

# Grand River Conservation Authority

**Report number:** GM-06-22-57

**Date:** June 24, 2022

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

**Subject:** Current Watershed Conditions as of June 15, 2022

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## **Recommendation:**

THAT Report Number GM-06-22-57 – Current Watershed Conditions as of June 15, 2022 be received as information.

## **Summary:**

The first two weeks of June were variable with dry periods, heat waves, below seasonal temperatures, and rainy days. Overall to date, average temperatures were near normal and precipitation varied due to localized convective storms. May had variable precipitation and well above average temperatures. Overall precipitation over the last three months is well below normal due to a fairly dry April.

The large reservoirs are at normal operating levels for this time of the year and are being used for flow augmentation. Dry conditions in April and May resulted in an early start to the flow augmentation season with augmentation ramping up fairly early in May. Augmentation peaked early in June near to normal summer levels, but has since fallen by approximately half after a period of higher precipitation.

Lake Erie continues to be above the long-term average and is below level for this time last year. Levels have increased slightly over the last month and are expected to peak later this month or next month. The long-term forecast is for fairly normal conditions over the next three months.

## **Report:**

### **Precipitation**

Precipitation varied across the watershed in May. Some areas received high amounts of rain as part of convective storm systems, while other areas had below normal precipitation. The lowest amount of precipitation was recorded at Shades Mill Dam in Cambridge with only 55mm. Luther Dam also recorded low amounts with 59mm. Conestogo Dam had the highest amount of rainfall with 102mm. Some of the convective storms were so localized they missed the rain gauge network altogether.

Precipitation up to June 15 has also varied across the watershed. There was more precipitation in the northern parts of the watershed and less in the central part. Table 1 shows the precipitation for watershed climate stations against the long term average. Luther Dam received the most precipitation with 132% of average for the first half of the month, while Shades received the least with only 83% of the average for the same period.

Table 1: Current monthly precipitation for climate stations across the watershed up to June 15, 2022 including the long term average precipitation for half of June.

Climate Station	Current Month Precipitation (mm)	Long Term Average Precipitation (mm)	Percentage of Long Term Average (%)
Shand	55.6	45.8	121%
Conestogo	54.0	47.2	114%
Guelph	48.1	43.6	110%
Luther	60.6	45.9	132%
Woolwich	34.4	38.2	90%
Laurel	42.2	43.4	97%
Shades	35.0	42.4	83%
Brantford	36.5	33.1	110%

Dry conditions in April combined with slightly below normal precipitation in some areas in May and March resulted in below normal precipitation over the last three months for all stations except Conestogo. There is still variability in the precipitation trends over the last 18 months due to uneven precipitation in 2021, shown in Table 2. A visual representation of these trends for the Shand climate station is also given in Figure 1.

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	78%	85%	107%	108%	98%
Conestogo	114%	106%	104%	111%	98%
Guelph	126%	97%	106%	121%	110%
Luther	67%	81%	101%	108%	102%
Woolwich	119%	89%	106%	97%	87%
Laurel	88%	80%	98%	119%	105%
Shades	69%	71%	90%	118%	111%
Brantford	108%	91%	100%	117%	105%

## Air Temperatures

May was a hot month. The average monthly temperature was 14.2 degrees at Shand Dam, which is about 1.7 degrees above the long term average. There was a period of approximately 5 days mid-month with daytime high temperatures near or at 30 degrees across the watershed. The end of the month saw the first heat warning of the year with temperatures over 30 degrees.

The average temperature in the first half of June was near seasonal. After the heat wave at the start of the month, temperatures dropped to below seasonal for over a week before increasing back to seasonal by the middle of the month. As of June 15<sup>th</sup> another heat wave had returned to the watershed with predicted daytime highs over 30 degrees.

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

## **Lake Erie Water Levels**

During May, the average lake level was approximately 0.31m above the long-term average, which was approximately 0.03m below the same month in 2021. Lake levels have increased slightly over the last month. In the first half of June, the average lake level was approximately 174.66m, which is about 0.33m above the long-term average.

Lake Erie levels are expected to remain slightly below levels for this time last year, but stay above the long term average through the remainder of the year. Figure 3 shows the range of water levels that is expected over the next six months. A High Lake Level Conditions Statements remains in effect.

## **Reservoir Conditions**

The large reservoirs are at normal operating levels for this time of the year and are being used to augment flows downstream.

Dry conditions in April and May resulted in an early start to the flow augmentation season with augmentation ramping up fairly early in May. In early June, augmentation peaked with approximately 60% of the water in the Grand River through Kitchener, 25% of the water in the Grand River through Brantford and 30% of the water in the Speed River below Guelph from water stored in the reservoirs. Rain received mid-month reduced the need for augmentation by about half of what it was at the peak by the middle of the month.

The 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 above normal temperatures and near normal precipitation for the June to August period. While the Weather Network summer forecast is also for above normal temperatures, but also for above normal precipitation. The Weather Network forecast is for a hot and humid summer with the potential for storms.

The long range forecast provided by the Surface Water Monitoring Centre was for a summer much like 2021. Some months will see warmer than normal temperatures while others will be near normal. Precipitation is forecast to vary month to month, but overall be close to normal.

## **Flood Preparedness**

Conditions are being monitored closely. Staff continue to hold weekly meetings as part of overall succession planning initiatives, dam operations and flood emergency preparedness.

A meeting will be arranged with Community Emergency Management Coordinators (CEMC's) from across the watershed to introduce the new Director of Water Management and to discuss emergency preparedness planning for flood events.

The provincial ministry of Northern Development, Mines, Natural Resources and Forestry has prepared updated Provincial Flood Forecasting and Warning guidelines. Staff have contributed comments and participated in these preparation of these guidelines. It's expected these new guidelines will be approved for use later this year. There are no substantive changes in roles and responsibilities.

## **Financial Implications:**

Not applicable

## **Other Department Considerations:**

Not applicable

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## Figures:

Figure 1: Shand Dam Monthly Precipitation 2018 to June 15, 2022

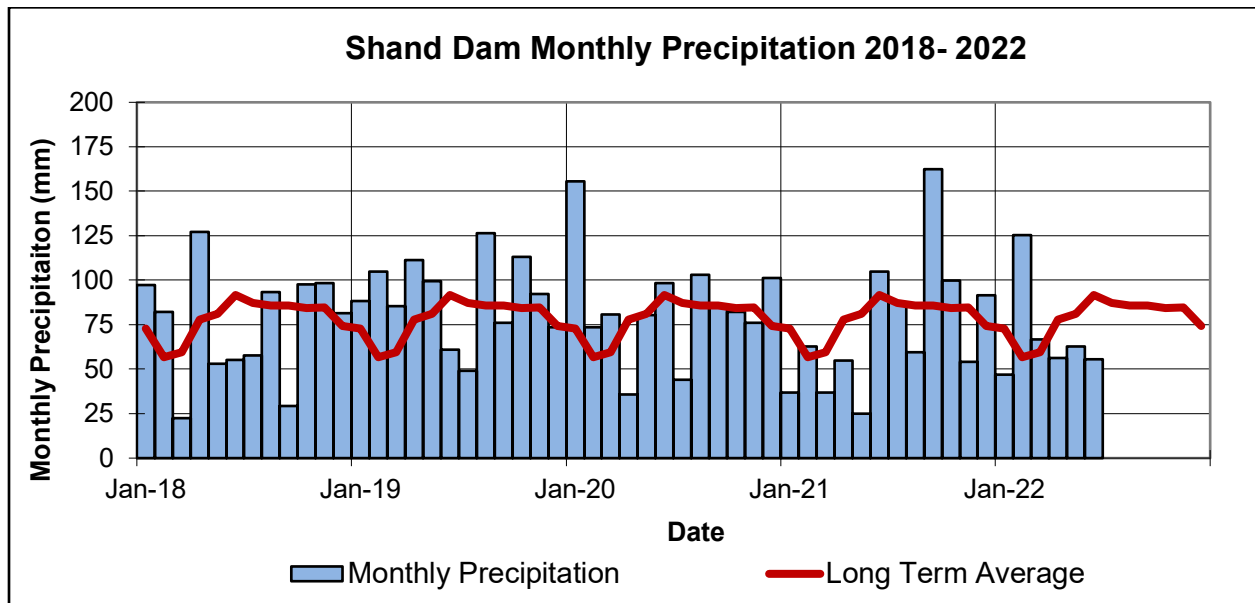


Figure 2: Monthly Average Air Temperatures at Shand Dam from 2018 to June 15, 2021

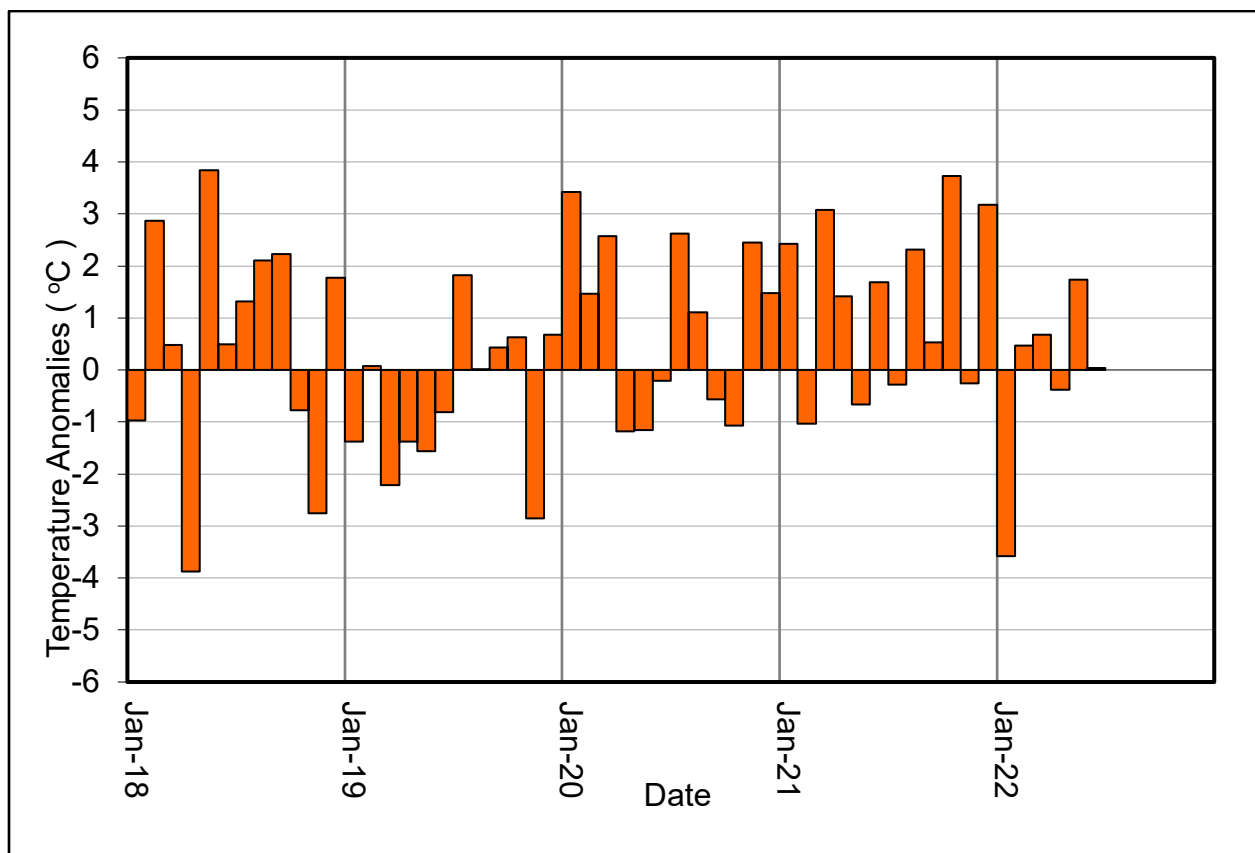


Figure 3: Water levels for Lake Erie at Port Colborne

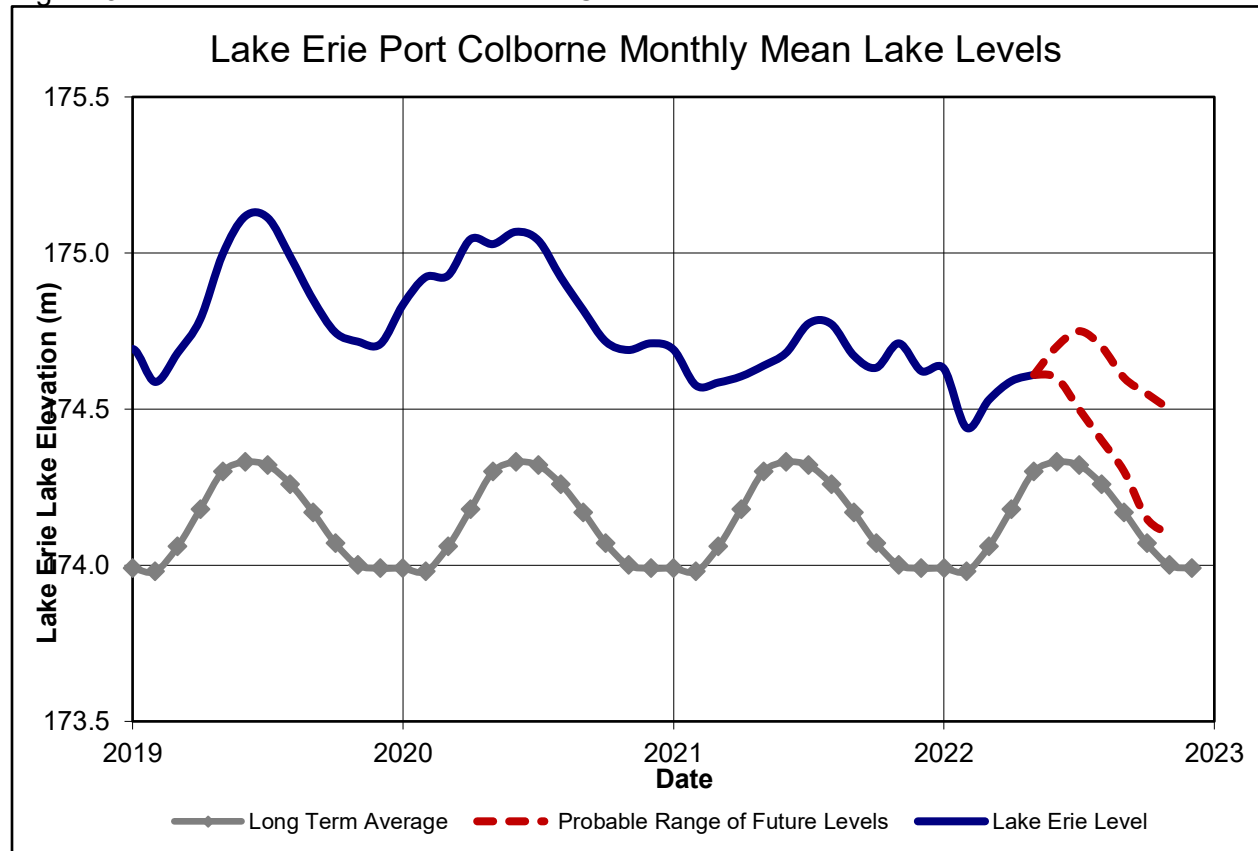


Figure 4: Shand and Conestogo Reservoir Elevation Plots for 2022

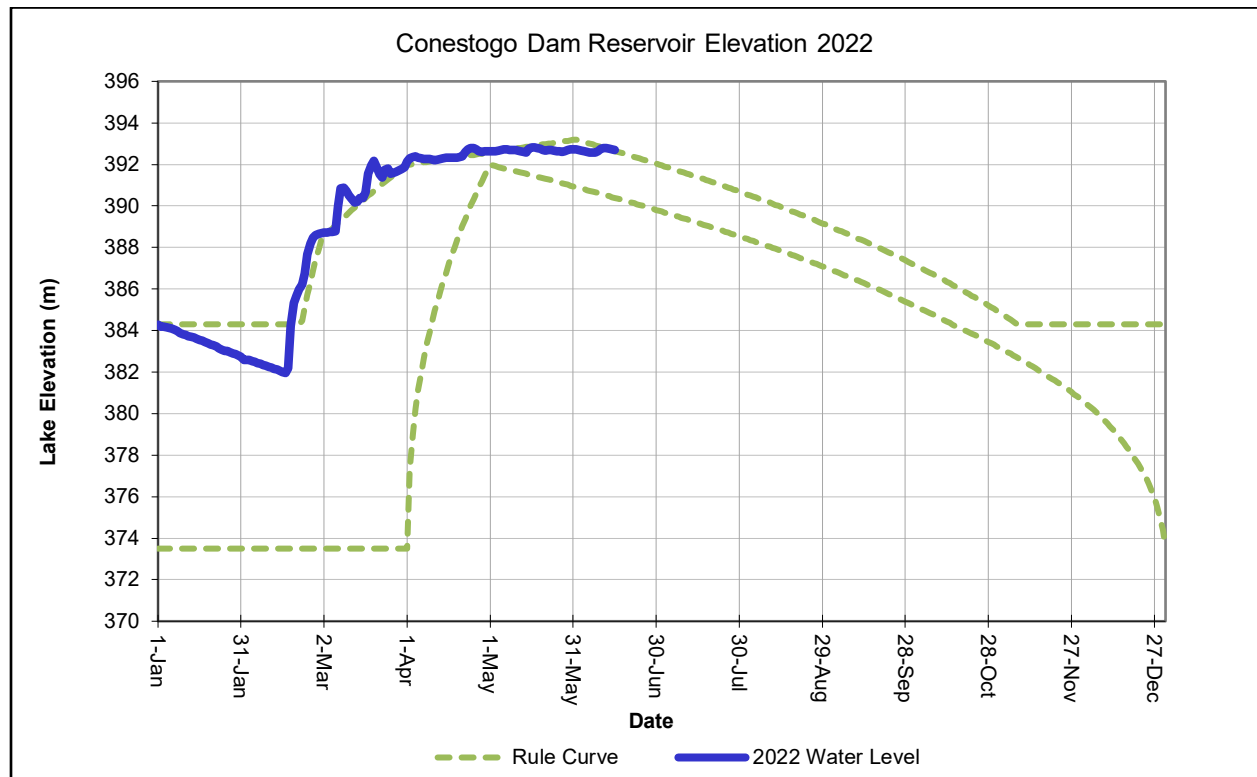
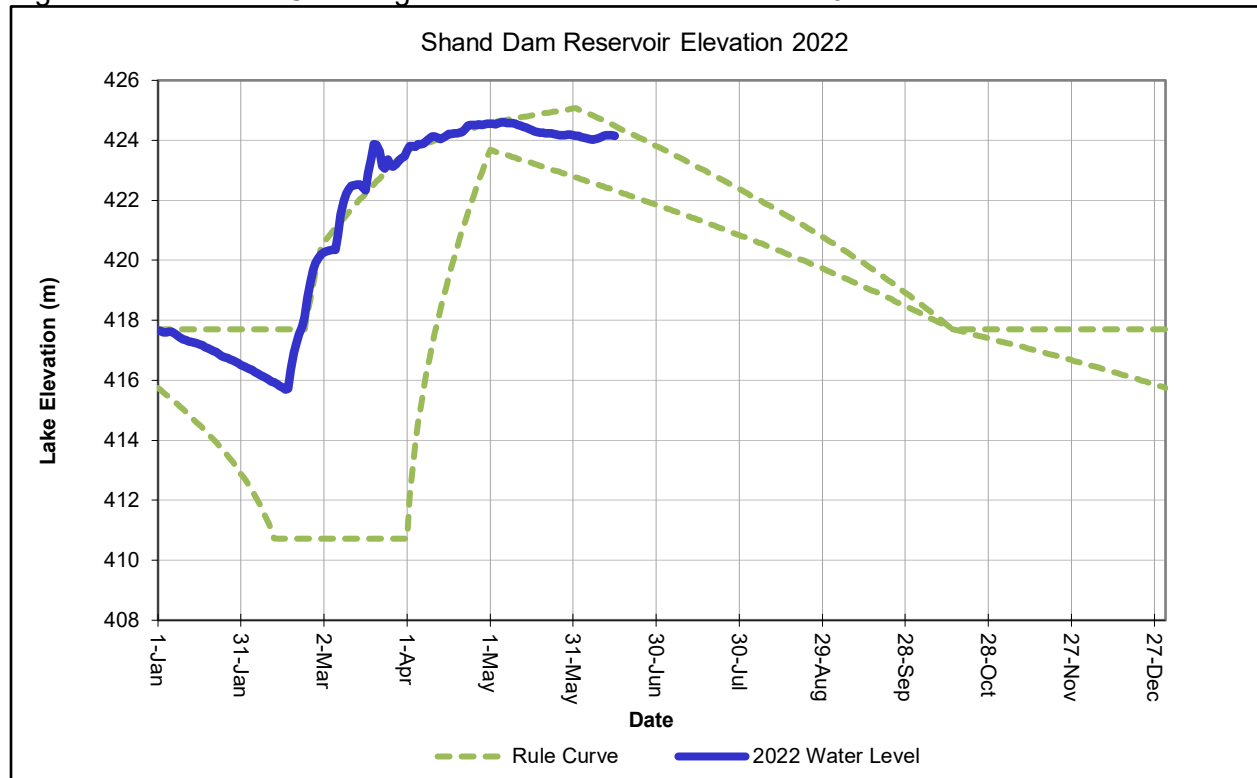


Figure 5: Guelph and Luther Reservoir Elevation Charts for 2022

