

Grand River Conservation Authority

Report number: GM-09-28-85

Date: September 27, 2024

To: Members of the Grand River Conservation Authority

Subject: Current Watershed Conditions as of September 17, 2024

Recommendation:

THAT Report Number GM-09-28-85 – Current Watershed Conditions as of September 17, 2024 be received as information.

Summary:

Precipitation in August was below average overall with amounts varying across the watershed. On average, the stations have only received about 9 percent of the long-term average precipitation for half of September so far. As of September 17, 3-month indicators for precipitation are still showing above average conditions at all 8 climate stations.

Recorded temperatures in August at Shand, Luther, Shades, and Environment and Climate Change Canada's Brantford Airport climate (Brantford) stations, show that the average temperature across the watershed was around 0.2 degrees Celsius warmer than the long-term average. The temperature during the first 17 days of September at the Shand Dam climate station was only about 0.1 degrees Celsius cooler than the long-term average for the first half of September.

Reservoirs are at their normal operating levels for this time of year except for Conestogo, which has been drawn down to accommodate concrete rehabilitation on the upstream side of the dam.

The large reservoirs are being used to meet downstream low flow targets.

Lake Erie continues to be above the long-term average.

The seasonal forecast over the next three months is for above normal temperatures and below normal precipitation.

Report:

Precipitation

In August, below average rainfall amounts were received across the watershed. Amounts varied, with the Shades station recording over 100 mm of rain and the Brantford and Conestogo stations each only recording around 40 mm.

The first 17 days of September have been dry with recorded precipitation ranging from 1 to 24 percent of the long-term average for half of the month of September at climate stations across the watershed, as shown in Table 1.

Trends in precipitation, as presented in Table 2, show that during the past 3 months, the watershed has experienced slightly wetter than normal conditions on average. Precipitation amounts ranged from around 84 percent at the Conestogo climate station to 141 percent at the Brantford station with an overall average of around 111 percent. Over longer periods, recorded precipitation is above normal long-term averages overall. A visual representation of these trends for the Shand climate station is provided in Figure 1.

Table 1: Current monthly precipitation for climate stations across the watershed up to the morning of September 17, 2024.

Climate Station	Current Month Precipitation (mm)	Long Term Average Precipitation (mm)	Percentage of Long-Term Average (%)
Shand	7.1	42.9	17%
Conestogo	11.0	45.5	24%
Guelph	2.6	41.5	6%
Luther	5.7	47.8	12%
Woolwich	0.2	33.9	1%
Laurel	2.4	47.5	5%
Shades	2.2	43.3	5%
Brantford	2.2	38.5	6%

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	73%	110%	125%	107%	113%
Conestogo	46%	84%	109%	94%	105%
Guelph	65%	107%	121%	102%	111%
Luther	82%	104%	123%	103%	112%
Woolwich	75%	105%	115%	97%	102%
Laurel	84%	108%	113%	94%	101%
Shades	141%	130%	130%	107%	118%
Brantford	58%	141%	128%	110%	118%

Air Temperatures

Recorded temperatures in August at Shand and Shades were slightly warm at around 0.4 and 1.3 degrees Celsius higher than the long-term average, respectively. Temperatures at Luther and Brantford were slightly cooler than their long-term averages.

The average temperature at the Shand Dam climate station over the first 17 days of September was 16.6 degrees Celsius which is close to the long-term average for the first half of the month of September. A visual representation of these trends for the Shand climate station is provided in Figure 2.

Lake Erie Water Levels

During August, the average lake level was approximately 0.30 meters above the long-term average. As of September 15, levels are 0.12 m lower than August and approximately 0.27 meters above the long-term average and 0.1 meters below September 2023.

The most probable forecast for Lake Erie is for lake levels to remain above the long-term average for the remainder of the year. Figure 3 shows the observed water levels starting in 2021 as well as the range of water levels expected over the next six months.

Reservoir Conditions

The large reservoirs are being used to meet downstream flow targets. Recent dry conditions mean that reservoirs are more heavily relied upon to augment flows downstream. Shand, Luther, and Guelph reservoirs are at their normal operating levels for this time of year.

GRCA is undertaking concrete rehabilitation work on the upstream (reservoir facing) side of Conestogo dam which is continuing into the fall of 2024 and again in the summer/fall of 2025. To accommodate this concrete work, water in the Conestogo Lake reservoir has been drawn down below the lower rule curve.

There is 60 and 79 percent available storage at Shand and Conestogo, respectively. Year to date reservoir levels and operating rule curves are shown in Figures 4 and 5 for the four largest reservoirs.

Low Water Response

The watershed remains in normal condition based on the 3-month indicators. With current dry conditions in mind, precipitation and streamflow data will continue to be monitored closely along with groundwater level data.

Long Range Forecast

Environment and Climate Change Canada is forecasting above normal temperatures and below normal precipitation for the watershed over the 3 months of September, October, and November.

Flood Preparedness and Flood Centre Activities

The GRCA flood operations centre did not issue any flood messages in August or September, so far.

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

Training sessions for dam operators and field staff will be conducted as needed.

Financial Implications:

Not applicable

Other Department Considerations:

Not applicable

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Figure 1: Shand Dam Monthly Precipitation 2020 to morning of September 17, 2024

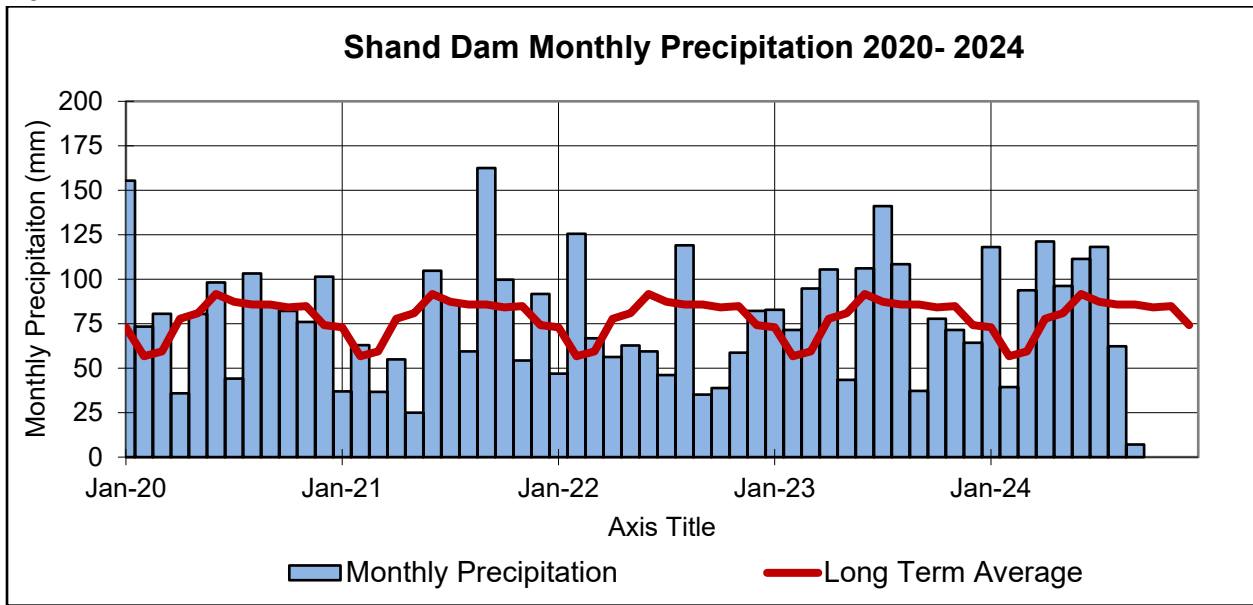


Figure 2: Monthly Average Air Temperatures at Shand Dam from 2020 to September 17, 2024

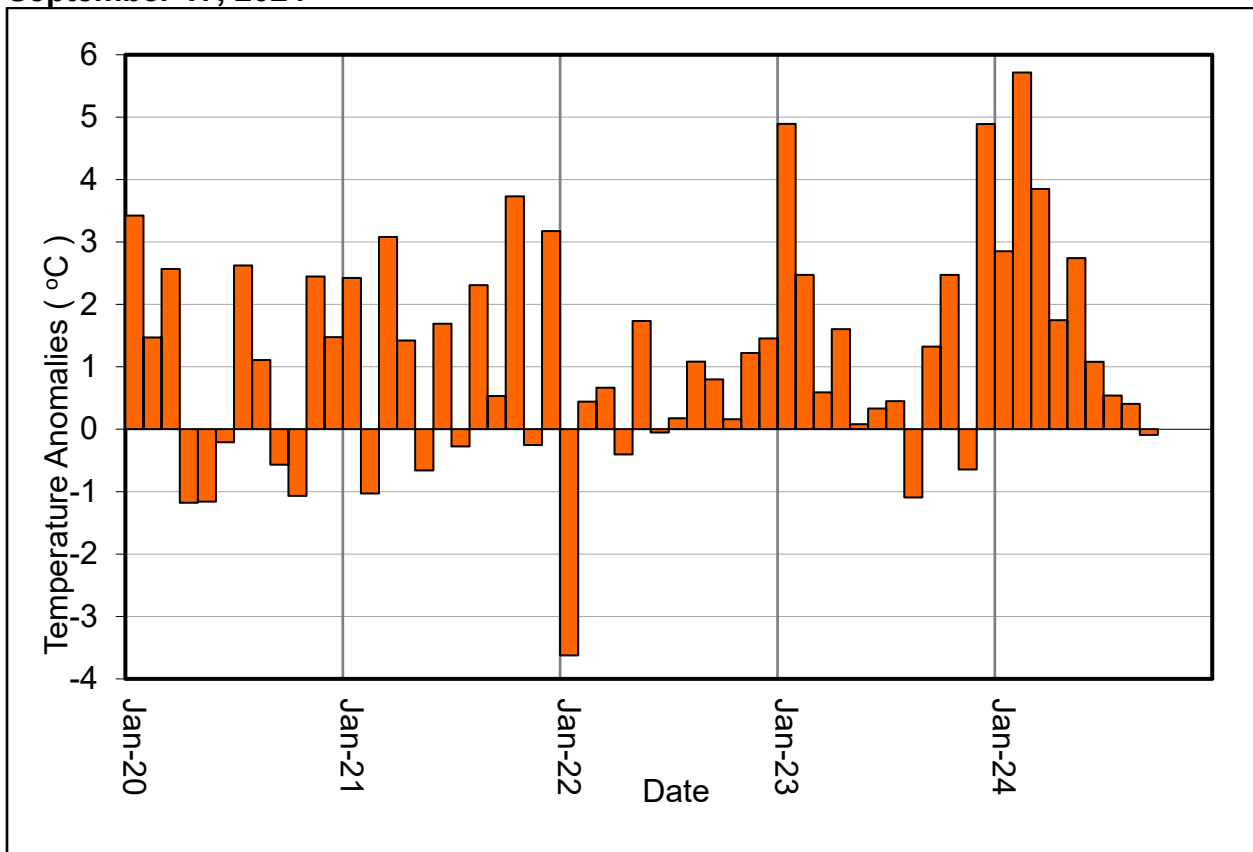


Figure 3: Water levels for Lake Erie at Port Colborne

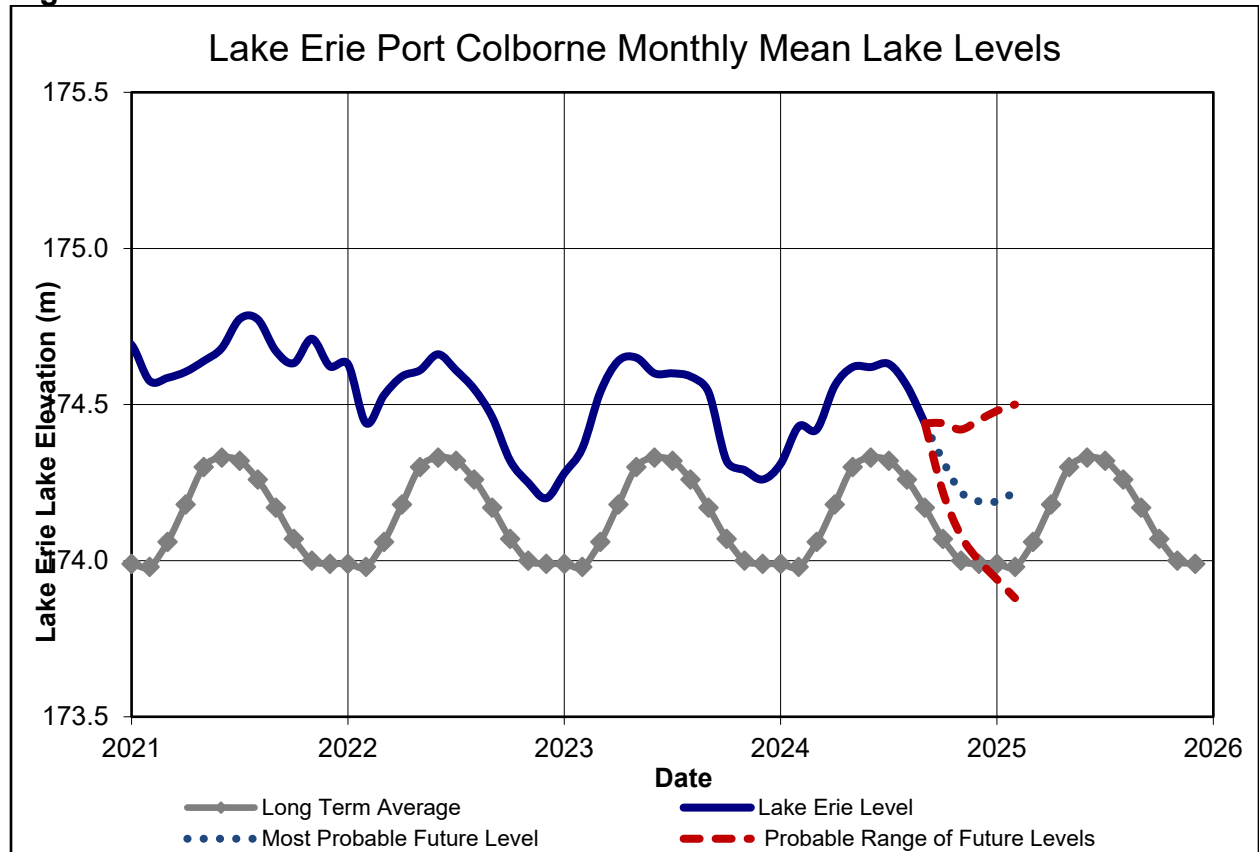


Figure 4: Shand and Conestogo Reservoir Elevation Plots for 2024

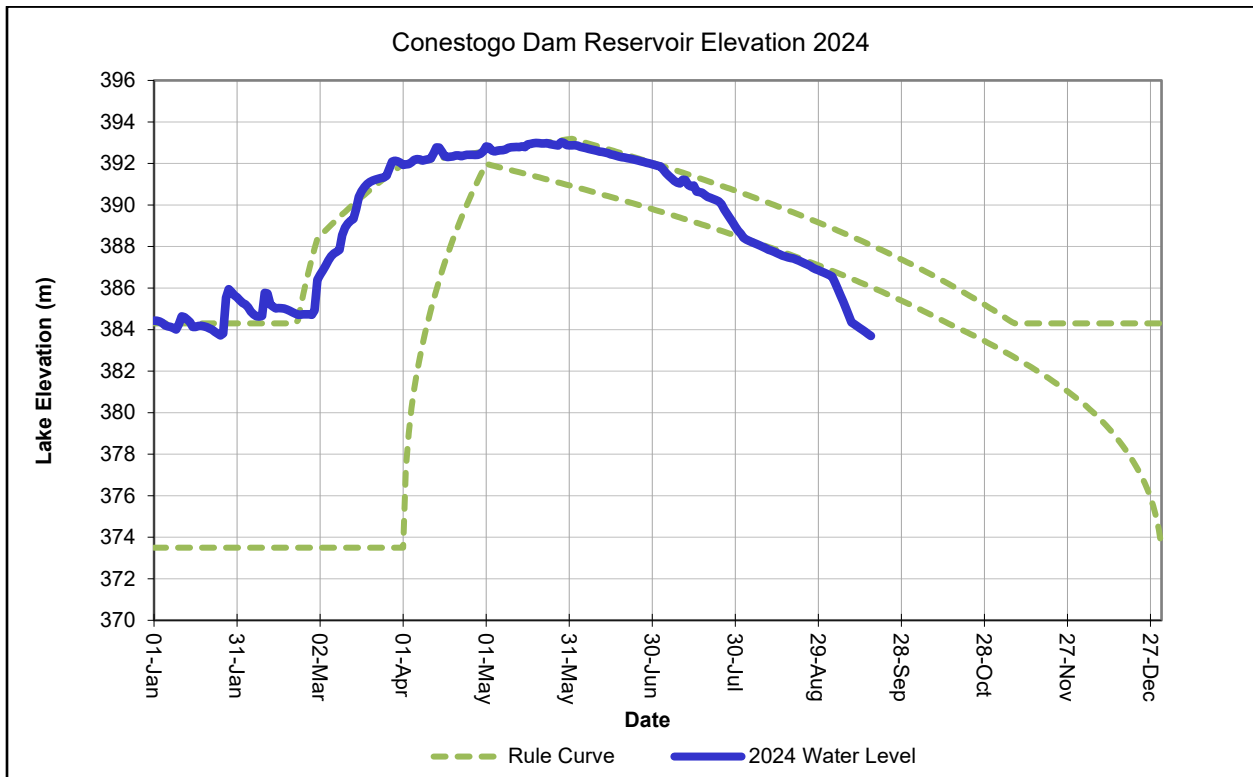
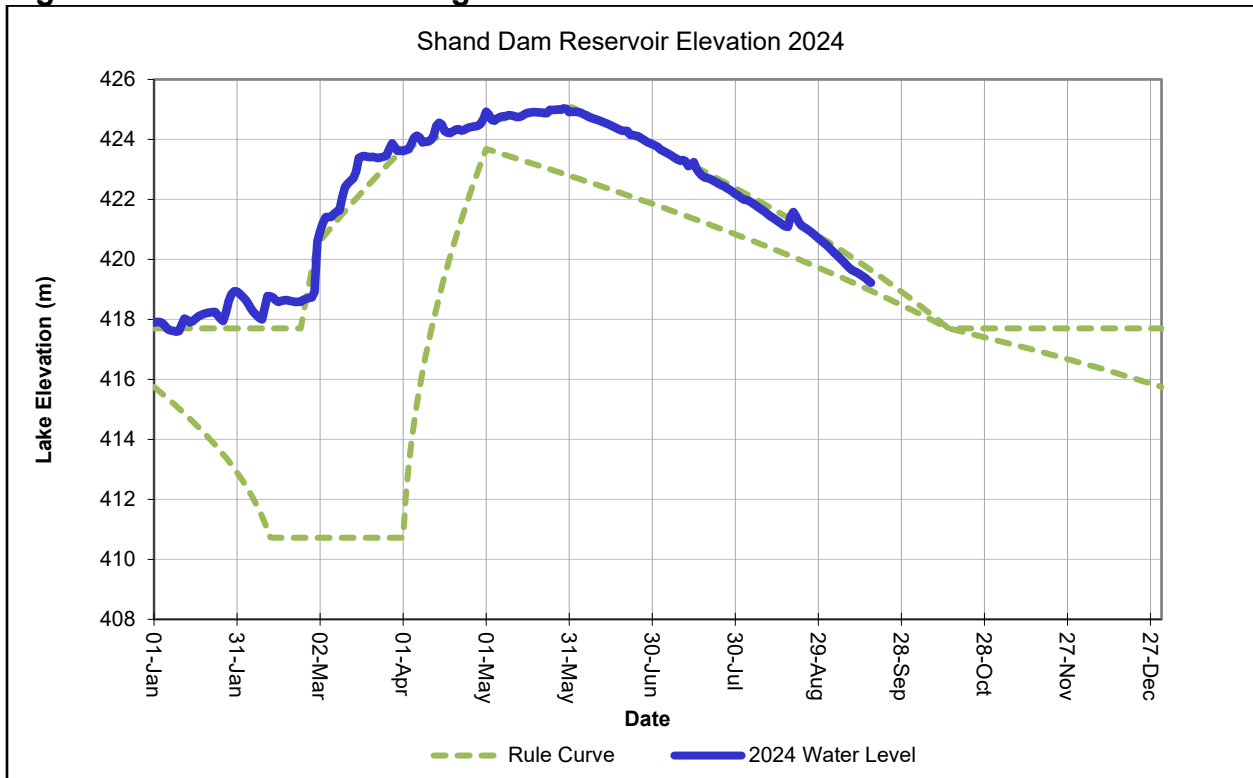


Figure 5: Guelph and Luther Reservoir Elevation Charts for 2024

