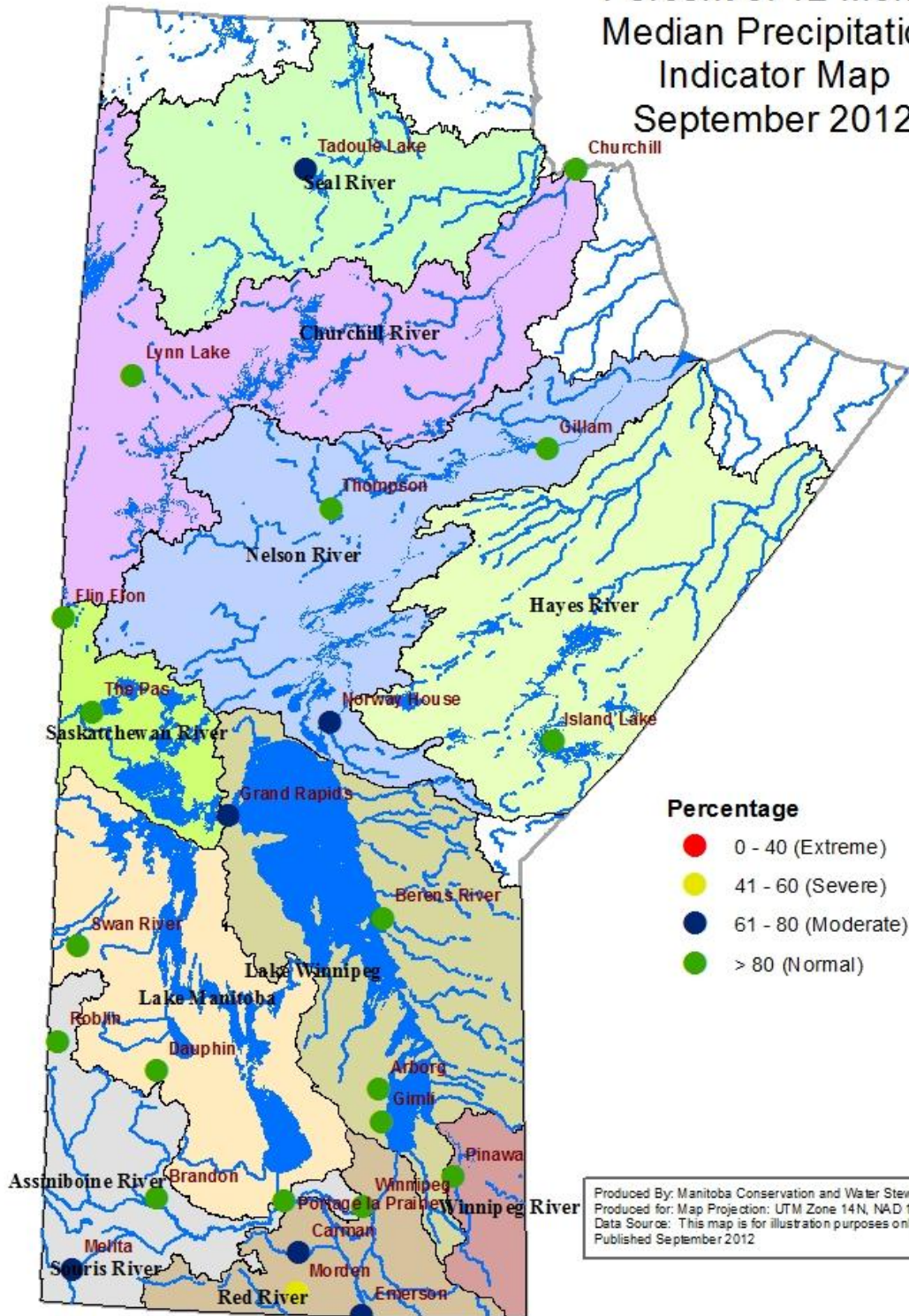
Percent of 3 Month Median Precipitation Indicator Map September 2012



0 40 80 160 Miles

Produced By: Manitoba Conservation and Water Stewardship
Produced for: Map Projection: UTM Zone 14N, NAD 1983
Data Source: This map is for illustration purposes only.
Published September 2012

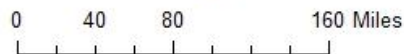
Percent of 12 Month Median Precipitation Indicator Map September 2012



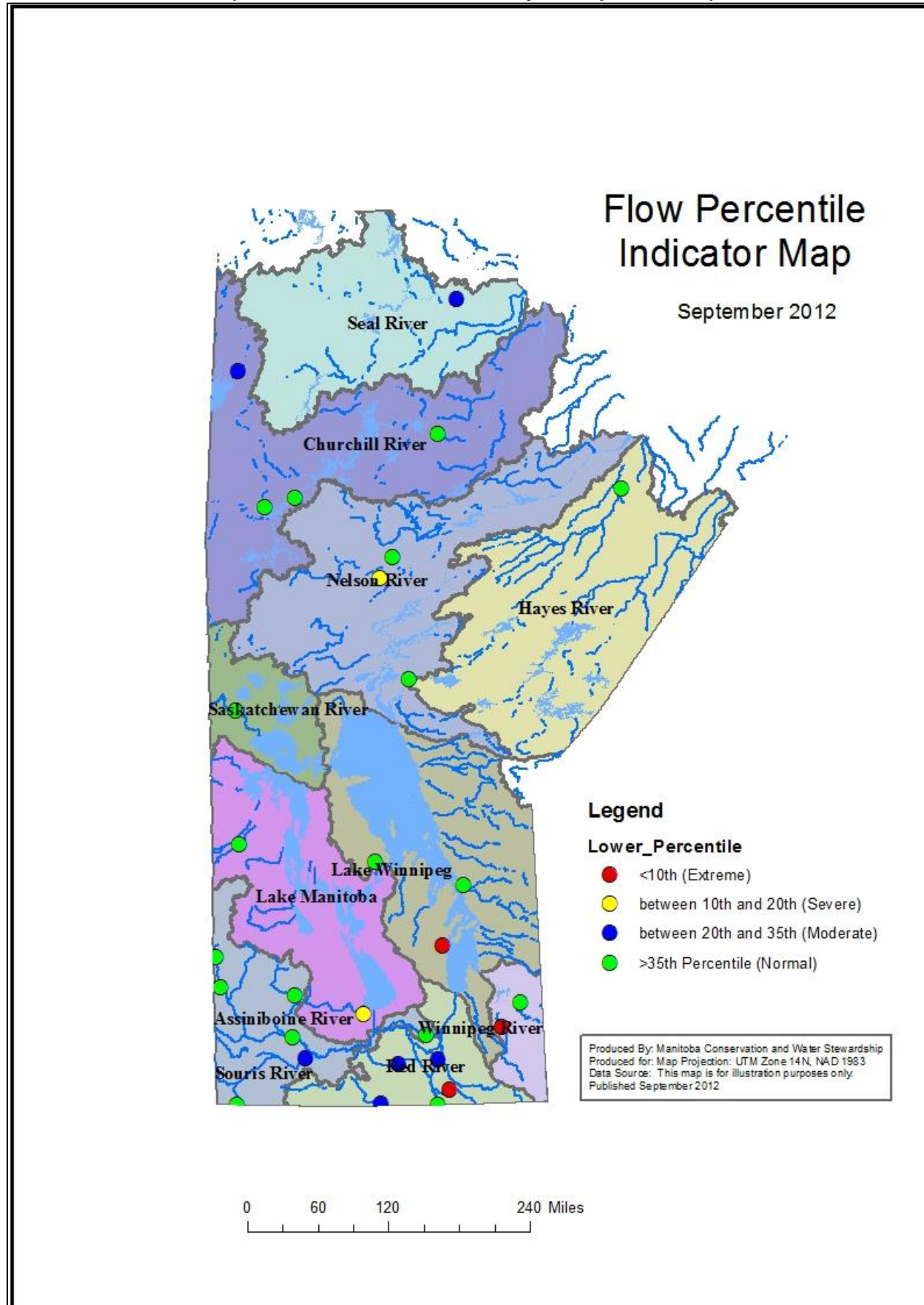
Percentage

- 0 - 40 (Extreme)
- 41 - 60 (Severe)
- 61 - 80 (Moderate)
- > 80 (Normal)

Produced By: Manitoba Conservation and Water Stewardship
 Produced for: Map Projection: UTM Zone 14N, NAD 1983
 Data Source: This map is for illustration purposes only.
 Published September 2012



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

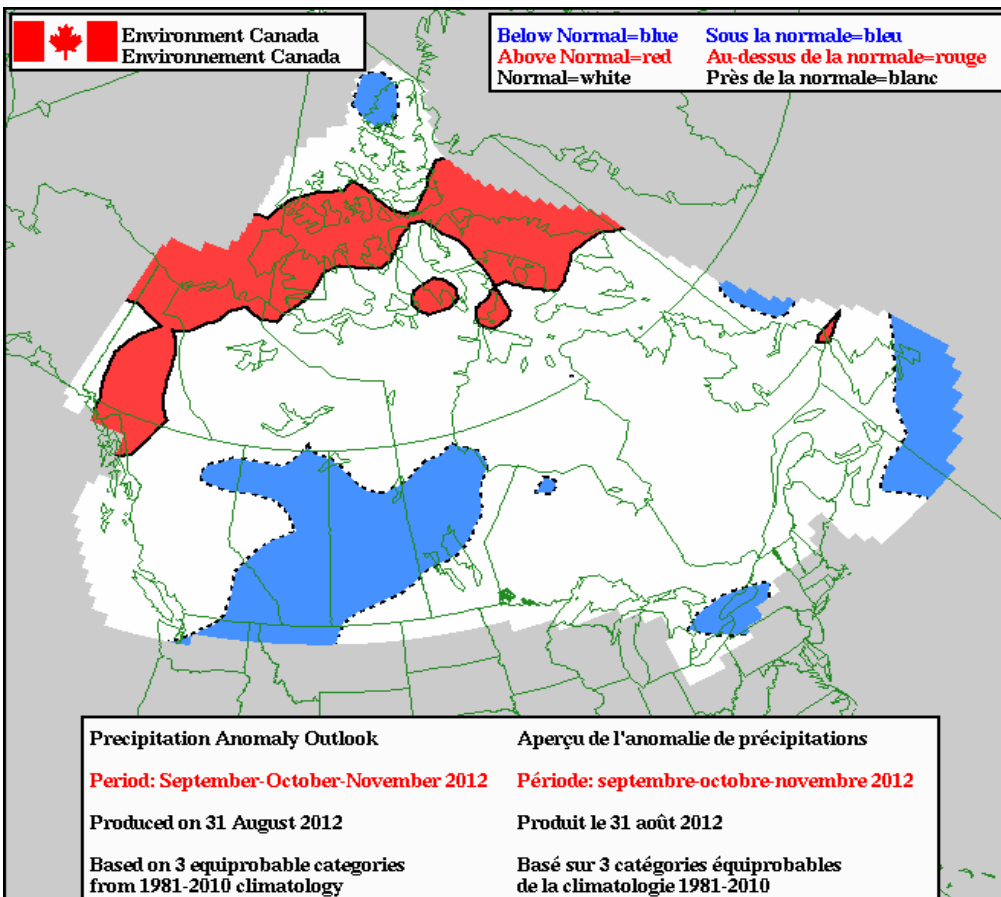
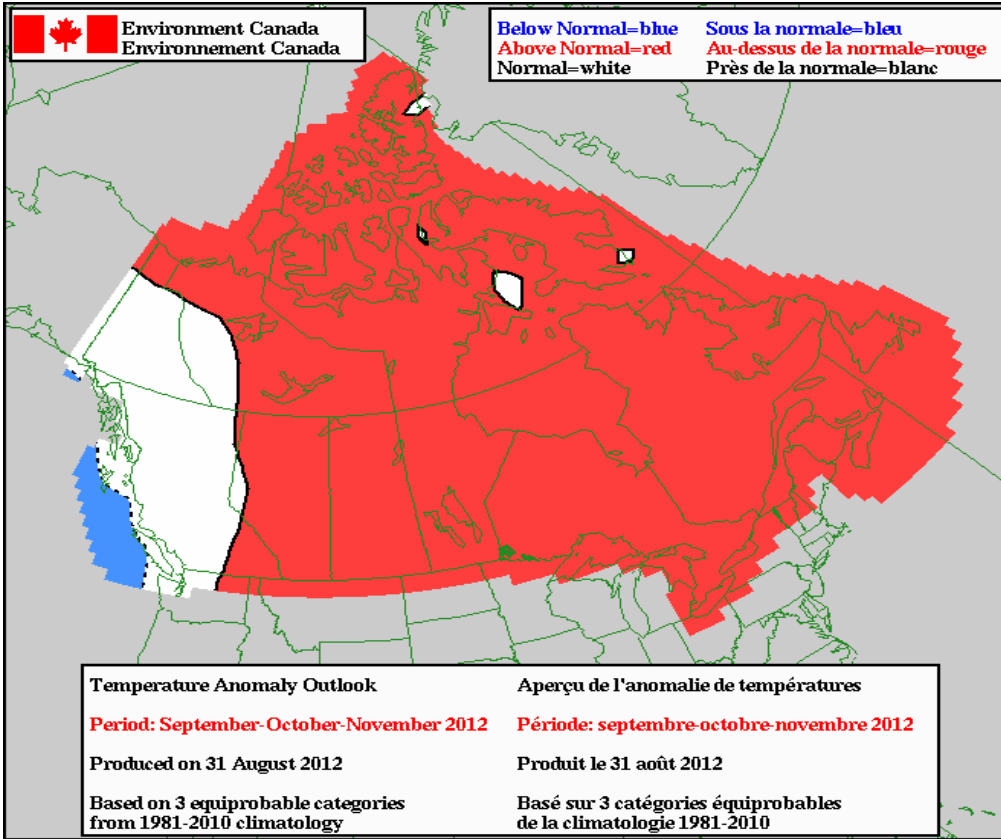


3. Water Supply Reservoir Status (Southern and Western)

Water Supply Reservoir Levels and Storages								
September 24, 2012								
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	1531.64	July 18, 2012	-0.4	520	495	95%
Goudney (Pilot Mound)	Pilot Mound	1482.00	1481.37	September 24, 2012	-0.6	450	406	90%
Irwin		1178.00	1177.82	July 5, 2012	-0.2	3,800	3,692	97%
Jackson		1174.00	1173.73	July 5, 2012	-0.3	2,870	2,922	102%
Kenton (Kenworth)	Kenton	1448.00	1447.81	July 19, 2012	-0.2	600	600	100%
Lake of the Prairies (Shellmouth)*	Brandon, Portage	1402.50	1404.10	September 24, 2012	1.6	300,000	322,200	107%
Killarney	Killarney	1615.00	1614.95	July 30, 2012	0.0	7,360	7,337	100%
Manitou (Mary Jane)	Manitou	1537.00	1535.93	September 24, 2012	-1.1	1,150	1,054	92%
Minnewasta (Morden)	Morden	1082.00	1077.93	September 24, 2012	-4.1	3,040	2,522	83%
Rapid City	Rapid City	1573.50	1573.80	July 19, 2012	0.3	200	221	110%
Lake Wahtopanah (Rivers)	Rivers	1536.00	1535.52	September 24, 2012		24,500	23,972	98%
Stephenfield	Carman	972.00	969.04	September 24, 2012	-3.0	3,810	2,650	70%
Turtlehead (Deloraine)	Deloraine	1772.00	1771.69	July 18, 2012	-0.3	1,400	1,385	99%
Vermilion	Dauphin	1274.00	1273.90	August 27, 2012	-0.1	2,600	2,595	100%

* Summer Target level and storage.

4. Environment Canada 3 Month Outlook



5. Major River Basin

