

# 2020 JANUARY BASINS CONDITION REPORT

**Manitoba Hydrologic Forecast Centre**  
**Manitoba Infrastructure**

February 2020

# **Basins Condition Report**

Assessment as of January 28, 2020

## **Introduction:**

The amount of spring runoff in Manitoba rivers and streams is largely dependent on parameters such as soil moisture, snow accumulation, soil frost depth, base flow/level condition, snowmelt rate and the amount and timing of the spring rain. The magnitude of peak flows in Manitoba rivers is also dependent on the timing of peak flows from the United States and Saskatchewan portion of the basins. The coincidence of local peak flows with the peak flows from the U.S. and Saskatchewan leads to higher flows in Manitoba rivers.

The following information summarizes current conditions for Manitoba as of January 28, 2020. The actual extent of spring runoff is still largely dependent on weather conditions between now and April 2020.

## **Soil Moisture:**

As of January 28, 2020, soil moisture conditions were reasonably well known based on airborne and surface based surveys completed in the Fall of 2019. Soil moisture is also known from a soil moisture index, which was computed from weighted precipitation for the period from May to October, 2019.

Soil moisture ranges from well above normal in central and southern Manitoba (including the Red River Valley) to near normal in northern Manitoba. In the United States portion of the Red River watershed, soil moisture is near record high levels. Above average soil moisture indicates the potential for above average spring runoff.

## **Precipitation Record:**

Precipitation records since November 01, 2019 indicate precipitation is tracking below normal to well below normal in most parts of Manitoba and Saskatchewan. Precipitation is tracking below normal to over 200% of normal in the United States portions of the Red River and the Souris River (Figure 1) basins.

Generally, most of Manitoba and Saskatchewan received below 50 mm of precipitation since November 01, 2019. The United States portion of the Red River and the Souris River received between 50 mm and 130 mm of precipitation during this time (Figure 2).

Above normal precipitation indicates the potential for above average spring runoff. Similarly, below normal precipitation indicates the potential for below normal spring runoff.

### **Snow Water Equivalent (SWE)**

Snow water equivalent is a measure of the amount of water content in the snow. This data is collected from Snow Data Assimilation System (SNODAS) analysis.

Snow water equivalent for Manitoba watersheds range between zero and 120 mm. The largest amount of the snow water equivalent is located at the southern end of the United States portion of the Red River basin (Figure 3).

### **Frost Depth:**

Frost depth is normal to below normal in most Manitoba watersheds (Figure 4).

Moist and frozen soils greatly reduce infiltration of melt water and thus increase spring runoff. Below normal frost depth is, therefore, a favorable condition in reducing the extent of spring runoff.

### **Base Flows and Levels:**

Base flows and levels in Manitoba rivers have been declining since the Fall of 2019. However, base flows and levels are still much above normal for some southern and northern Manitoba rivers. Base flows and levels are normal to above normal in central Manitoba basins (Figure 5).

Base flows and levels indicate the amount of storage in rivers before the spring runoff. Higher base flows and levels also indicate the degree of ground saturation in those watersheds.

### **Lake Levels:**

Lake Winnipeg is currently around 714.9 ft (near the upper end of the operating range) and is expected to slowly decline to near 714.6 ft by the end of March 2020. Lake Manitoba and Dauphin Lake are expected to be within their operating range before spring runoff. Levels in Whiteshell lakes have been dropping since the peak levels observed in the Fall of 2019. However, some lakes are still above normal for this time of the year. Current lake levels and expected levels by March 31<sup>st</sup> are shown in Table 1.

### **Spring Flood Outlook:**

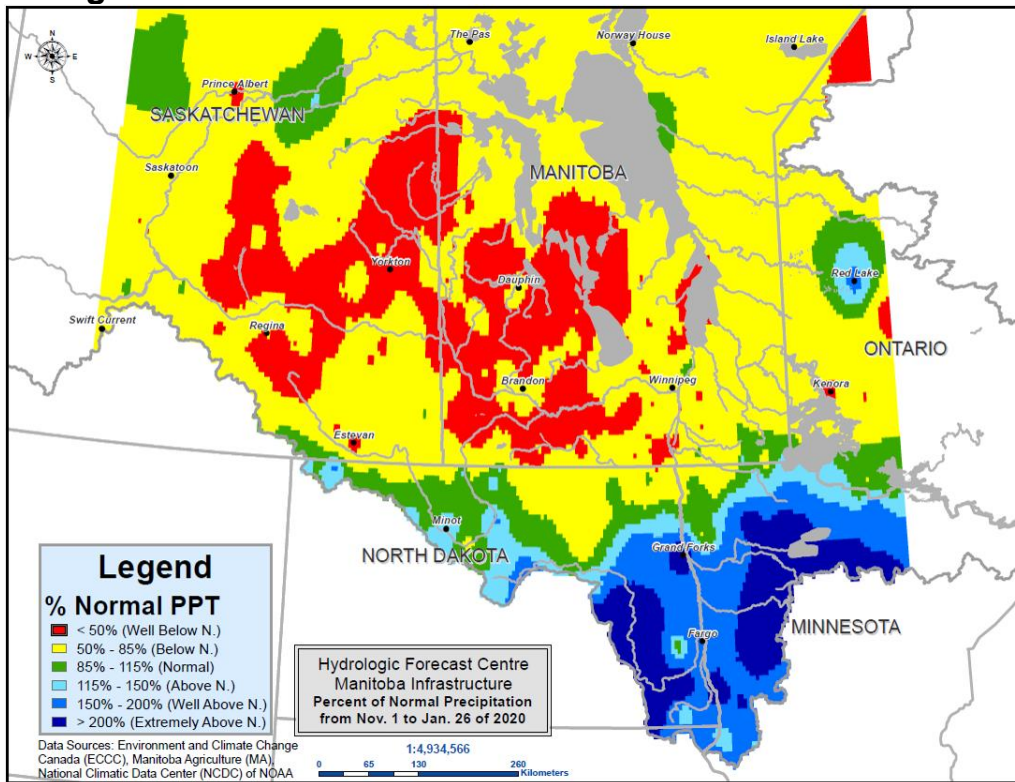
It should be noted that weather conditions from now through April will largely determine the occurrence, extent and severity of spring runoff in 2020.

The first Flood Outlook will be released at the end of February with another Flood Outlook released at the end of March.

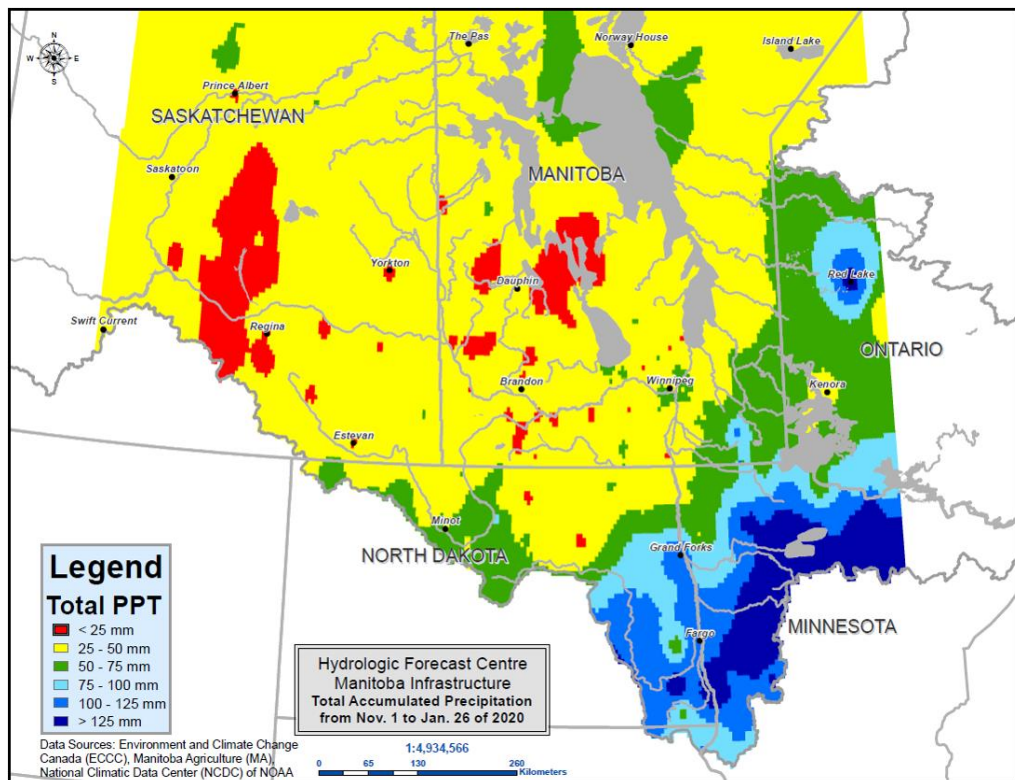
**Table 1. Current lakes level and expected level by March 31<sup>st</sup>**

Lakes	Current Level (ft)	Operating Range or Long Term Average (ft)	Expected Level by March 31, 2020 (ft)
Lake Manitoba	811.5	810.5 - 812.5	811.5
Lake Winnipeg	714.90	711 - 715	714.60
Lake St. Martin	799.15	797 - 800	799.3
Lake Winnipegosis	830.7	830.5	830.7
Dauphin Lake	854.15	853.0 - 854.8	854.2
Shellmouth Reservoir	1397.24		1386 - 1396

## List of Figures



**Figure 1. Precipitation record as percent of normal since November 2019**



**Figure 2. Precipitation record in mm since November 01, 2019**

### SNODAS SWE Analysis at 2020-01-29 06Z (mm)

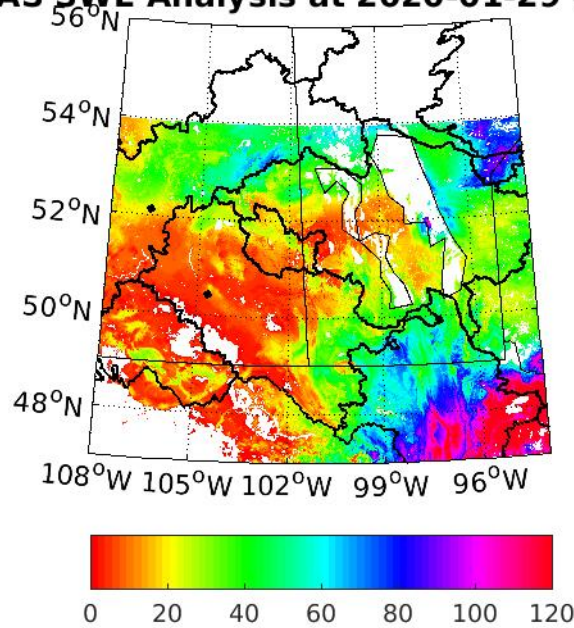


Figure 3. Snow Water Equivalent in mm obtained from SNODAS analysis

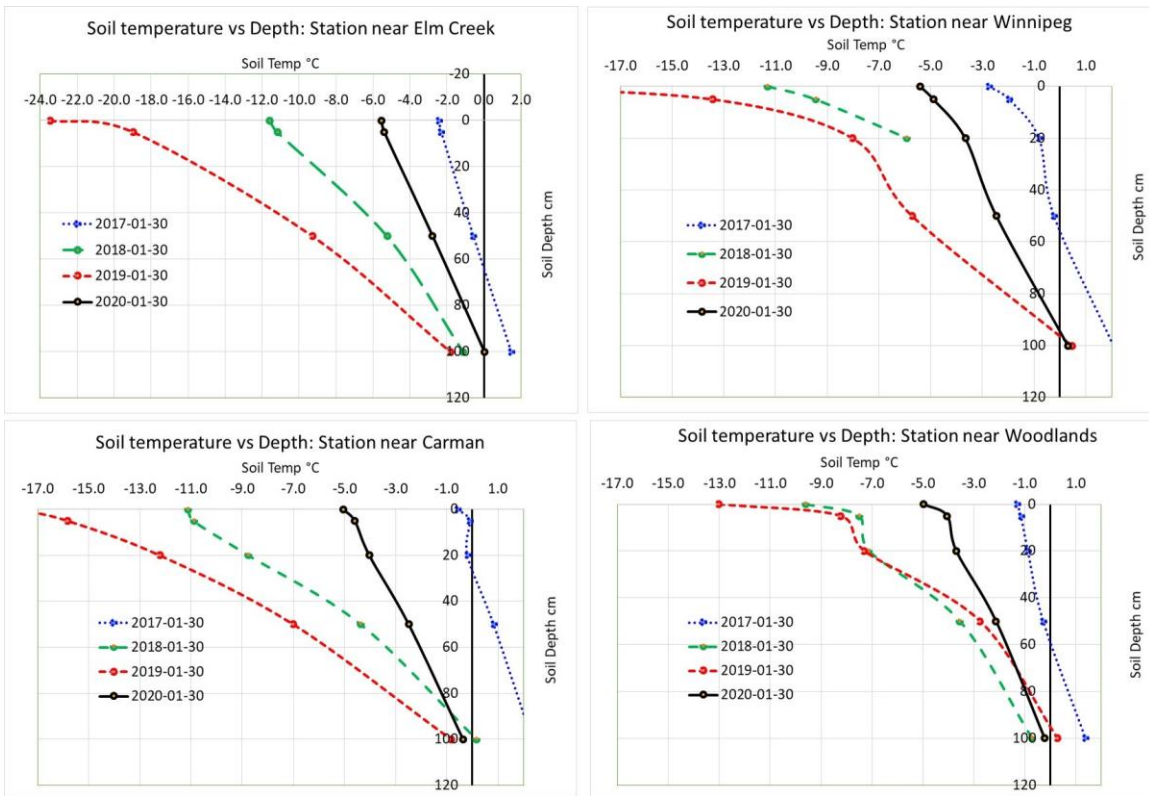


Figure 4. Frost depth measurements and comparison to previous years at selected locations

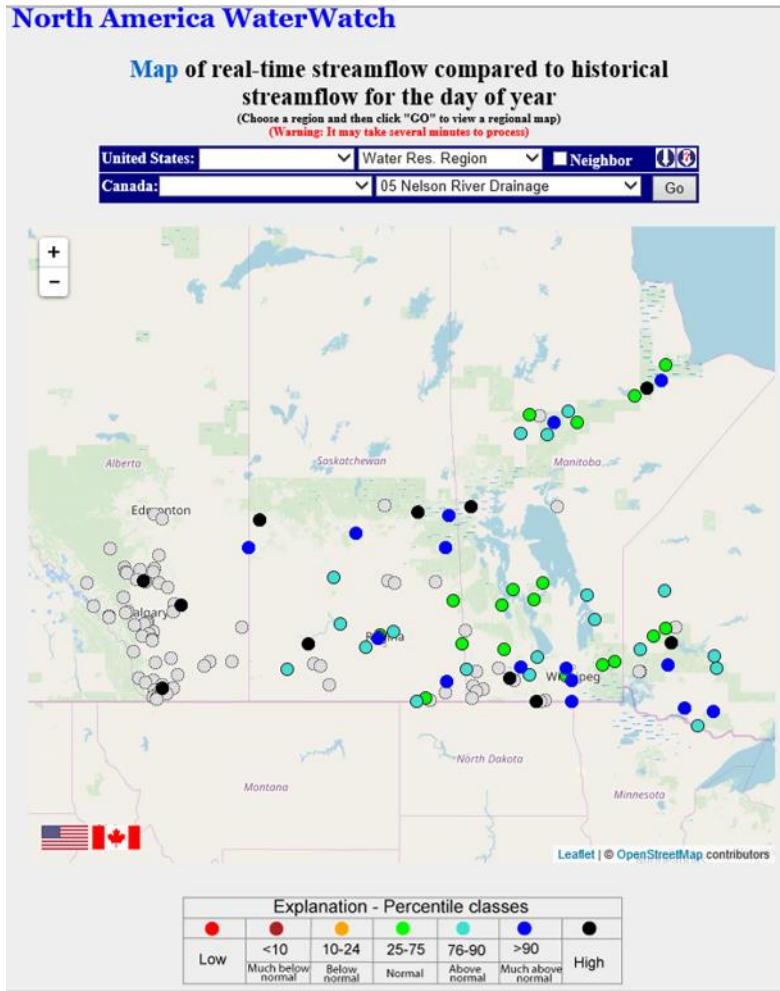


Figure 5. Base flow conditions as of January 28, 2020