

## **WATER AVAILABILITY AND DROUGHT CONDITIONS REPORT Manitoba**

April 4, 2012

### **Synopsis/Overview**

Moderate drought conditions (meteorological) are prevailing in agro-Manitoba and the Churchill area. Recent precipitation in eastern Manitoba and the Interlake region has helped to increase moisture levels.

Due to early spring melt, rivers in southern Manitoba have already peaked and have started to recede which is very unusual for this time of the year. Spring runoff peaks were very low in major rivers and their tributaries across southern Manitoba.

Most lakes in eastern Manitoba are experiencing low water levels.

Most water supply reservoirs in southern and western Manitoba have risen to full supply levels due to recent snowmelt and rainfall. Reservoirs have sufficient water supplies for the balance of the year if they are properly managed.

### **Outlook**

Environment Canada's seasonal forecast for the next three months (April, May and June 2012) for Manitoba is for above normal temperatures for the entire province except normal for the far north. Below normal precipitation is forecasted for southern Manitoba and normal precipitation is forecasted for northern Manitoba (Attachment 4).

### **Precipitation**

Over the last 30 days, above average precipitation was received in all regions of Manitoba except for the Swan River, Manitou and Pilot Mound and Windygates areas where precipitation was below average.

Over the last 90 days, below average precipitation was received in all regions of Manitoba except for some portions of the Saskatchewan and Nelson River basins in Manitoba, the Winnipeg River basin and Interlake region where precipitation was average. Well below average precipitation was received in southern parts of Assiniboine and Red River basins and in the Swan River and Churchill areas (Table 1 and Attachment 1)

The most recent standard precipitation index map was prepared by Agriculture and Agri-food Canada in February 2012 (see March 19, 2012 Water Availability and Drought Conditions Report) and an update for March 2012 is not yet available.

### **Stream and River Flows**

Flows in the Red River upstream of Winnipeg and the Winnipeg River and their tributaries are low and below median due to prolonged dry conditions in southeastern Manitoba. The

flow in Whitemouth River is very low and below lower decile conditions. Flows in the Assiniboine, Souris, Swan River and Saskatchewan River basins are above median.

Flows in northern Manitoba are generally above median except for flows in Burntwood River, Churchill River below Fidler lake, Cochrane River near Brochet, Little Beaver River near the mouth and the Seal River basin which are below median (Table 1 and Attachment 2).

### **Lake/Reservoir Conditions**

Most lakes in eastern Manitoba are experiencing below normal water levels.

[http://www.gov.mb.ca/mit/floodinfo/floodoutlook/lakes\\_information.html](http://www.gov.mb.ca/mit/floodinfo/floodoutlook/lakes_information.html)

Water supply reservoirs in southern and western Manitoba have risen to full supply levels due to recent snowmelt and rainfall. Reservoirs have sufficient water supplies for the balance of the year if they are properly managed (Attachment 3).

### **Aquifers**

Groundwater levels in aquifers are generally very good due to significant recharge from last spring. 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.

### **Forecast and Grassland Fires**

Due to the prolonged dry conditions there is a potential risk of forest and grass fires in southern Manitoba. More detailed information on fire conditions will be available on the Manitoba Conservation and Water Stewardship under the Fire Program (website <http://www.gov.mb.ca/conservation/fire/>) the week of April 9<sup>th</sup>.

### **Potential Impacts**

A meteorological drought can contribute to low flows in rivers and streams and to low soil moisture. With the Environment Canada outlook for below normal precipitation with high temperature for southern Manitoba, there are concerns that the province could see the onset of agricultural drought and hydrological drought in southern and western Manitoba. There is also a potential risk of forest and grass fires in southern Manitoba.

Provincial water supply reservoirs have sufficient water supplies for the balance of the year if they are properly managed.

**Table 1: Detail by Major River Basin (Attachments: 1, 2 and 5)**

Basin (in Manitoba)	Indicators			Major River Flow Conditions As of April 2, 2012
	1 month Precipitation (March 3 to April 1, 2012)	3 months Precipitation (December 29, 2011 to March 27, 2012)	Standard Precipitation Index (SPI)	
Red River	Above average	Well below average	n/a	Below median except above median for downstream of Winnipeg. Well below median for tributaries except the Assiniboine River
Winnipeg River	Above average	Below to average	n/a	Below median. Well below for Whitemouth River.
Assiniboine River-Souris River	Below to above average	Well below average	n/a	Above median
Lake Manitoba	Below to above average	Below average	n/a	Above median
Lake Winnipeg	Above average	Below to average	n/a	Above median except below median for Icelandic River
Saskatchewan River	Above average	Below to average	n/a	Above median
Nelson River	Above average	Below to above average	n/a	Above median except below median for Burntwood River
Hayes River	Above average	Below to average	n/a	Below median
Churchill River	Above average	Average	n/a	Above median except below median for Churchill below Fidler lake, Cochrane River near Brochet and Little Beaver River near the Mouth
Seal River	n/a	n/a	n/a	Below median

**Note: Median is 50<sup>th</sup> percentile.**

## Acknowledgements

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

- Agriculture and Agri-food Canada (Drought watch); North America Drought Monitor:  
<http://www4.agr.gc.ca/DW-GS/current-actuelles.aspx?lang=eng>
  - Regional site: [30 and 90 precipitation](#)
  - National Site: [Palmer Drought](#) and [Standard Precipitation Indices](#)
- Manitoba Conservation and Water Stewardship: Flow and Lake information:  
[http://www.gov.mb.ca/waterstewardship/floodinfo/river\\_conditions.html](http://www.gov.mb.ca/waterstewardship/floodinfo/river_conditions.html)  
[http://www.gov.mb.ca/waterstewardship/floodinfo/lakes\\_information.html#lake\\_levels](http://www.gov.mb.ca/waterstewardship/floodinfo/lakes_information.html#lake_levels).
- 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
- 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.

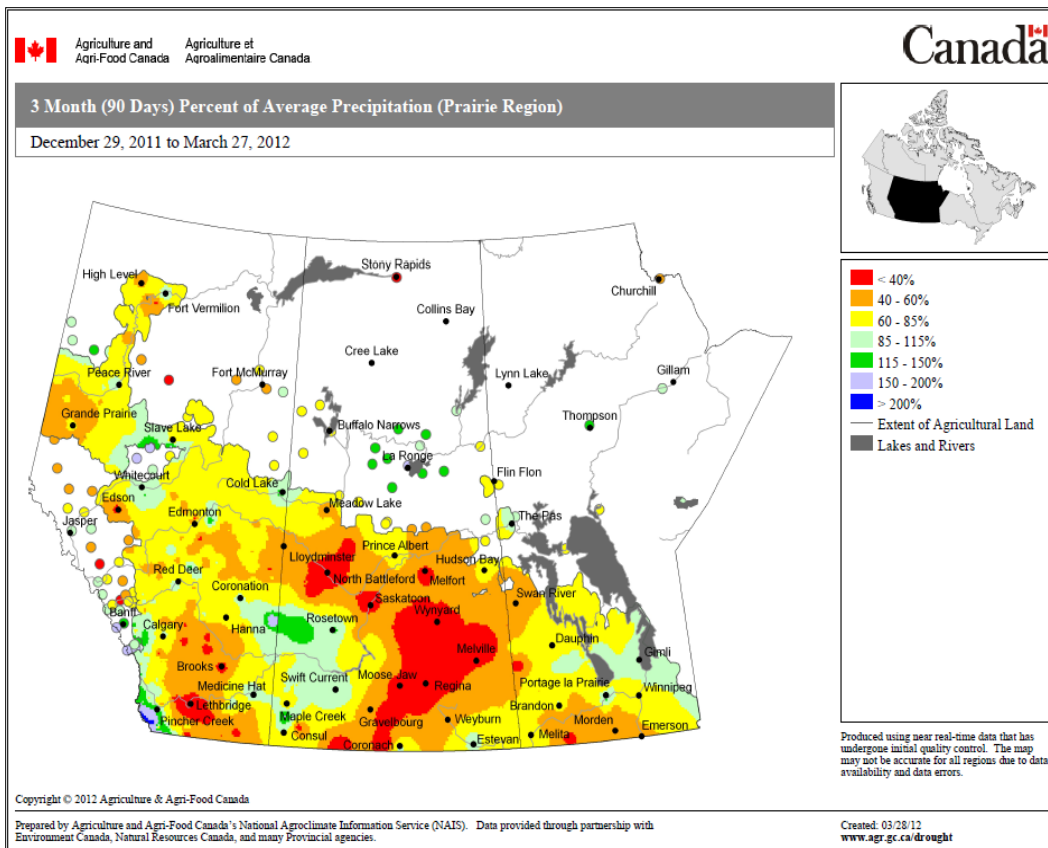
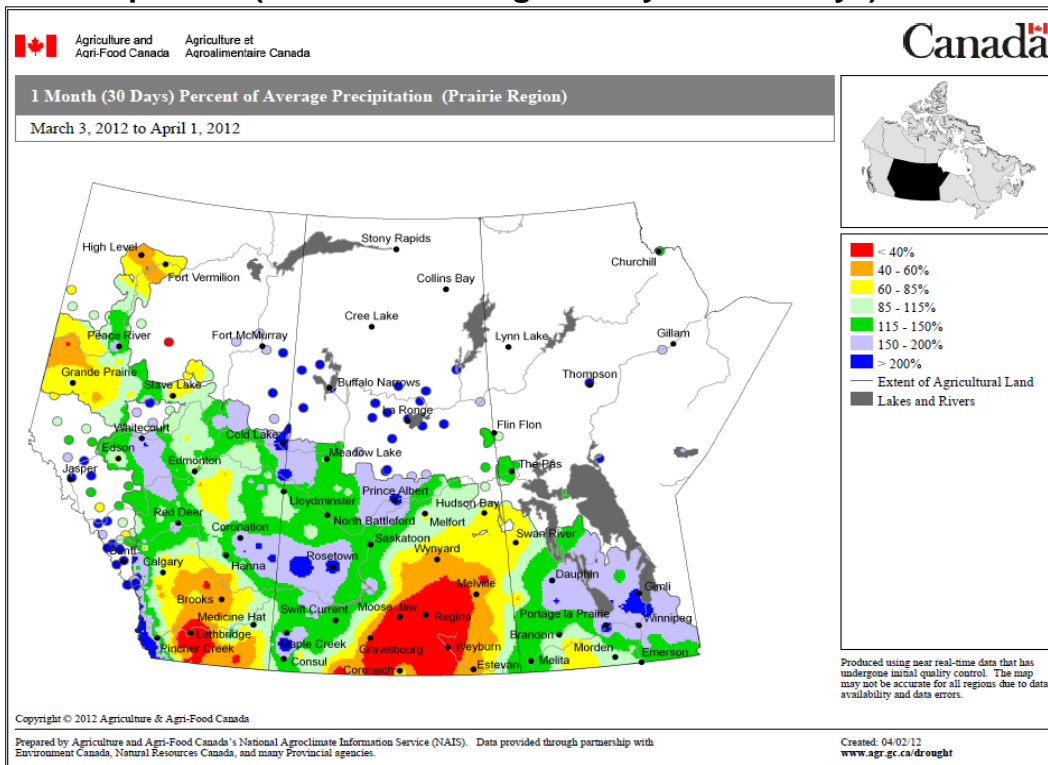
**Hydrological Drought** is associated with the effect of low rainfall on water levels in rivers, reservoirs, lakes, and aquifers. Hydrological droughts are usually noticed some time after meteorological droughts. First, precipitation decreases and after some time, water levels in rivers and lakes drop.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

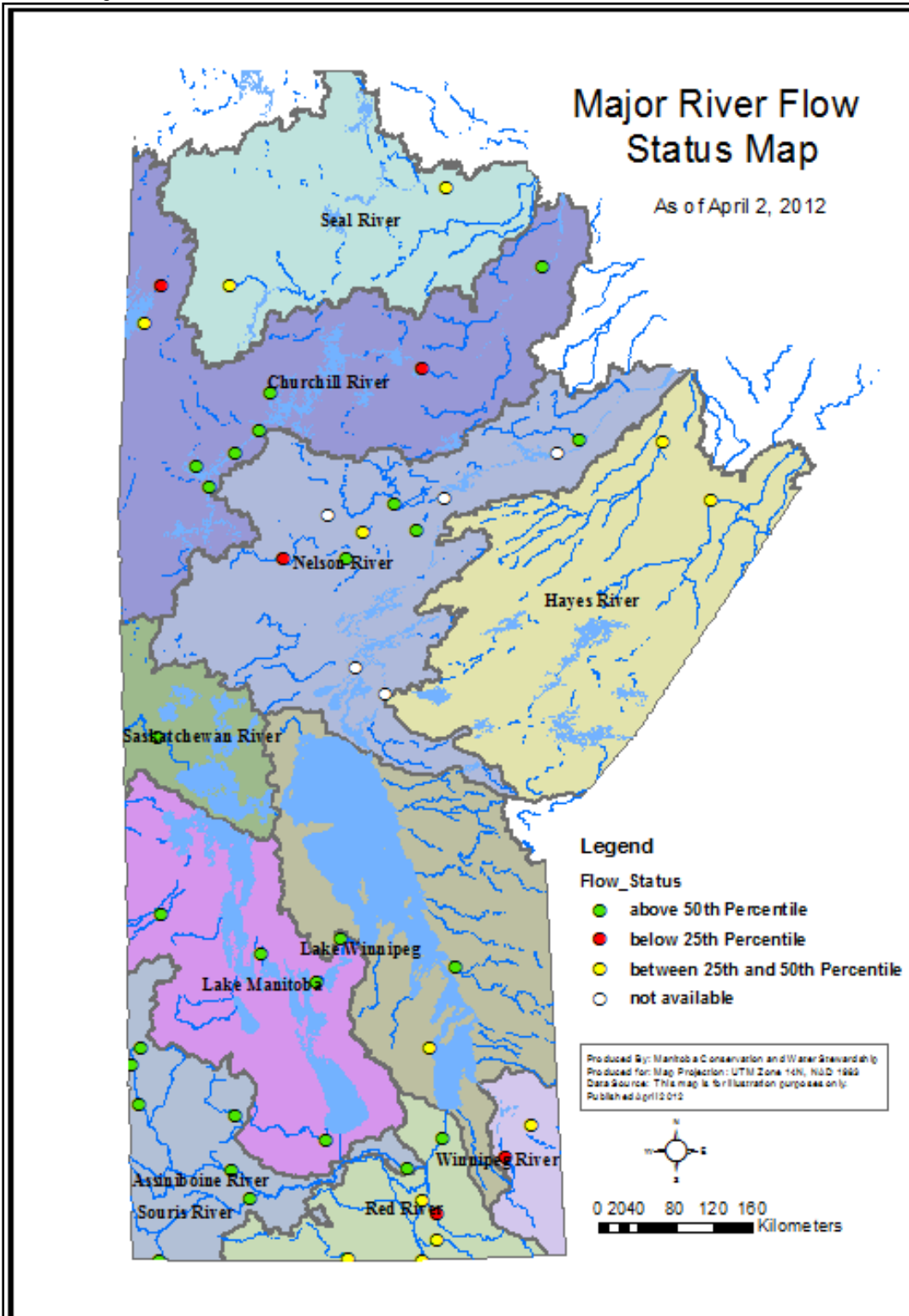
**Socioeconomic Drought** occurs when the supply fails to meet the demand for an economic good(s) such as domestic water supplies, hay/forage, food grains, fish, and hydroelectric power, due to weather related water supply shortages from one or both of natural or managed water systems. At any time during meteorological, hydrological, or agricultural droughts, a socioeconomic drought can occur.

# Attachments

## 1. Precipitation (Percent of average:30 days and 90 days)



## 2. Major River Flow Status



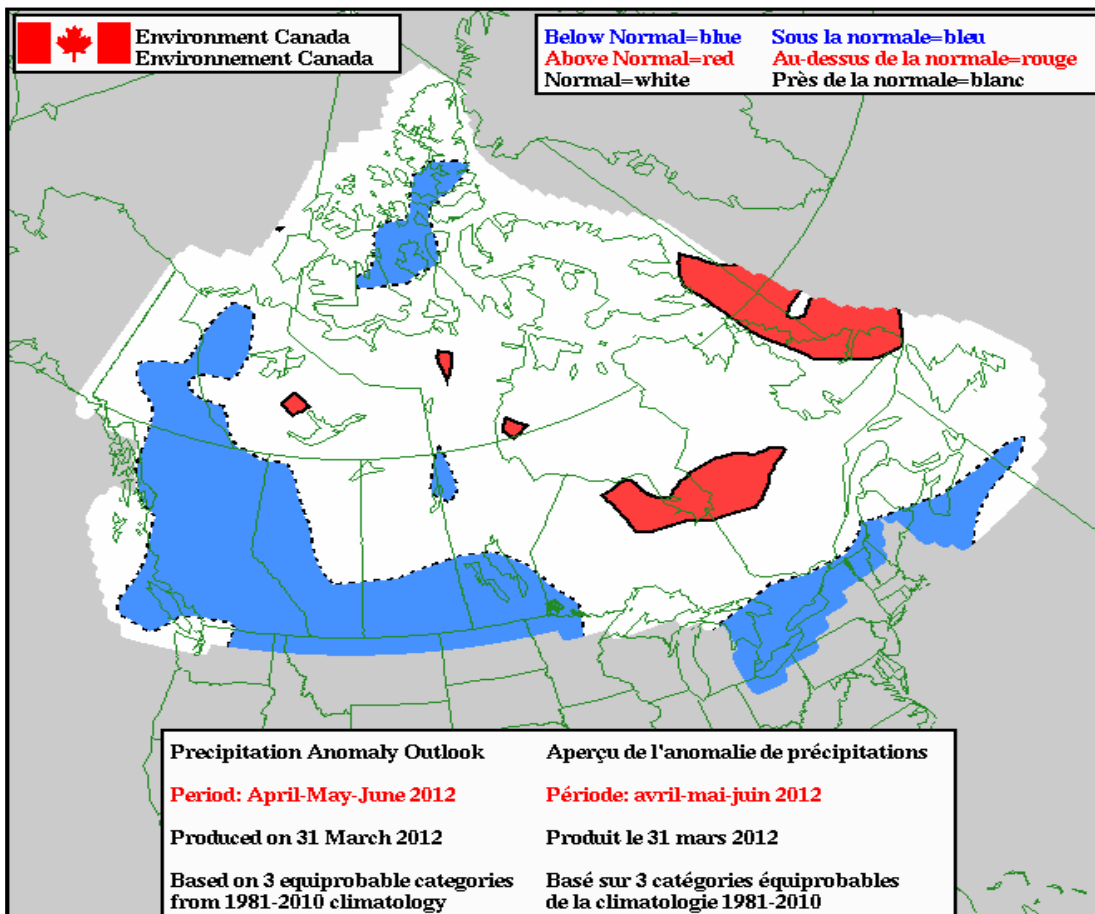
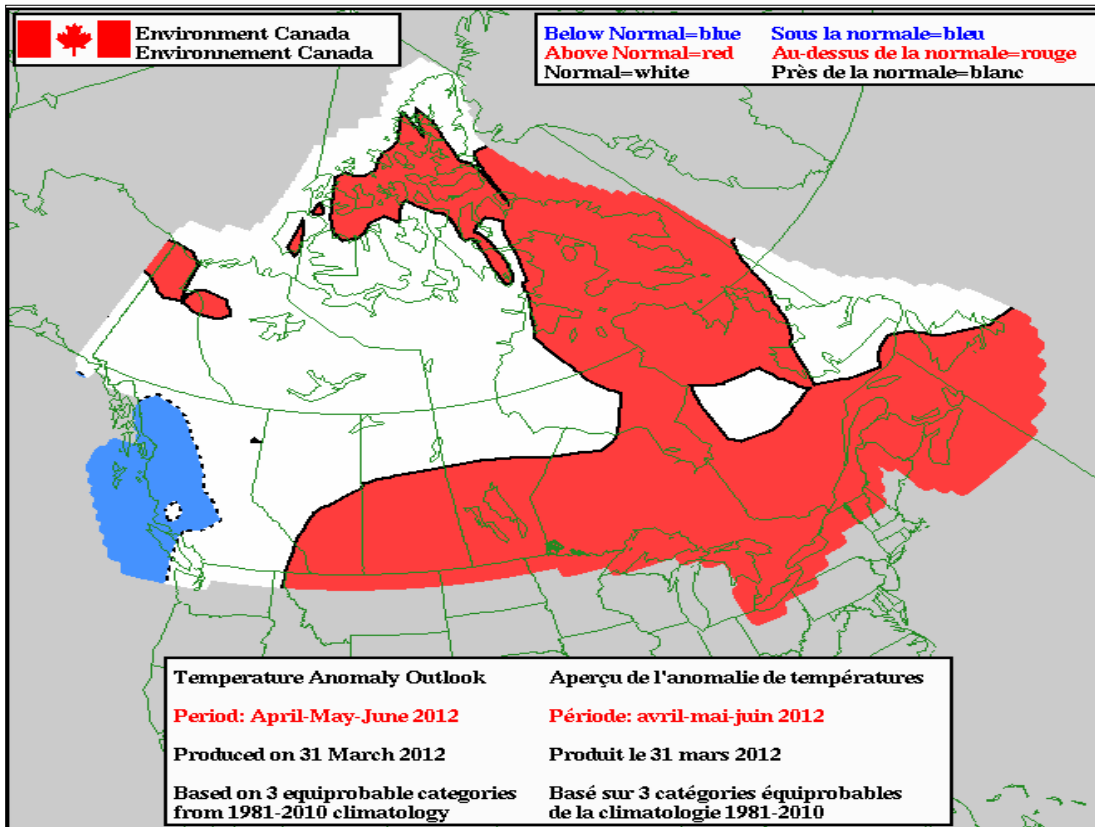
### 3. Water Supply Reservoir Status (Southern and Western)

Water Supply Reservoir Levels and Storages								
April 2, 2011								
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	1530.97	January 9, 2012	-1.0	520	448	86%
Goudney (Pilot Mound)	Pilot Mound	1482.00	1482.12	April 2, 2012	0.1	450	456	101%
Irwin	Neepawa	1178.00	1178.23	March 22, 2012	0.2	3,800	3,950	104%
Jackson	Austin, MacGregor	1174.00	1173.05	March 21, 2012	-1.0	2,870	2,750	96%
Kenton (Kenworth)	Kenton	1448.00	N/A			600	600	100%
Lake of the Prairies/Shellmouth*	Brandon, Portage	1402.50	1402.55	April 2, 2012	0.0	300,000	300,600	100%
Killarney	Killarney	1615.00	1614.55	February 13, 2012	-0.5	7,360	7,153	97%
Manitou (Mary Jane)	Manitou	1537.00	1536.16	April 2, 2012	-0.8	1,150	1,074	93%
Minnewasta (Morden)	Morden	1082.00	1080.41	April 2, 2012	-1.6	3,040	2,887	95%
Rapid City	Rapid City	1573.50	N/A			200	221	100%
Rivers	Rivers	1536.00	1536.81	April 2, 2012		24,500	26,322	107%
Stephenfield	Carman	972.00	972.47	April 2, 2012	0.5	3,810	4,031	106%
Turtlehead (Deloraine)	Deloraine	1772.00	N/A			1,400	1,400	100%
Vermilion	Dauphin	1274.00	1274.78	April 1, 2012	0.8	2,600	2,650	102%

\* Summer Target level and storage. Reservoir drawdown in winter for spring flood control.



#### 4. Environment Canada 3 Month Outlook





## 5. Major River Basin

