

**WATER AVAILABILITY AND DROUGHT CONDITIONS REPORT  
Manitoba**

September 6, 2013

**Synopsis/Overview**

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

The three month precipitation indicator indicates moderately dry conditions prevailed in the areas around Morden, Sprague, Pinawa, Gimli, Gillam and Lynn Lake. Severely dry conditions prevailed in the areas around Norway House, Island Lake, and Tadoule Lake.

Overall, flow indicators indicated flows were normal for most rivers across the province. Moderately dry hydrological conditions prevailed in the Whitemouth River near Whitemouth, the Bloodvein River above Bloodvein Bay, the Hayes River near Gods River and the Seal River below Great Island. Flows at the Boyne River near Carman are receding and approaching moderately dry conditions. Severely dry hydrological conditions prevailed in the Taylor River near Thompson, the Kettle River near Gillam and the Cochrane River near Brochet.

Manitoba Agriculture, Food and Rural Initiatives reports that water levels in dugouts were full or close to full in most regions of Agri-Manitoba. In the southwest and northwest regions water levels in dugouts are declining and some dugouts are at 50 % to 60 % of capacity in the southwest region.

Water supply reservoirs in southern and western Manitoba are at, or close to, full supply levels.

**Outlook**

Environment Canada's seasonal forecast for the next three months (September, October and November 2013) is for above normal temperatures for the entire province. Normal precipitation is forecast for the entire province except below normal for areas between Berens River and Island Lake (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 and Thompson have experienced severely dry conditions.

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

Over the short term (one month), moderately dry conditions prevailed in the areas around Morden, Melita and Gimli. Severely dry conditions prevailed in the areas around Winnipeg, Pinawa, Dauphin, Berens River, Norway House and Island Lake. Extremely dry conditions prevailed in the areas around Roblin, Swan River and Flin Flon.

## **Stream Flows**

Stream flow indicators are summarized by basin in Table 1 and on a map in Attachment 2. The monthly flow indicator indicates flows for August were normal or above normal for most rivers across the province. Moderately dry hydrological conditions prevailed in the Whitemouth River near Whitemouth, the Bloodvein River above Bloodvein Bay, the Hayes River near Gods River and the Seal River below Great Island. Severely dry hydrological conditions prevailed in the Taylor River near Thompson, the Kettle River near Gillam and the Cochrane River near Brochet.

## **Water Availability**

### **Reservoir Conditions**

Water supply reservoirs in southern and western Manitoba are full or close to full supply levels. The levels of a few reservoirs are declining. Stephenfield Reservoir near Carman is at 86 % of the full supply level. However, no concern regarding the water supply has been reported near Carman (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 most regions of Agri-Manitoba. In the southwest and northwest regions, water levels in the dugouts are declining and some dugouts are at 50 % to 60 % of capacity in southwest region.

### **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 a number of forest fires, mostly in the northern and eastern regions of Manitoba. 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 and eastern Manitoba received below normal precipitation over the last three months and are experiencing moderately to severely dry conditions. A number of northern and eastern rivers are also experiencing moderately to severely dry hydrological conditions. With Environment Canada's outlook for the next three months for above normal temperature and normal precipitation, there is a risk for continued dry conditions for the far north and northeastern Manitoba. In areas where dry conditions persist, there is an increased risk of forest and grass fires. 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) August 2013	Monthly Precipitation Indicator (Percent of 3 month Median) (June - August 2013)	Monthly Precipitation Indicator (Percent of 12 month Median) (September 2012- August 2013)	Monthly Flow Percentile August 2013 (Lowest 10 <sup>th</sup> -20 <sup>th</sup> -35 <sup>th</sup> )
Red River	Normal except moderately dry for Morden and severely dry for Winnipeg	Normal except moderately dry for Morden and Sprague	Normal	Normal
Winnipeg River	Severely dry	Moderately dry	Normal	Normal except Whitemouth River near Whitemouth
Assiniboine River-Souris River	Normal except moderately dry for Melita and extremely dry for Roblin	Normal	Normal	Normal
Lake Manitoba	Severely to extremely dry	Normal	Normal	Normal
Lake Winnipeg	Normal except moderately dry for Gimli and severely dry for Berens River	Normal except moderately dry for Gimli	Normal except moderately dry for Gimli	Normal except moderately dry for the Bloodvein River above Bloodvein
Saskatchewan River	Normal except extremely dry for Flin Flon	Normal	Normal	Normal
Nelson River	Normal except severely dry for Norway House	Moderately to severely dry except normal for Thompson	Normal except severely dry for Norway House and Thompson	Normal except severely dry for the Taylor River near Thompson and the Kettle River near Gillam
Hayes River	Severely dry	Severely dry	Normal	Moderately dry
Churchill River	Normal	Normal except Moderately dry for Lynn Lake	Moderately dry	Normal except severely dry for the Cochrane River near Brochet.
Seal River	Normal	Severely 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/river_conditions.html)  
[http://www.gov.mb.ca/mit/floodinfo/floodoutlook/lakes\\_information.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](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](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.

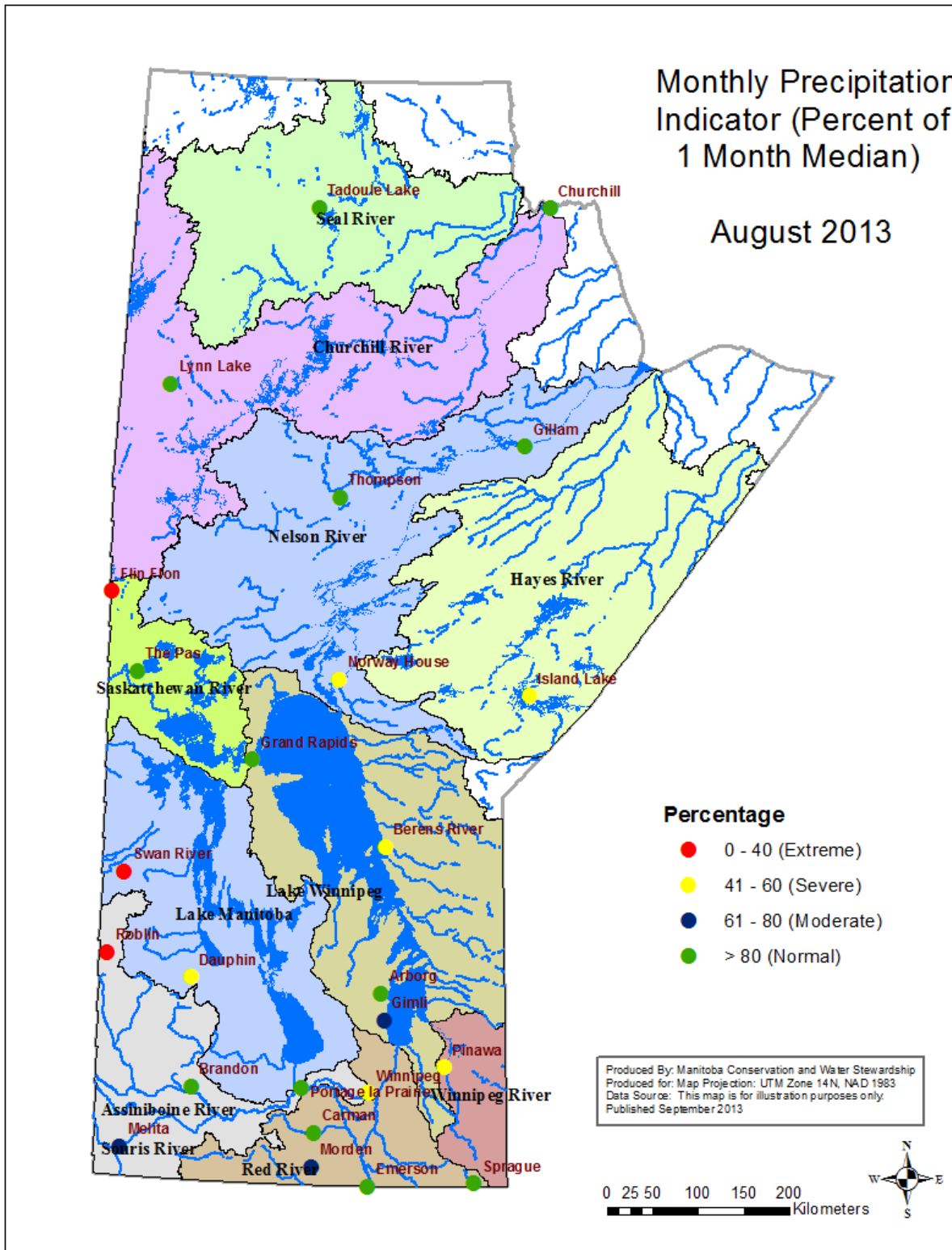
**Hydrological Drought** is associated with the effect of low rainfall on water levels in rivers, reservoirs, lakes, and aquifers. Hydrological droughts are usually noticed some time after meteorological droughts. First, precipitation decreases and after some time, water levels in rivers and lakes drop.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

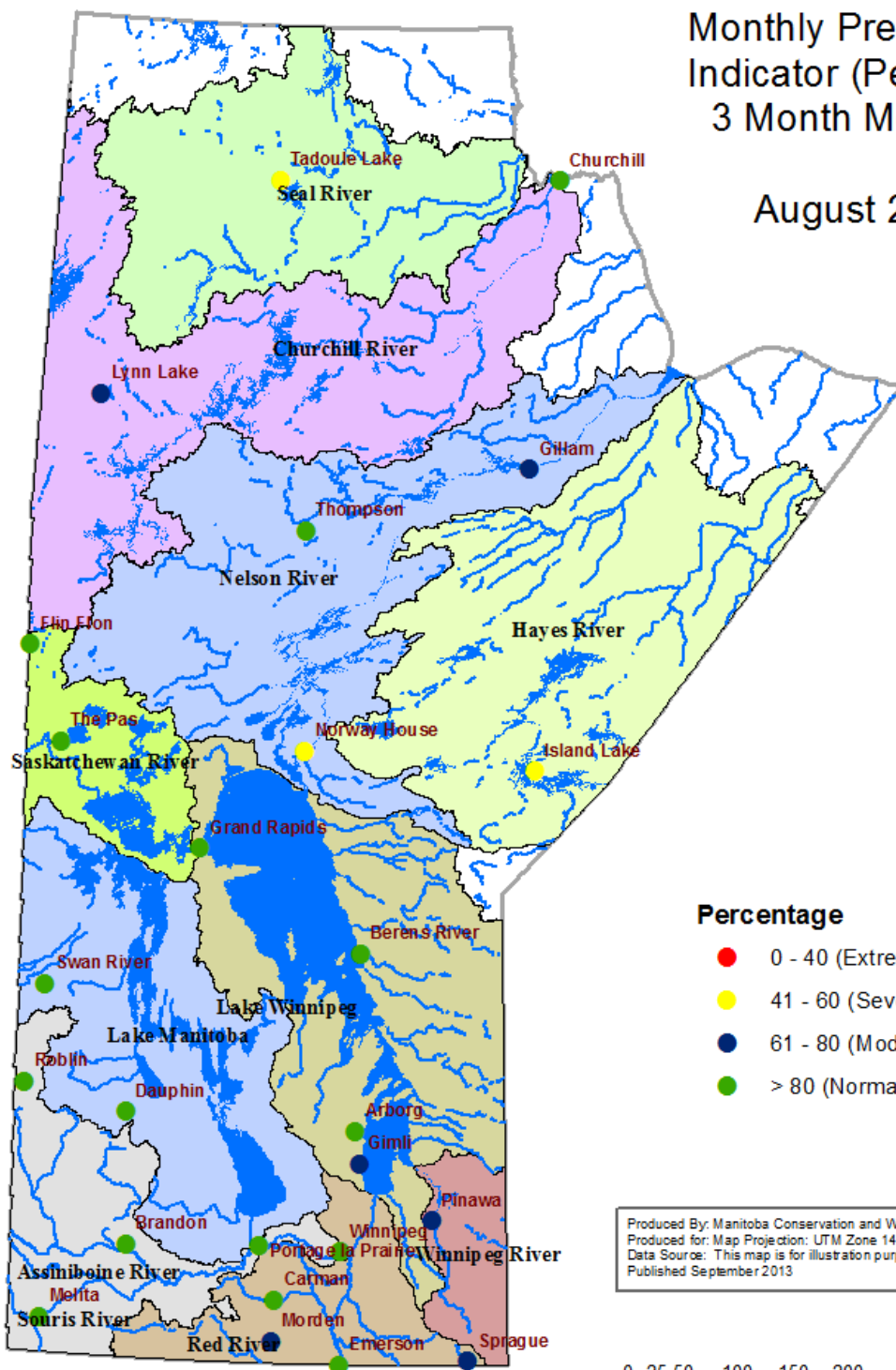
# Attachments

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



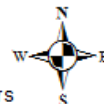
# Monthly Precipitation Indicator (Percent of 3 Month Median)

August 2013



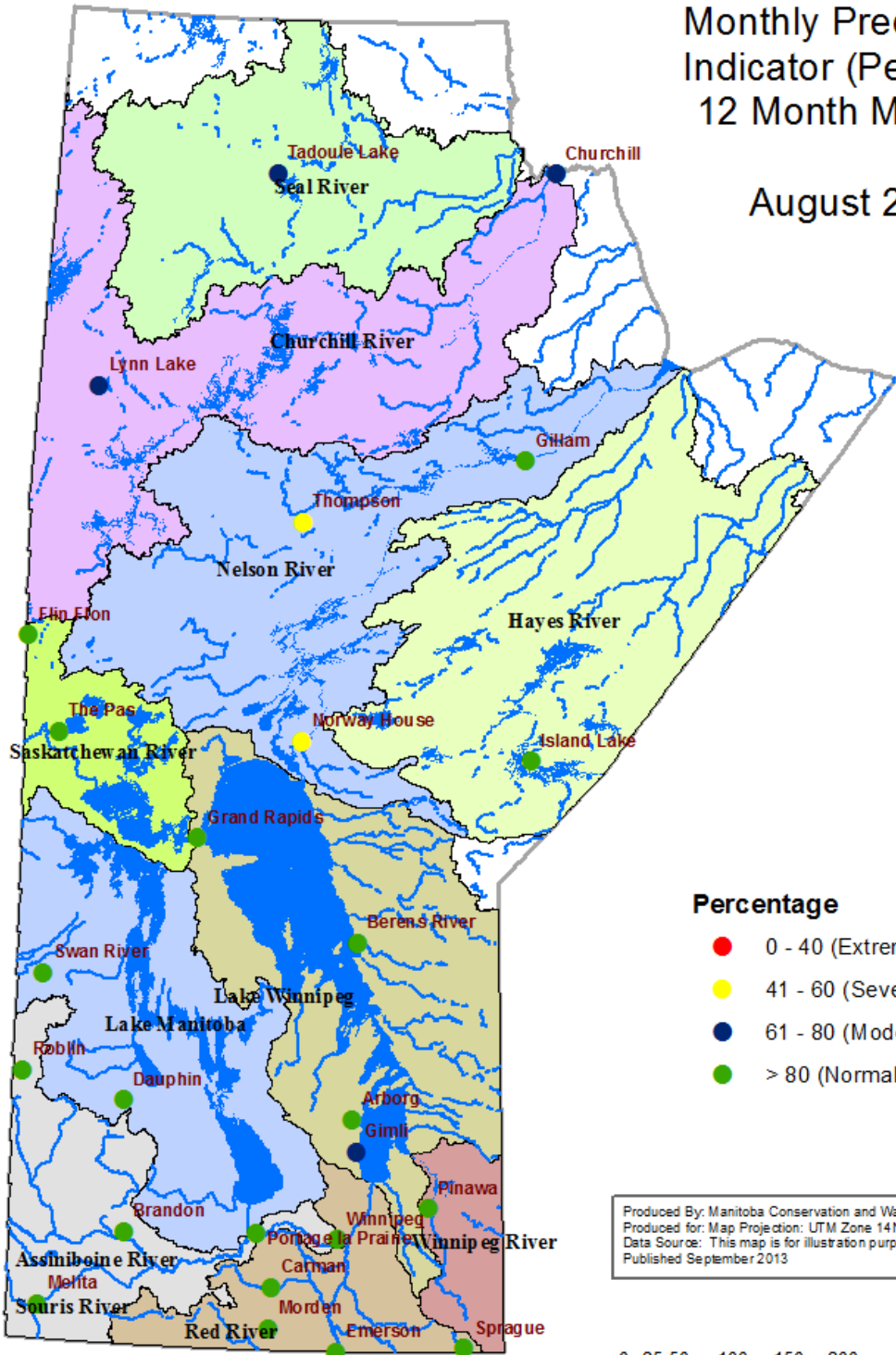
Produced By: Manitoba Conservation and Water Stewardship  
 Produced for: Map Projection: UTM Zone 14N, NAD 1983  
 Data Source: This map is for illustration purposes only.  
 Published September 2013

0 25 50 100 150 200 Kilometers



# Monthly Precipitation Indicator (Percent of 12 Month Median)

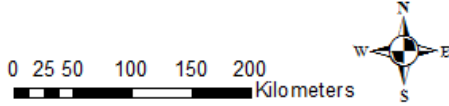
August 2013



### Percentage

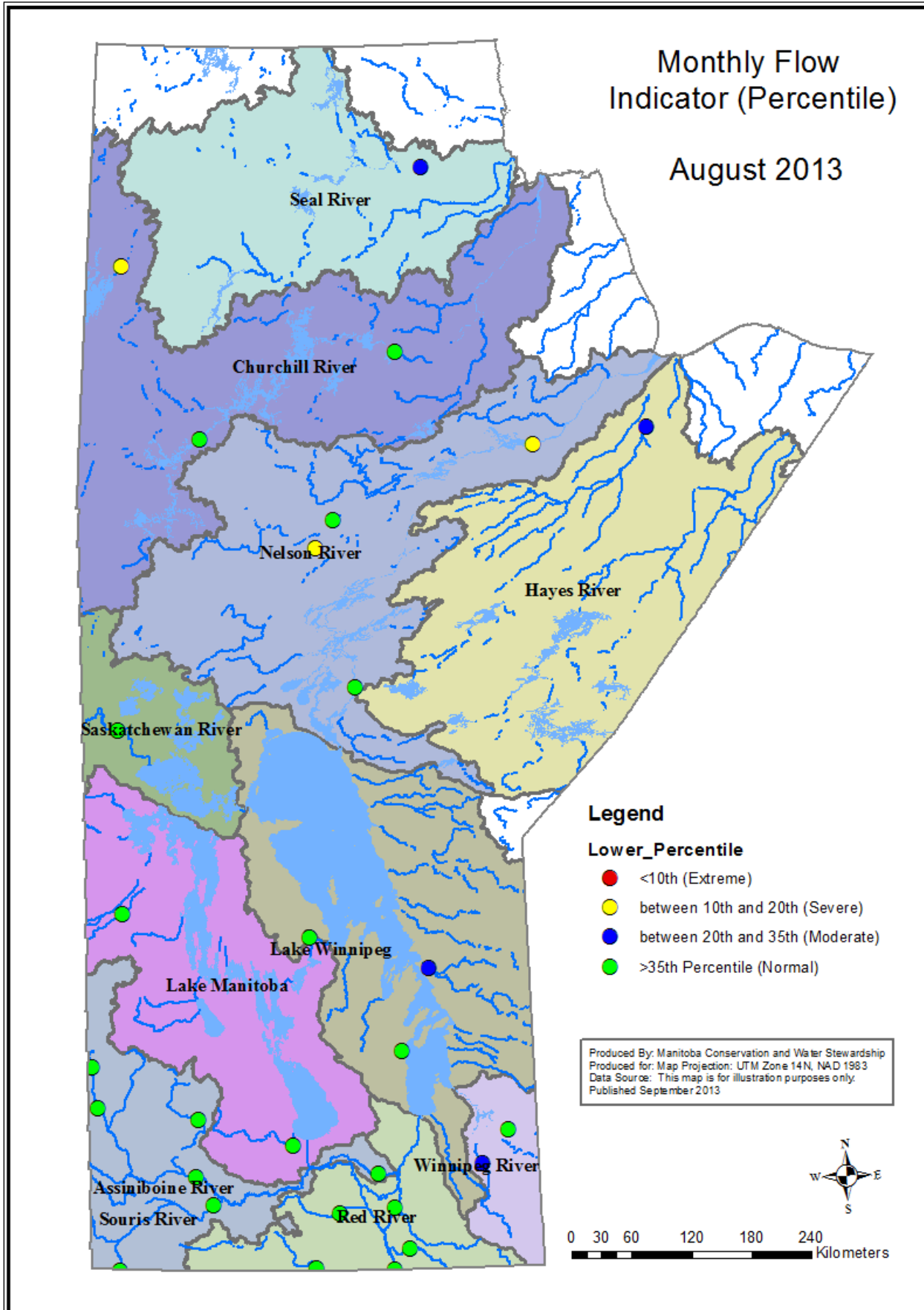
- 0 - 40 (Extreme)
- 41 - 60 (Severe)
- 61 - 80 (Moderate)
- > 80 (Normal)

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 2013





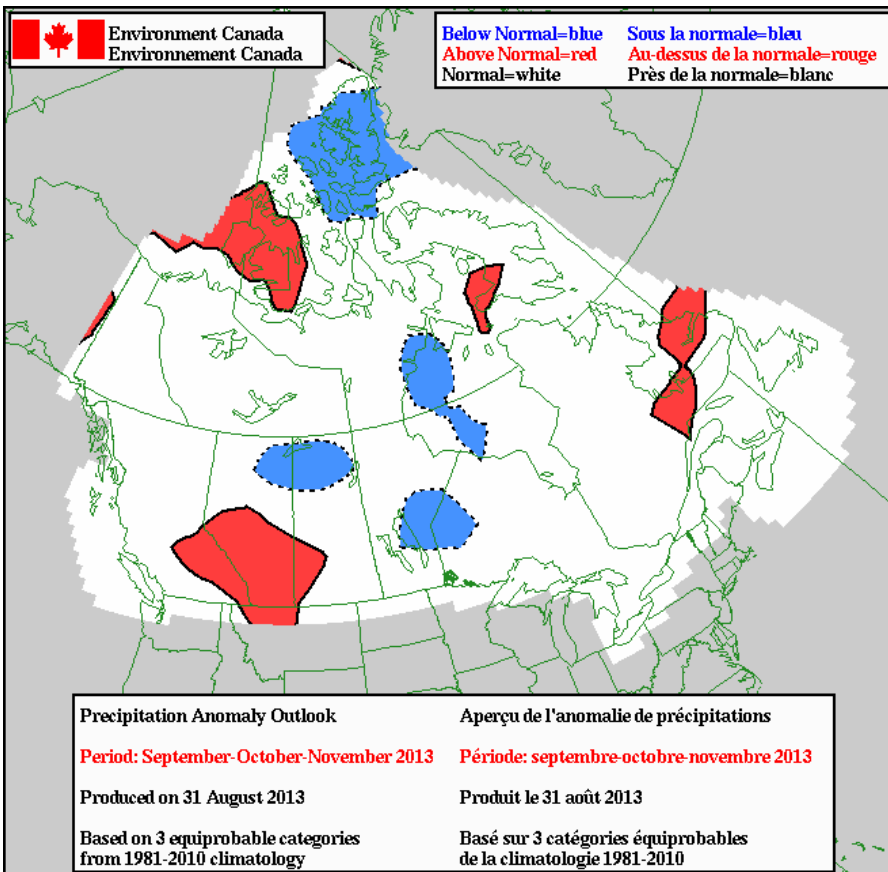
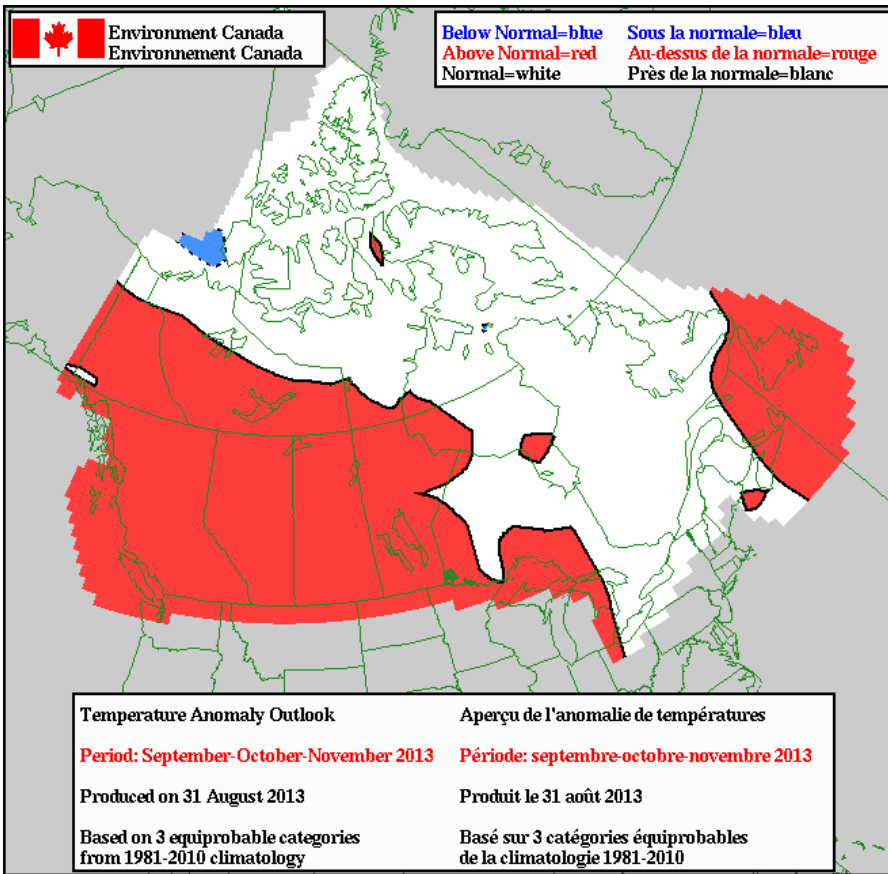
## 2. Monthly Flow Indicator (lower 10<sup>th</sup>-20<sup>th</sup>-35<sup>th</sup> monthly flow percentile)



### 3. Water Supply Reservoir Status (Southern and Western)

Water Supply Reservoir Levels and Storages								
September 3, 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	1531.98	August 20, 2013	0.0	520	519	100%
Goudney (Pilot Mound)	Pilot Mound	1482.00	1482.12	August 23, 2013	0.1	450	456	101%
Lake of the Prairies (Shellmouth)*	Brandon, Portage	1402.50	1401.56	September 3, 2013	-0.9	300,000	288,431	96%
Manitou (Mary Jane)	Manitou	1537.00	1536.62	August 22, 2013	-0.4	1,150	1,116	97%
Minnewasta (Morden)	Morden	1082.00	1081.34	September 3, 2013	-0.7	3,040	3,040	100%
Rapid City	Rapid City	1573.50	1573.29	August 21, 2013	-0.2	200	185	93%
Lake Wahtopanah (Rivers)	Rivers	1536.00	1536.45	September 3, 2013		24,500	25,513	104%
Stephenfield	Carman	972.00	970.86	September 3, 2013	-1.1	3,810	3,280	86%
Turtlehead (Deloraine)	Deloraine	1772.00	1771.85	August 20, 2013	-0.2	1,400	1,393	99%
Vermilion	Dauphin	1274.00	1274.58	August 5, 2013	0.6	2,600	2,615	101%
* Summer Target level and storage.								

## 4. Environment Canada 3 Month Outlook



## 5. Major River Basin

