

Grand River Conservation Authority

Report number: GM-10-24-100

Date: October 25, 2024

To: Members of the Grand River Conservation Authority

Subject: Current Watershed Conditions as of October 15, 2024

Recommendation:

THAT Report Number GM-10-24-100 – Current Watershed Conditions as of October 15, 2024 be received as information.

Summary:

Precipitation in September was below average across the watershed. On average, the stations have only received about 40 percent of the long-term normal precipitation for half of October so far. As of October 15, 3-month indicators for precipitation are showing below normal conditions at 6 of 8 climate stations.

Recorded temperatures in September 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 2 degrees Celsius warmer than normal. The temperature during the first 15 days of October at the Shand Dam climate station was around 1.1 degrees Celsius warmer than the long-term average for the first half of October.

Guelph Dam and Luther Dam are at their normal operating levels for this time of year and Shand Dam is just below the lower rule curve. Conestogo Dam has been drawn down to accommodate concrete rehabilitation on the upstream side of the dam. The GRCA is also preparing for a maintenance project on the Shand Dam, pending GRCA Board approval on October 25, 2024.

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 below normal precipitation.

Report:

Precipitation

The watershed received below normal rainfall in September.

In the first 15 days of October, recorded precipitation ranged from 24 to 80 percent of the long-term average for half of the month of October 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 on average. Precipitation amounts ranged from around 74 percent at the Conestogo climate station to 109 percent at the Shades station with an overall average of around 88 percent. Over longer periods, recorded precipitation

is close to normal long-term averages. 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 October 15, 2024.

Climate Station	Current Month Precipitation (mm)	Long Term Average Precipitation (mm)	Percentage of Long-Term Average (%)
Shand	14.0	42.1	33%
Conestogo	22.0	46.5	47%
Guelph	9.2	39.0	24%
Luther	35.8	44.6	80%
Woolwich	10.2	34.1	30%
Laurel	12.8	42.6	30%
Shades	9.6	40.0	24%
Brantford	14.5	34.8	42%

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	43%	84%	107%	107%	107%
Conestogo	31%	74%	88%	93%	99%
Guelph	39%	85%	106%	103%	106%
Luther	24%	86%	105%	103%	106%
Woolwich	22%	78%	99%	94%	96%
Laurel	32%	84%	97%	95%	95%
Shades	33%	109%	115%	108%	112%
Brantford	32%	106%	116%	112%	108%

Air Temperatures

Recorded temperatures in September at Luther, Shand, Shades, and Brantford were warm at around 2 degrees Celsius higher than the long-term average at the stations, overall.

The average temperature at the Shand Dam climate station over the first 15 days of October was 11 degrees Celsius which is around 1.1 degrees warmer than the long-term average for the first half of the month of October. A visual representation of these trends for the Shand climate station is provided in Figure 2.

Lake Erie Water Levels

During September, the average lake level was approximately 0.28 meters above the long-term average. As of October 14, levels have followed 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 and Shand is just below the lower rule curve.

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 2 months to continue the concrete rehabilitation. Water levels may be reduced up to 30 cm per day as needed to accommodate the work.

The GRCA is also preparing for a maintenance project on the Shand Dam, pending GRCA Board approval on October 25, 2024. To accommodate the work, water in the Belwood reservoir will be lowered at a faster rate than is typical for this time of year, beginning the week of Tuesday, October 15, 2024. The drawdown will continue until a water elevation of approximately 415 meters is met prior to the project beginning. The dam will continue to operate as intended throughout the duration of the project and provide its primary flood storage and flow augmentation functions.

Reservoir operations and drawdown 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 73 and 88 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

Members of the Grand River Low Water Response Team met on September 27, 2024, to discuss recent dry conditions. 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 and that above average rainfall leading up to the fall seemed to help maintain groundwater levels, the Low Water Response Team agreed with GRCA's recommendation to remain in normal low water condition at the time of the meeting.

Precipitation and streamflow data will continue to be monitored along with groundwater level data. The Low Water Response Team will meet to review conditions as a group, as needed.

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 October, November, and December.

Flood Preparedness and Flood Centre Activities

The GRCA flood operations centre did not issue any flood messages in September or October, 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 October 15, 2024

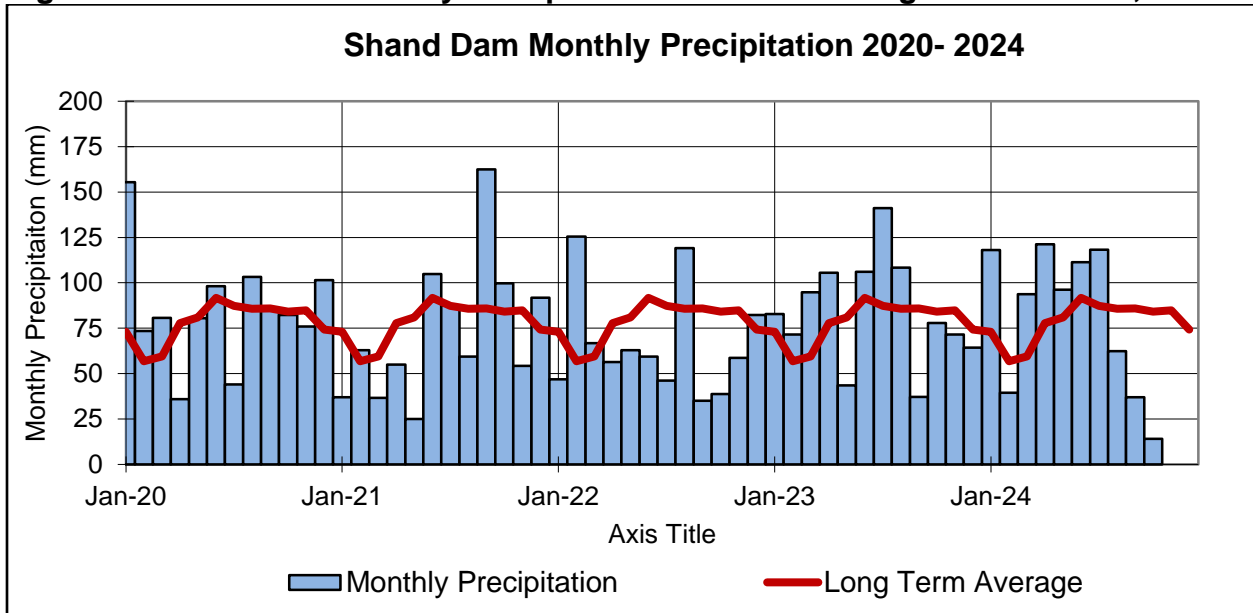


Figure 2: Monthly Average Air Temperatures at Shand Dam from 2020 to October 15, 2024

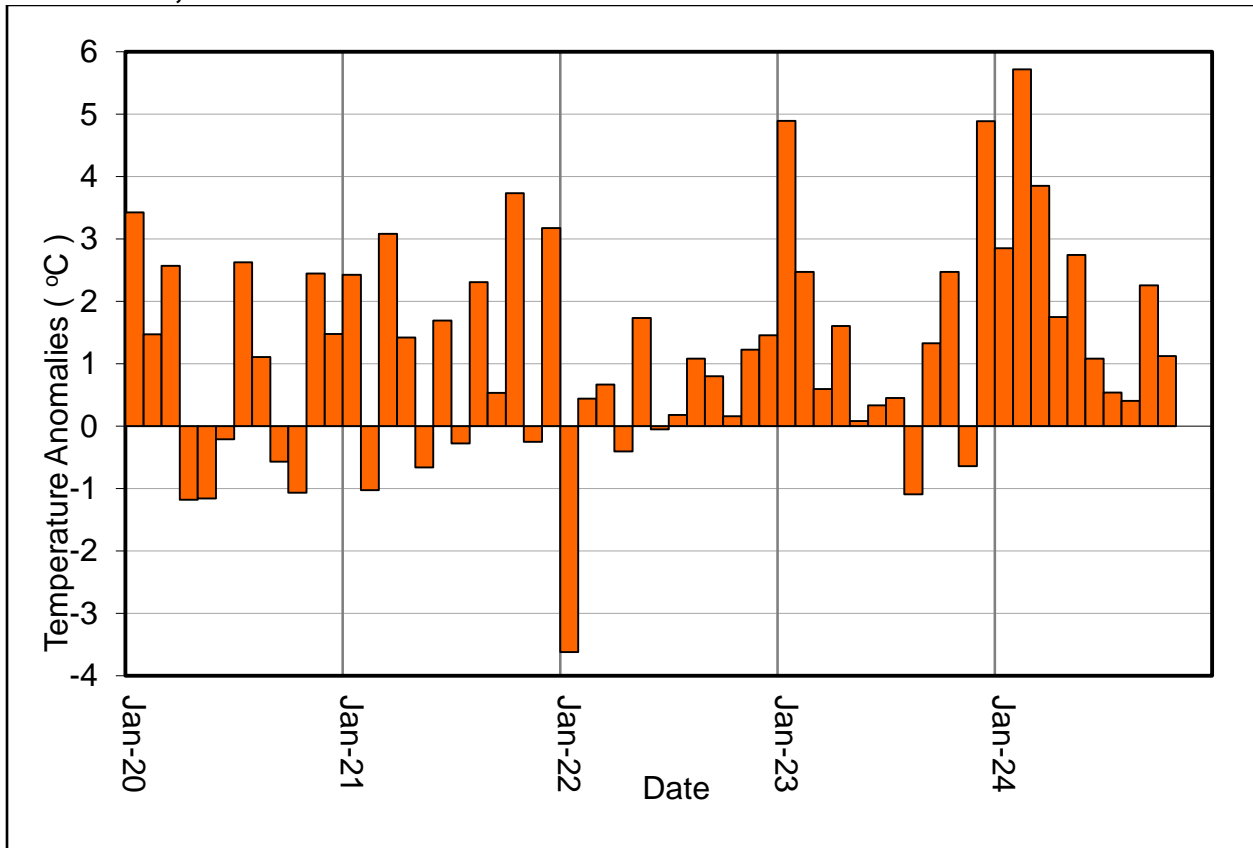


Figure 3: Water levels for Lake Erie at Port Colborne

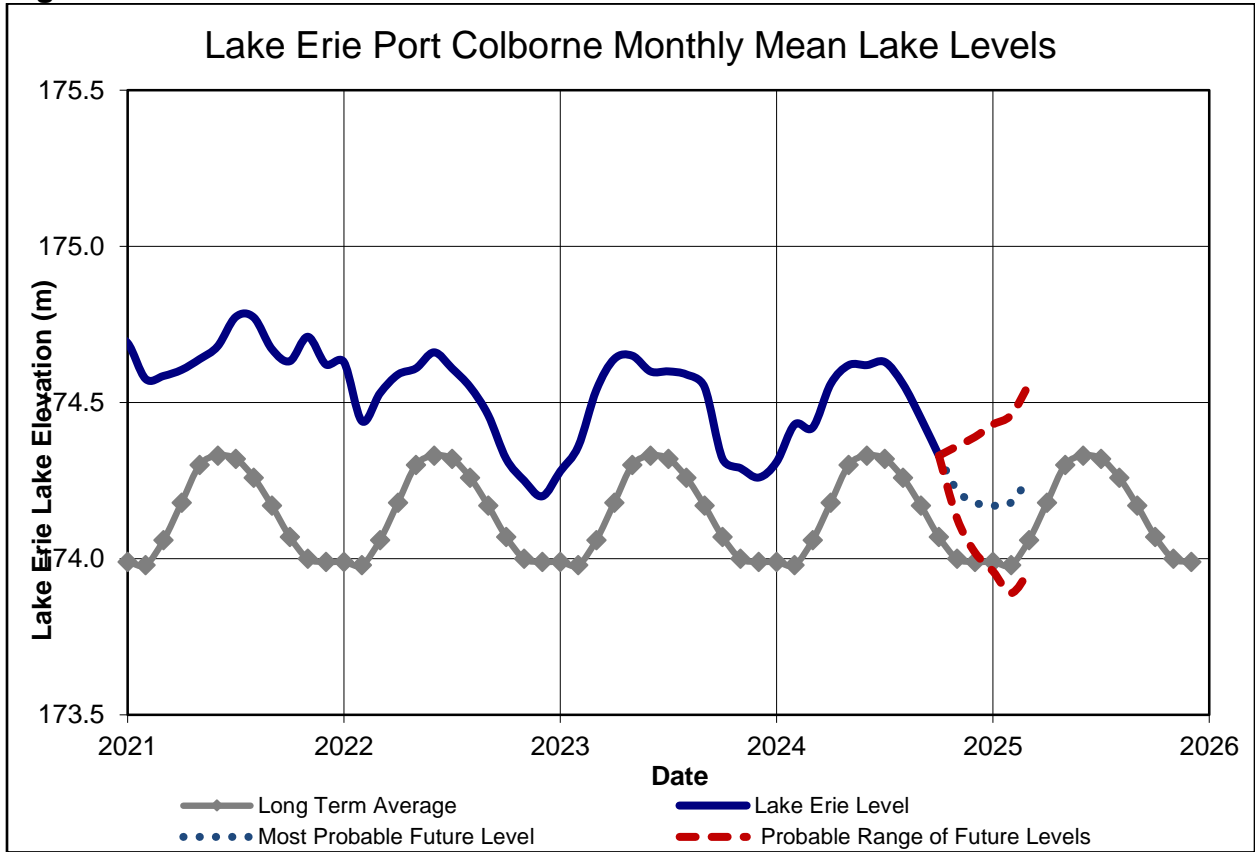


Figure 4: Shand and Conestogo Reservoir Elevation Plots for 2024

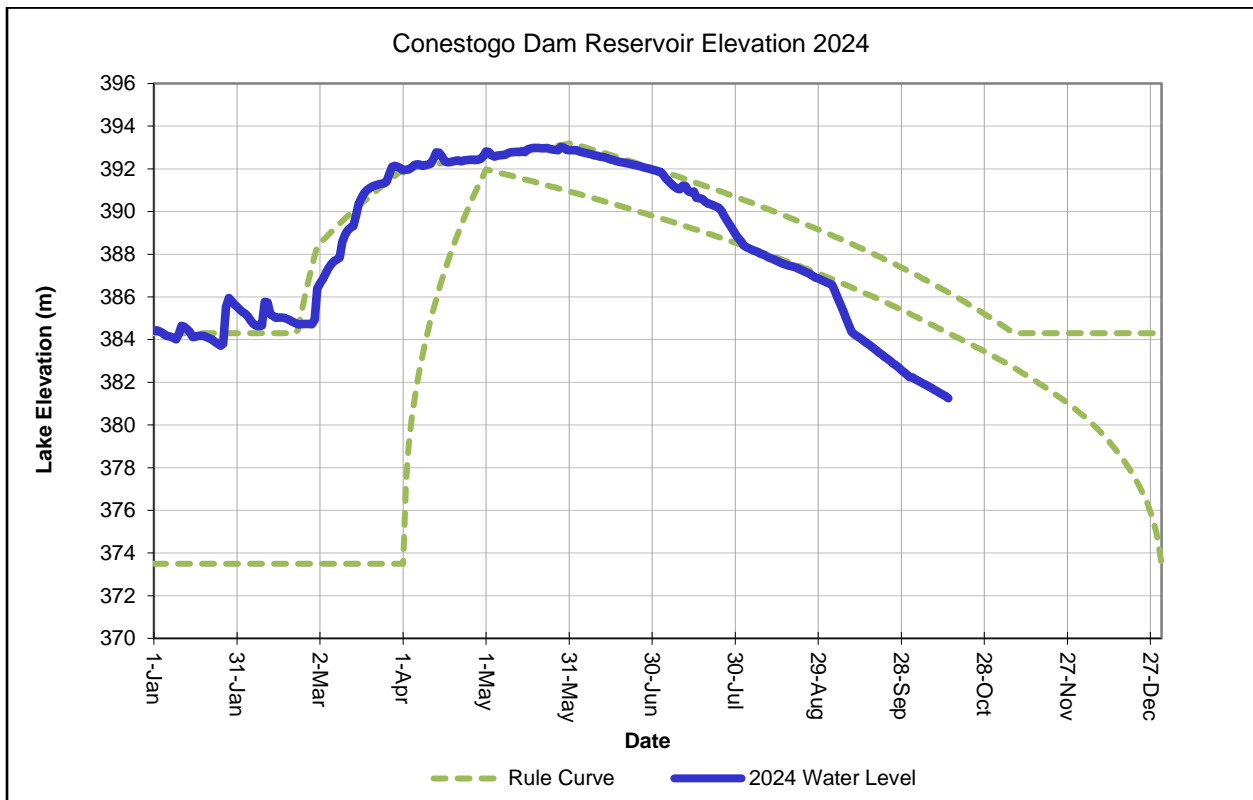
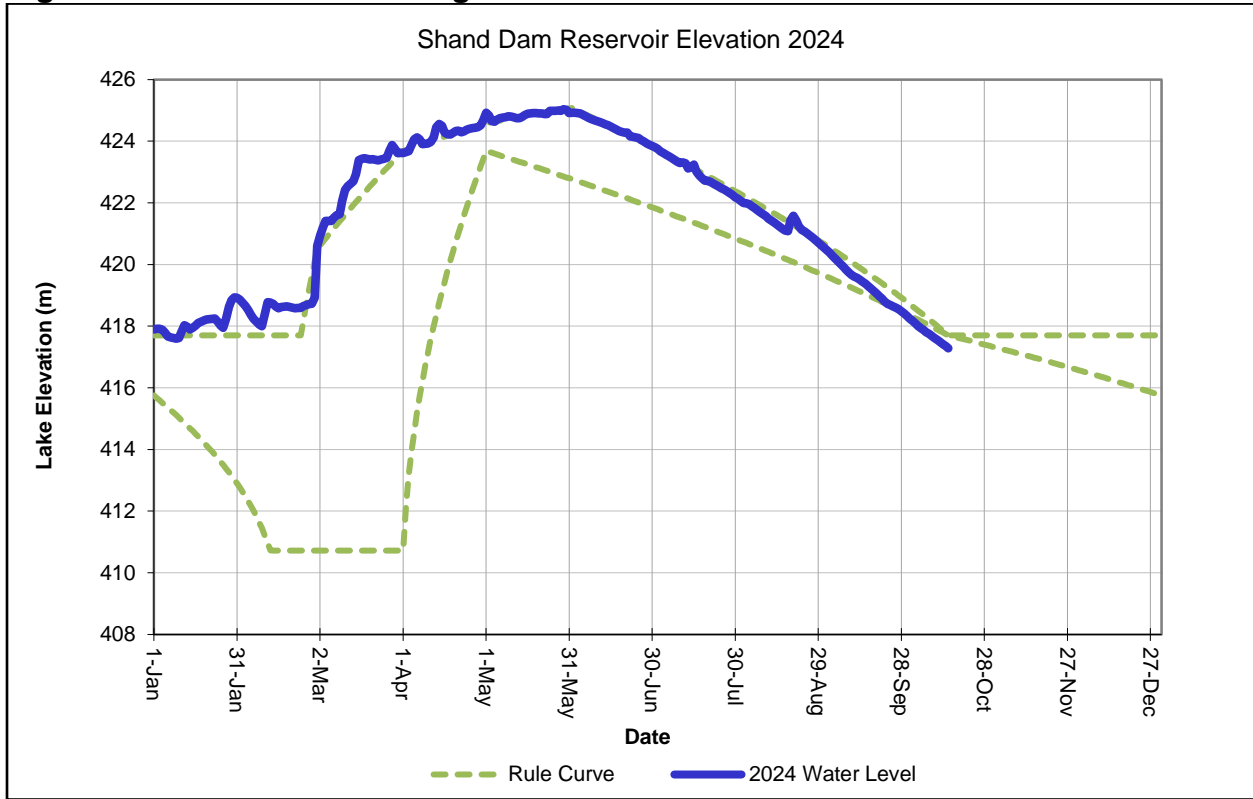


Figure 5: Guelph and Luther Reservoir Elevation Charts for 2024

