

# Grand River Conservation Authority

**Report number:** GM-02-23-18

**Date:** February 24, 2023

**To:** Members of the Grand River Conservation Authority

**Subject:** Current Watershed Conditions as of February 14, 2023

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## **Recommendation:**

THAT Report Number GM-02-23-18 – Current Watershed Conditions as of February 14, 2023 be received as information.

## **Summary:**

January was a very warm and wet month. The month started with warm temperatures and rain and ended with cooler temperatures and snow. Cooler temperatures continued into early February and the snow began to form a snowpack that was near the long-term average in the north and below average in the south.

A large rain and melt event on February 9<sup>th</sup>, 2023, removed much of the snowpack and resulted in a rise in river levels from runoff. A watershed conditions statement was issued to promote safety around waterways and encourage residents to stay off of the ice.

With the early loss of the snowpack, the Shand and Conestogo reservoirs are being held closer to a late February level than a mid-February level at this time. The Guelph reservoir has almost recovered from dry conditions in 2022 and is close to its normal winter level. The amount of flood storage available over the next few months will be balanced with the amount of water in the snowpack and runoff expected from precipitation.

Lake Erie continues to be above the long-term average, but below levels in 2022. Lake Erie is mostly free of ice. The long term forecast over the next three months is for near normal precipitation and temperatures.

## **Report:**

### **Precipitation**

January precipitation was slightly above normal, with rain at the start and snow at the end of the month. At the Shand Dam climate station, slightly more snow than rain was recorded for the month. The February 1<sup>st</sup> snow survey showed that many of the northern parts of the watershed had a near average snowpack, while the southern parts of the watershed had a very light snowpack.

Precipitation over the first two weeks of February has been well above normal for the first half of the month, as shown in Table 1. February is normally a drier month, but there was a large rain event on February 9<sup>th</sup> which delivered over 35 millimeters of mixed precipitation to the upper parts of the watershed. Almost no snow has been recorded to date in February across the watershed and much of the January snowpack was lost to the melt event on February 9<sup>th</sup>. The next snow survey is scheduled for February 15<sup>th</sup>.

Trends in precipitation, Table 2, show that over the short term the watershed is showing signs of recovery from dry conditions in 2022, but over the long term the watershed is still in a precipitation deficit. In particular, over the past 6 and 12 months the watershed has averaged only 83 percent of normal precipitation. A prolonged period of at or above normal precipitation is

needed for the watershed to recover from the extended dry period in 2022. A visual representation of these trends for the Shand climate station is also given in Figure 1.

Table 1: Current monthly precipitation for climate stations across the watershed up to February 14, 2023 including the long term average precipitation for half of February.

Climate Station	Current Month Precipitation (millimeters)	Long Term Average Precipitation (millimeters)	Percentage of Long Term Average (%)
Shand	40.5	28.4	143%
Conestogo	51.4	32.9	156%
Guelph	38.2	27.4	139%
Luther	53.9	33.2	162%
Woolwich	40.7	28.8	141%
Laurel	41.5	29.8	139%
Shades	32.8	27.5	119%
Brantford	29.5	21.7	136%

Table 2: Precipitation trends as a percentage (%) of the long-term average over the last 18 months

Climate Station	Last Month	Last 3 Months	Last 6 Months	Last 12 Months	Last 18 Months
Shand	113%	96%	85%	89%	94%
Conestogo	91%	90%	89%	92%	96%
Guelph	126%	96%	85%	87%	95%
Luther	118%	114%	92%	94%	99%
Woolwich	93%	88%	80%	74%	87%
Laurel	100%	85%	72%	74%	93%
Shades	102%	90%	79%	78%	95%
Brantford	129%	86%	75%	82%	96%

### Air Temperatures

January was a very warm month. The average temperature during the month was approximately 4.5 degrees above the long-term average. At the Shand Dam climate station there were 20 days where temperatures reached above freezing. In southern parts of the watershed there were very few days where temperatures stayed below freezing.

The first week of February was cold in comparison to January. Temperatures were close to seasonal with overnight lows in the minus teens. Cold conditions were short lived and warm weather returned by the second week. The average temperatures at the Shand Dam climate station over the first two weeks of February was negative 2.3 degrees. This is approximately 2.3 degrees above the long-term average for the first half of February. Forecast temperatures over the next few days are for even warmer temperatures.

A visual representation of these trends for the Shand climate station is given in Figure 2.

### **Lake Erie Water Levels**

During January, the average lake level was approximately 0.29 meters above the long-term average. Levels increased during the first half of February and are approximately 0.38 meters above the long-term average. The forecast for Lake Erie is for lake levels to continue to increase over the spring months following regular seasonal patterns. Lake Erie is not ice covered. Figure 3 shows the range of water levels that is expected over the next six months as well as the observed water levels over the last three years.

### **Reservoir Conditions**

Runoff from the recent melt event is being routed through the reservoirs. With the early loss of the snowpack, the Shand and Conestogo reservoirs are being held closer to a late February level than a mid-February level at this time. The Guelph reservoir has almost recovered from dry conditions in 2022 and is close to its normal winter level.

Reservoirs will be used to manage flows during melt or rain events over the next couple of months. The amount of flood storage available will be balanced with the amount of water in the snowpack and runoff expected from precipitation. Year to date reservoir levels and operating rule curves are shown in Figures 4 and 5 for the four largest reservoirs.

### **Long Range Forecast**

Environment and Climate Change Canada is forecasting near normal temperatures and precipitation over the next 3 months.

### **Flood Preparedness and Flood Centre Activities**

One flood message was issued during the melt event on February 9<sup>th</sup>. The message focused on water safety given rising water levels and melting ice.

Staff continue to hold weekly meetings as part of planning initiatives, dam operations and flood emergency preparedness. Training sessions on the flood program and emergency management are underway for new staff and for staff in new roles.

The spring flood coordinators meeting is scheduled for February 22 and is planned to be a hybrid meeting with virtual and in person options. Staff will provide an overview of the flood response program and provide a look towards the spring 2023 forecast.

### **Financial Implications:**

Not applicable

### **Other Department Considerations:**

Not applicable

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## Figures:

Figure 1: Shand Dam Monthly Precipitation 2019 to February 14, 2023

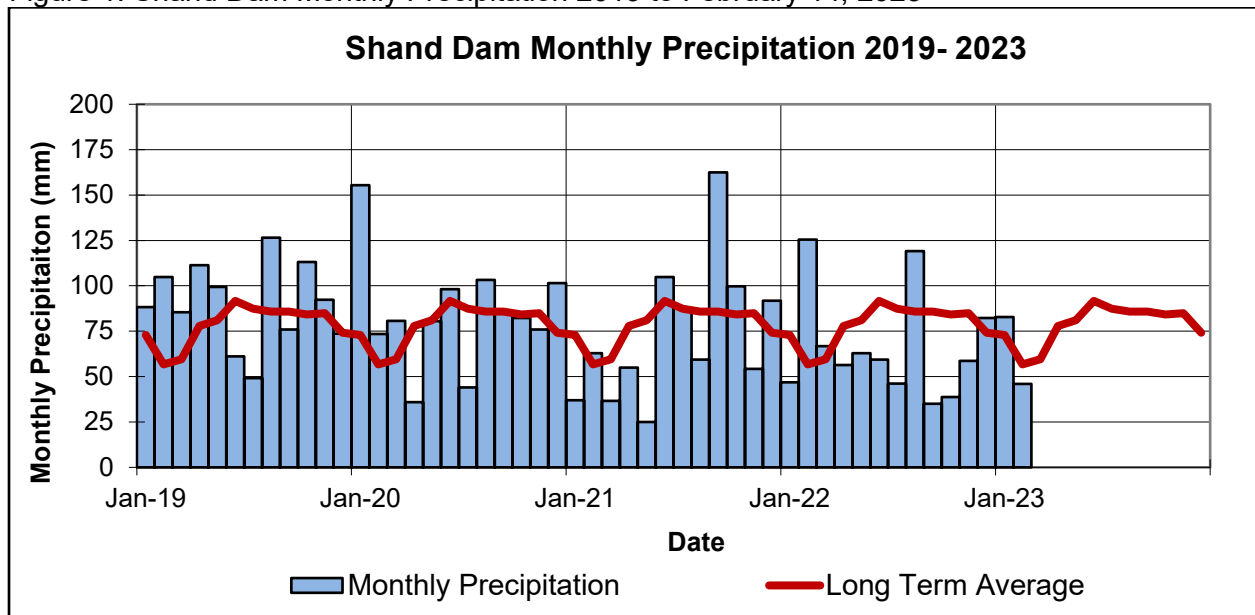


Figure 2: Monthly Average Air Temperatures at Shand Dam from 2019 to February 14, 2023

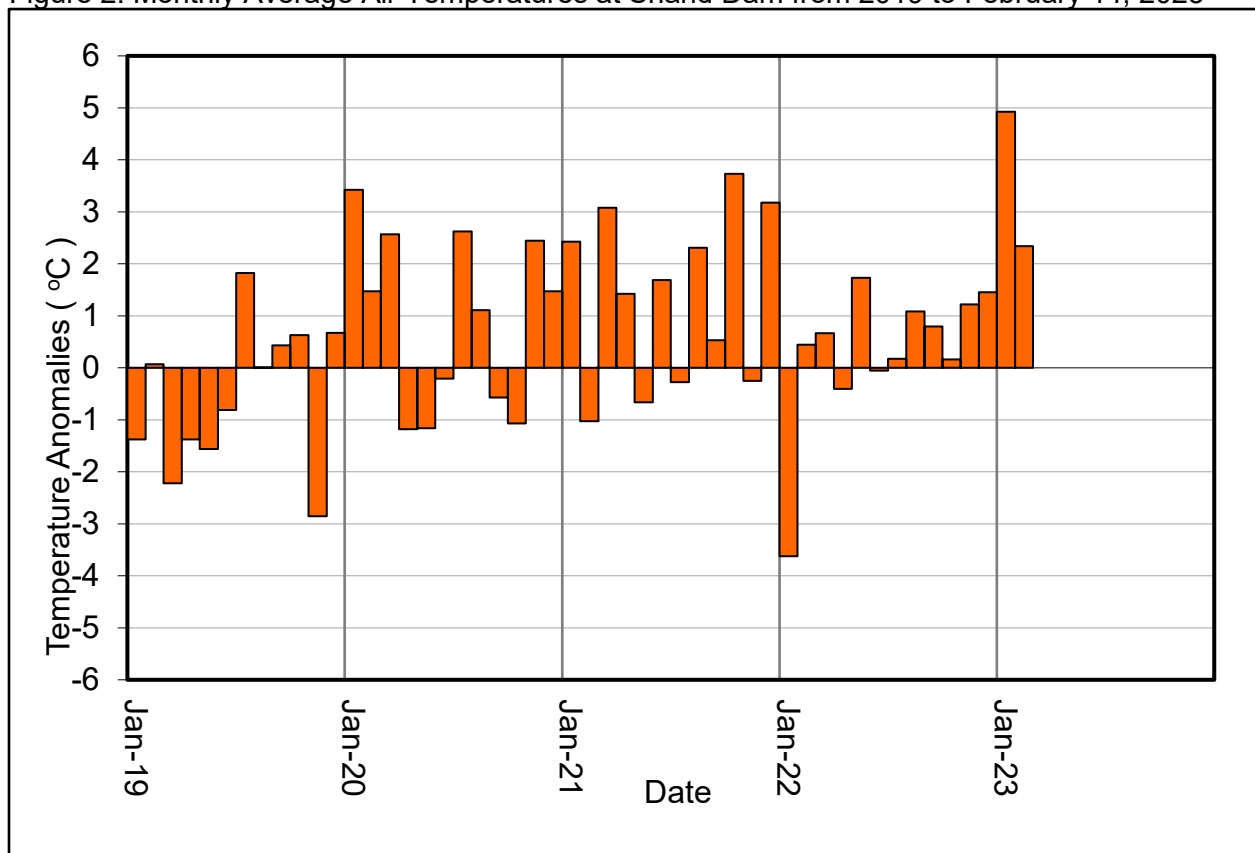


Figure 3: Water levels for Lake Erie at Port Colborne

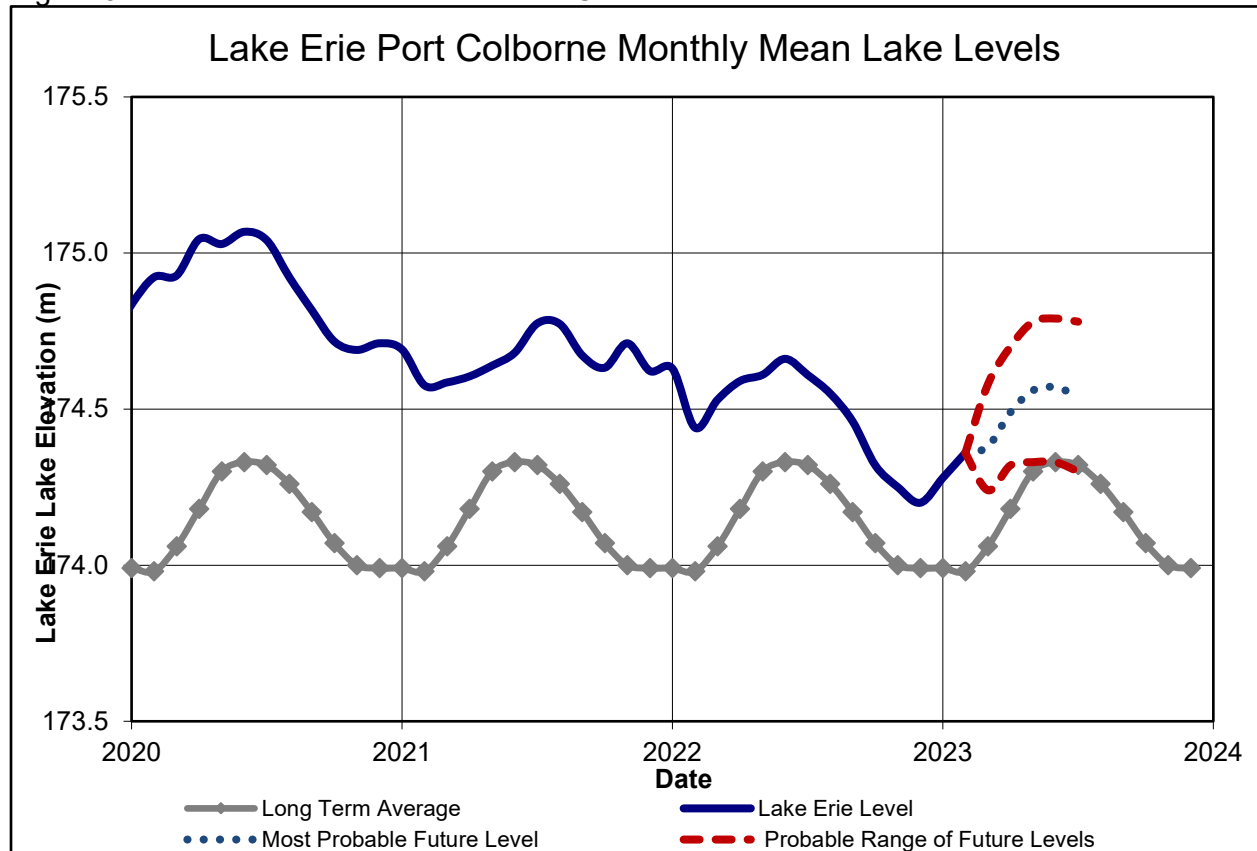
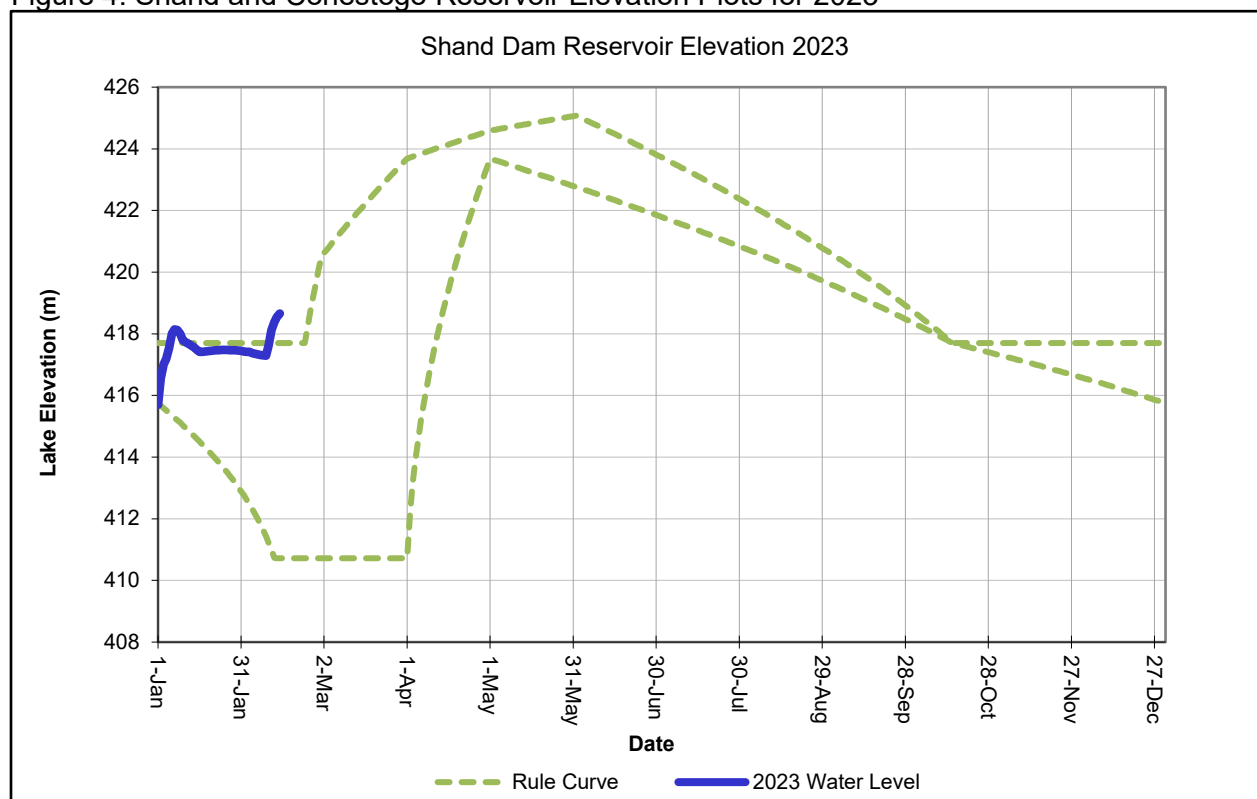


Figure 4: Shand and Conestogo Reservoir Elevation Plots for 2023



Conestogo Dam Reservoir Elevation 2023

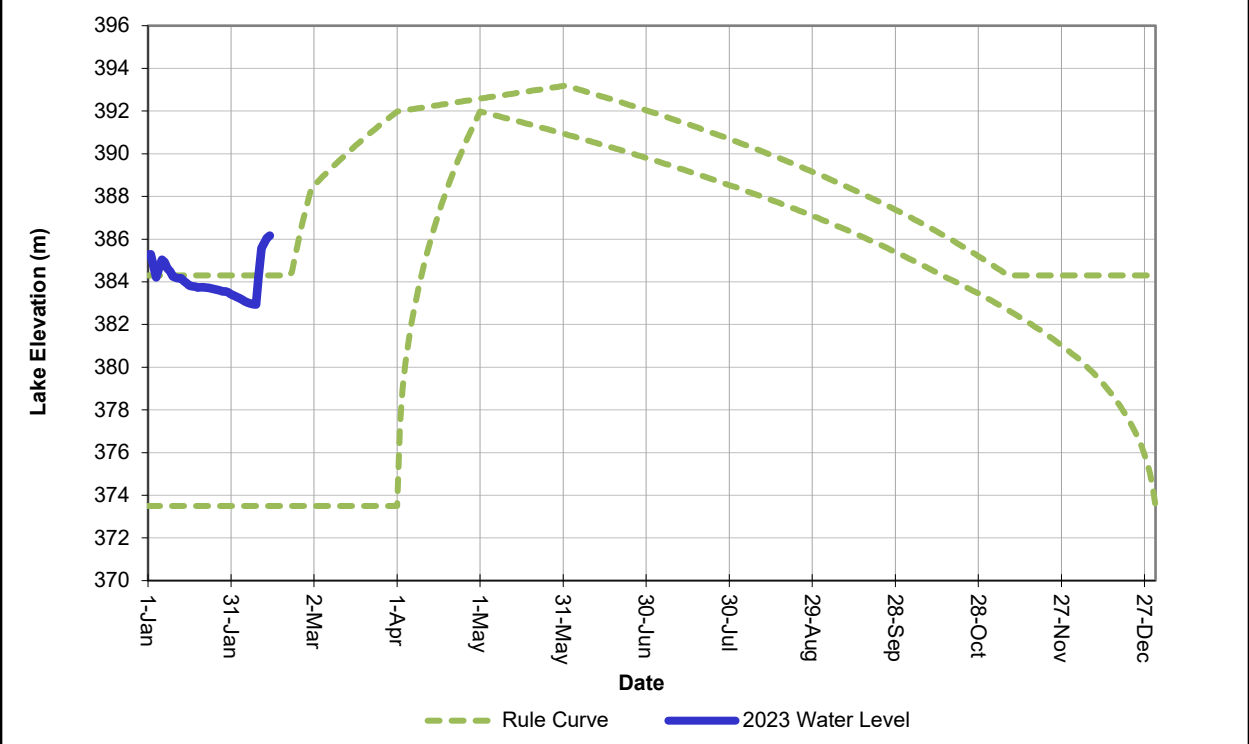


Figure 5: Guelph and Luther Reservoir Elevation Charts for 2023

