

Grand River Conservation Authority

Report number: GM-11-24-108

Date: November 22, 2024

To: Members of the Grand River Conservation Authority

Subject: Current Watershed Conditions as of October 15, 2024

Recommendation:

THAT Report Number GM-11-24-108 – Current Watershed Conditions as of November 12, 2024 be received as information.

Summary:

Precipitation in October was below average across the watershed. On average, the stations have only received about 51 percent of the long-term normal precipitation for half of November so far. As of November 12, 3-month indicators for precipitation are showing below normal conditions at all 8 climate stations.

Recorded temperatures in October 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 1.6 degrees Celsius warmer than normal. The temperature during the first 12 days of November at the Shand Dam climate station was around 4 degrees Celsius warmer than the long-term average for the first half of November.

Guelph Dam and Luther Dam are at their normal operating levels for this time of year and Shand Dam and Conestogo Dam have been drawn down to accommodate rehabilitation work.

The large reservoirs will continue to serve their primary functions of flood storage and low flow augmentation, however there may be some deviation from the low flow target at Doon in November and December because of the rehabilitation work at Shand and Conestogo Dams.

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

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

Report:

Precipitation

The watershed received below normal rainfall in October.

In the first 12 days of November, recorded precipitation ranged from 32 to 68 percent of the long-term average for half of the month of November at climate stations across the watershed. Data is shown in Table 1.

Trends in precipitation, as presented in Table 2, show that during the past 3 months, the watershed has experienced drier than normal conditions. Precipitation amounts ranged from around 40 percent at the Conestogo climate station to 70 percent at the Shades station with an overall average of around 51 percent. Over longer periods recorded precipitation is still close to 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 November 12, 2024.

Climate Station	Current Month Precipitation (mm)	Long Term Average Precipitation (mm)	Percentage of Long-Term Average (%)
Shand	28.8	42.4	68%
Conestogo	28.4	47.6	60%
Guelph	18.4	40.2	46%
Luther	27.5	46.2	59%
Woolwich	18.8	34.8	54%
Laurel	18.4	41.8	44%
Shades	16.6	38.9	43%
Brantford	11.8	36.8	32%

Table 2: Precipitation trends as a percentage (% percent) 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	37%	51%	88%	102%	101%
Conestogo	42%	40%	72%	90%	93%
Guelph	32%	45%	86%	100%	99%
Luther	64%	56%	88%	101%	101%
Woolwich	42%	47%	82%	92%	97%
Laurel	42%	51%	84%	90%	89%
Shades	44%	70%	99%	105%	106%
Brantford	46%	45%	104%	109%	102%

Air Temperatures

Recorded temperatures in October at Luther, Shand, Shades, and Brantford were around 1.6 degrees Celsius higher than the long-term average at the stations, overall.

The average temperature at the Shand Dam climate station over the first 12 days of November was 7.6 degrees Celsius which is around 4 degrees warmer than the long-term average for the first half of the month of November. During the same period, temperatures at Luther, Shand, and Brantford were also above their respective long-term averages, ranging from 4.6 degrees Celsius recorded at Shades to 5.2 degrees Celsius at Luther. A visual representation of these trends for the Shand climate station is provided in Figure 2.

Lake Erie Water Levels

During October, the average lake level was around 0.24 metres above the long-term average. As of November 12, levels continued to follow a seasonal decline but remain above the long-term average.

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. Dry conditions this fall mean that reservoirs are continuing to be more heavily relied upon to augment flows downstream. Luther and Guelph reservoirs are at their normal operating levels for this time of year.

The Grand River Conservation Authority (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, and levels are expected to continue to drop over the next month to continue the concrete rehabilitation. Water levels will be managed to try to minimize any further decreases and if possible, water will be taken into storage to stabilize or increase the reservoir level.

The GRCA is also preparing for a maintenance project on Shand Dam. To accommodate the work, water in the Belwood reservoir has been lowered below the gates, which is below the lower rule curve for this time of year. The dam will continue to operate as intended throughout the duration of the project and provide its primary flood storage and flow augmentation functions. Water levels will be managed to try to minimize any further decreases and if possible, water will be taken into storage to stabilize or increase the reservoir level.

Reservoir operations at other GRCA dams may be adjusted to accommodate the maintenance drawdowns at Shand and Conestogo and to augment low flow as much as possible. The concrete rehabilitation projects may result in a deviation from the low flow target at Doon in November or December. The impact of deviating from the low flow target will be mitigated by lower water temperatures at this time of year and significant impacts on water quality are not anticipated.

There is 85 and 96 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 has received below average rain since August, leading to precipitation and stream flow indicators declining below the threshold for low water conditions in some areas.

Considering seasonal water use trends, the Grand River Low Water Response Team decided to maintain a normal low water condition at the time of the Grand River Low Water Response Team meeting on September 27, 2024.

However, precipitation and streamflow data will continue to be monitored along with groundwater level data and the GRCA will coordinate meetings with the Low Water Response Team to review conditions as a group, as needed.

Long Range Forecast

Environment and Climate Change Canada is forecasting above normal temperatures and above normal precipitation for the watershed over the 3 months of November to December 2024 and January 2025.

Flood Preparedness and Flood Centre Activities

The GRCA flood operations centre did not issue any flood messages in October or November, 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 November 12, 2024

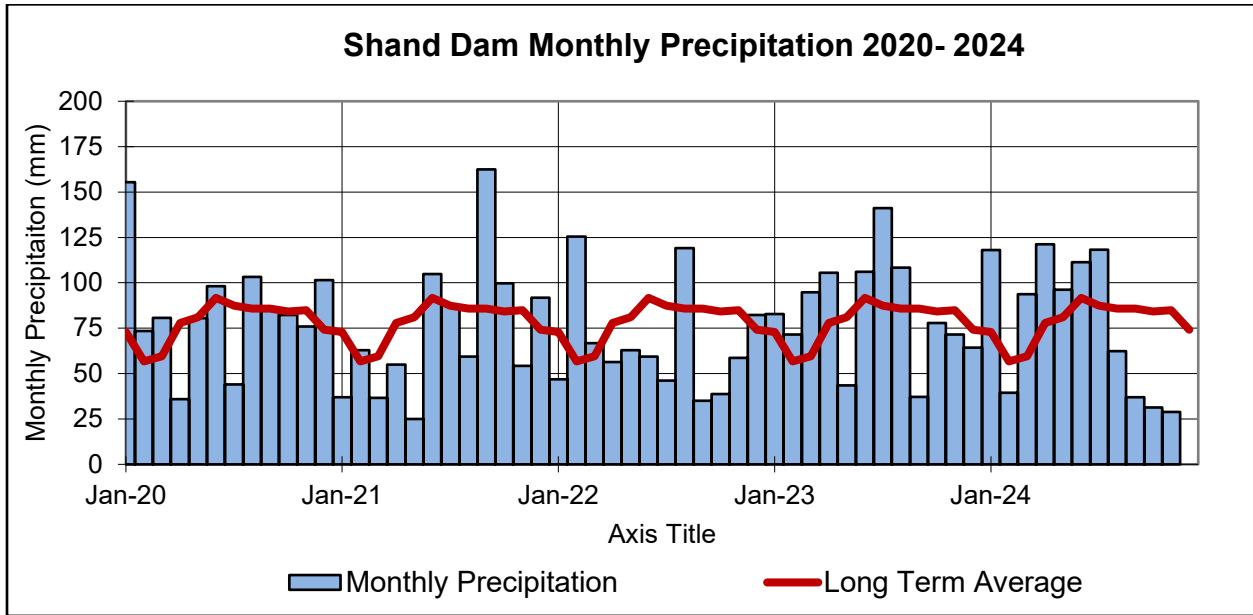


Figure 2: Monthly Average Air Temperatures at Shand Dam from 2020 to November 12, 2024

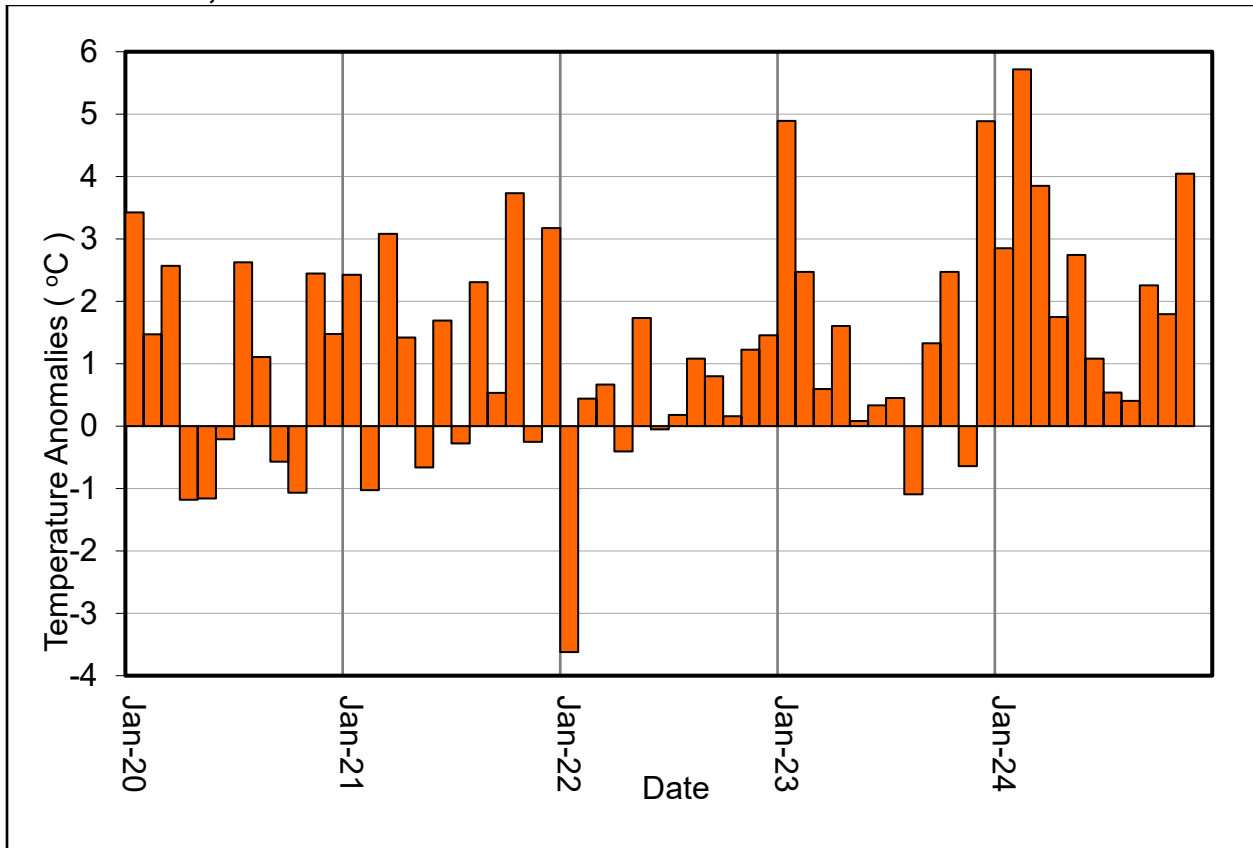


Figure 3: Water levels for Lake Erie at Port Colborne

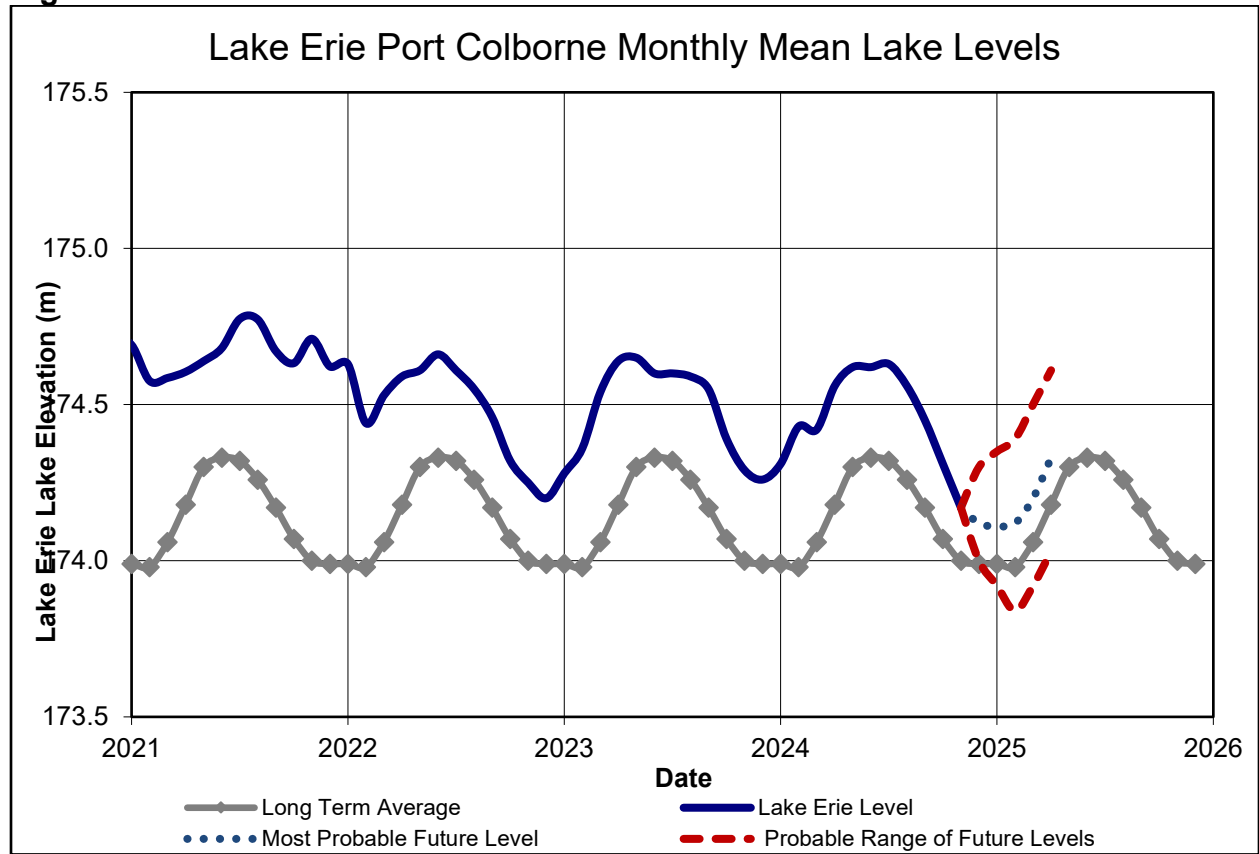


Figure 4: Shand and Conestogo Reservoir Elevation Plots for 2024

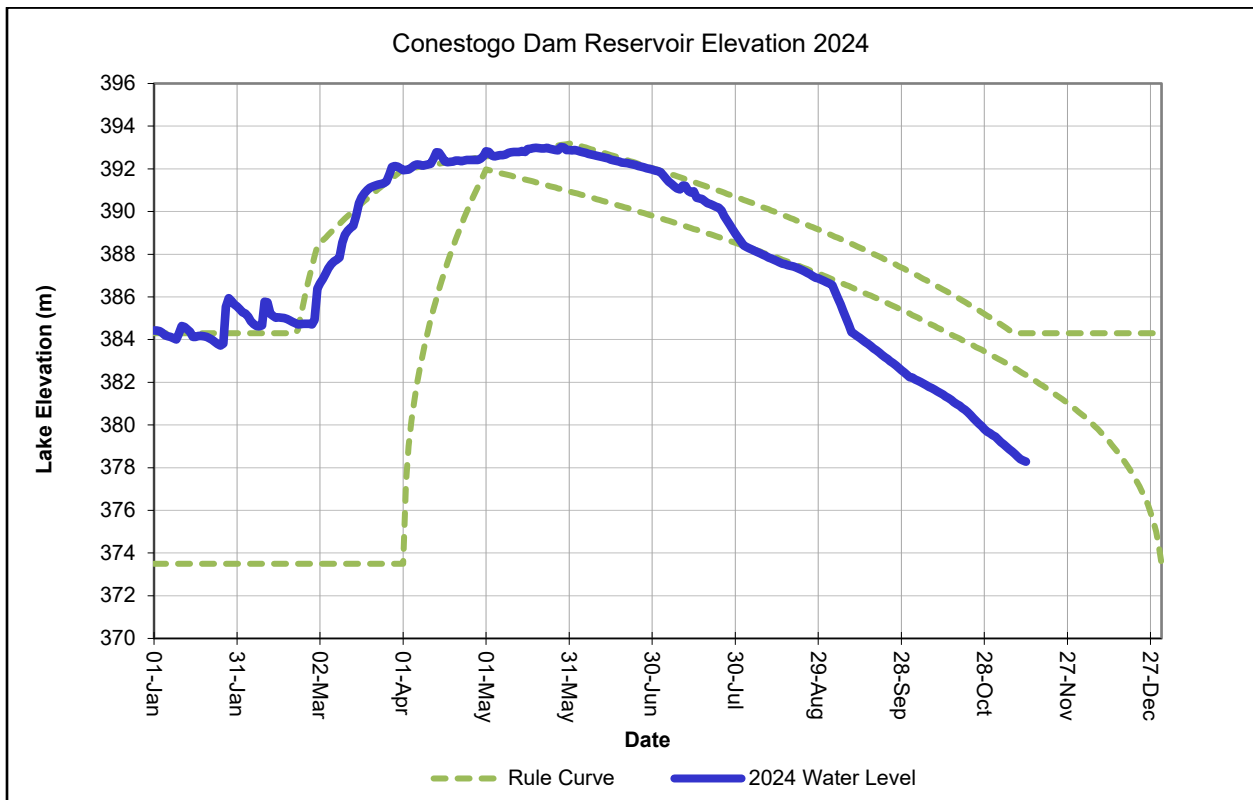
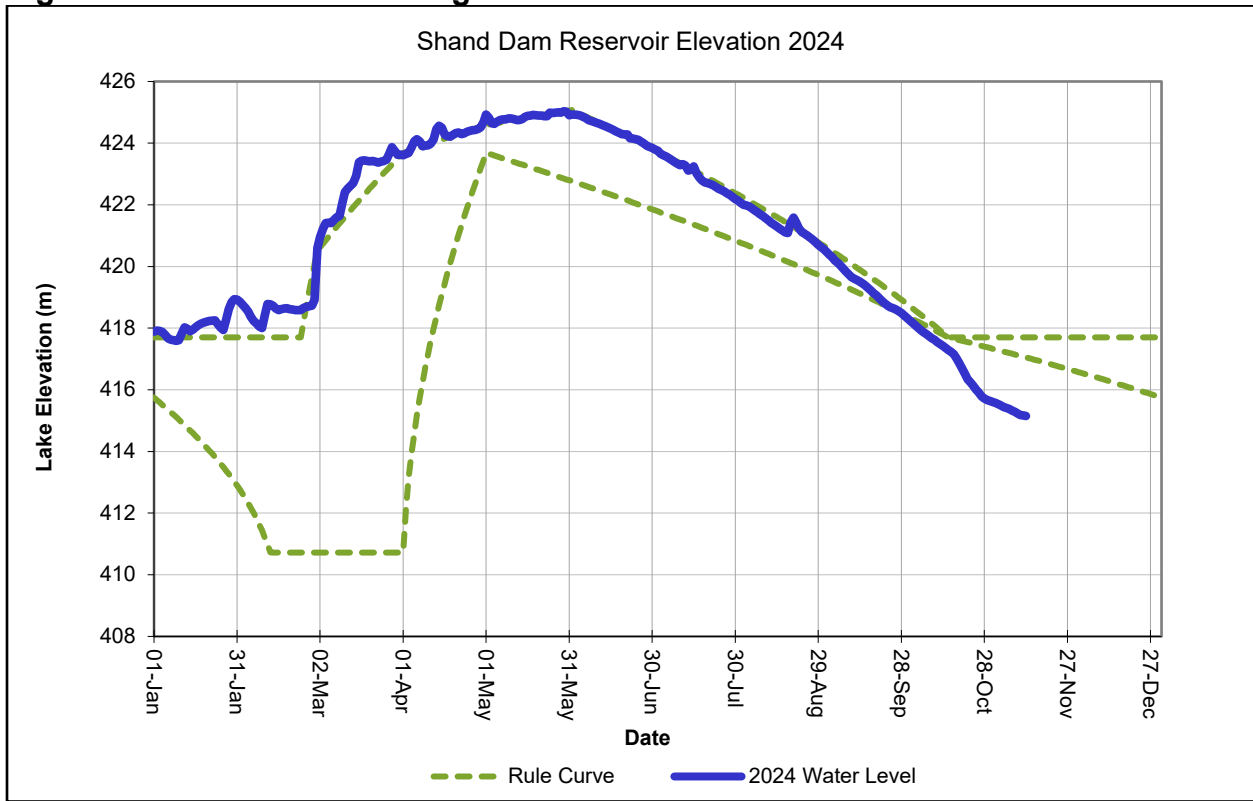


Figure 5: Guelph and Luther Reservoir Elevation Charts for 2024

