

Grand River Conservation Authority

Report number: GM-02-25-19

Date: February 28, 2025

To: Members of the Grand River Conservation Authority

Subject: Current Watershed Conditions as of February 18, 2025

Recommendation:

THAT Report Number GM-02-25-19 – Current Watershed Conditions as of February 18, 2025 be received as information.

Summary:

Precipitation in January ranged from 37 percent of normal at Environment and Climate Change Canada's Brantford Airport climate (Brantford) to 170 percent at the Luther climate station. On average, precipitation was close to normal for January across the watershed. As of February 18, 3-month indicators for precipitation are showing around 103 percent normal at the 8 climate stations overall.

Recorded temperatures at Shand, Luther, Shades, and Brantford show that the average temperature across the watershed was around 1.3 degrees Celsius colder than normal in January. February has continued to be colder than normal with temperatures at the Shand Dam climate station around 0.9 degrees Celsius below the long-term average for the first half of February.

Guelph Dam and Conestogo Dam are within their normal operating ranges for this time of year, with levels below their respective upper rule curves. Shand Dam has been drawn down to accommodate rehabilitation work. Luther Dam is above the upper rule curve to maintain additional storage.

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 because of the rehabilitation work at Shand Dam.

Lake Erie remains above but trending closer to the long-term average.

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

Report:

Precipitation

Compared to the long-term average for January, precipitation at climate stations across the watershed ranged from 37 percent at Brantford to 170 percent at Luther with an overall average of around 108 percent at all eight climate stations. Precipitation occurred as mostly snow.

Winter storms in the first 18 days of February resulted in recorded precipitation ranging from 176 to 321 percent of the long-term average for half of the month of February at climate stations across the watershed. Brantford recorded less precipitation than the other stations in February, so far, with Luther recording the most snow. Data is shown in Table 1.

Snow measurements were completed on February 18 as part of the Ministry of Natural Resources Snow Survey Program. The measured snow water equivalent (S W E) was high to very high compared to the respective long-term averages for February 15 at 9 of 12 locations and normal at 2 sites at the north part of the watershed. Based on the recorded snow densities,

it is possible the Corbetton S W E is underreported. Damascus was not accessible on February 18. A map of the results is shown in Figure 1.

Trends in precipitation, as presented in Table 2, show that over the past 3 months, the watershed has experienced close to normal conditions overall, with Brantford and Shades recording below normal precipitation and the rest of the stations recording above or close to normal precipitation. Precipitation amounts ranged from around 73 percent at Brantford to 123 percent at the Luther climate station with an overall average of around 103 percent. Over longer periods of 12 to 18 months recorded precipitation is just below normal long-term averages overall. A visual representation of these trends for the Shand climate station is provided in Figure 2.

Table 1: Current monthly precipitation for climate stations across the watershed up to the morning of February 18, 2025.

Climate Station	Current Month Precipitation (m m)	Long Term Average Precipitation (m m)	Percentage of Long-Term Average (%)
Shand	75.8	28.4	267%
Conestogo	79.4	32.9	241%
Guelph	68.0	27.4	248%
Luther	104.5	33.2	315%
Woolwich	50.6	28.8	176%
Laurel	71.8	29.8	241%
Shades	88.4	27.5	321%
Brantford	46.4	21.7	214%

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	118%	108%	78%	102%	101%
Conestogo	151%	121%	80%	97%	93%
Guelph	107%	102%	73%	97%	96%
Luther	170%	123%	88%	106%	100%
Woolwich	108%	105%	75%	96%	93%
Laurel	104%	104%	76%	93%	90%
Shades	67%	86%	77%	99%	99%
Brantford	37%	73%	58%	95%	96%

Air Temperatures

Recorded temperatures in January at Luther, Shand, Shades, and Brantford were around 1.3 degrees Celsius colder than the long-term average at the stations, overall. Temperatures in the first 18 days of February remain colder than average with temperatures at the Shand Dam and Shades Dam climate stations close to 1 degree Celsius below the long-term average for the first half of February. A visual representation of these trends for the Shand climate station is provided in Figure 3.

Lake Erie Water Levels

During January, the average lake level was 0.12 meters above the long-term average and 0.16 meters below last year. As of February 16, the mean water level in Lake Erie was around 0.05 meters above the long-term average and 0.36 meters below February 2024.

The most probable forecast for Lake Erie is for lake levels to reach a seasonal low before transitioning towards a seasonal increase, closer to the long-term average. Figure 4 shows the observed water levels starting in 2021 as well as the range of water levels expected over the next five months. Lake Erie is completely ice-covered.

Reservoir Conditions

The large reservoirs are being used to meet downstream flow targets to the extent possible. Conestogo and Guelph reservoirs are within their normal operating ranges for this time of year, with levels below their respective upper rule curves. The first phase of the Conestogo Dam project concluded in mid-December and the next phase of the project will begin in late spring or early summer of 2025.

The GRCA is undergoing a maintenance project on Shand Dam. To accommodate the work, water in the Belwood reservoir has been lowered below the gates. 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 at other GRCA dams may be adjusted to accommodate the maintenance drawdown at Shand and to augment low flow as needed. The Luther reservoir level is above the upper rule curve with additional storage maintained for this purpose.

There is 87 and 83 percent available flood storage at Shand and Conestogo, respectively. Year to date reservoir levels and operating rule curves are shown in Figures 5 and 6 for the four largest reservoirs.

River Ice Conditions

Cold temperatures in January and the first half of February have resulted in ice formation on many of the watercourses throughout the watershed.

Intact ice cover reduces the production of frazil ice but can lead to breakup ice jams during the spring melt. Conditions will continue to be monitored over the coming months in preparation for the spring melt.

Low Water Response

Winter storms in February increased precipitation trends for the watershed. Precipitation and streamflow data will continue to be monitored along with groundwater level data.

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 February, March, and April 2025.

Flood Preparedness and Flood Centre Activities

The GRCA flood operations center did not issue any flood messages in January or February, so far.

A reservoir operator and river watch training session is scheduled for February 26 and a spring flood coordinators meeting is scheduled for March 4.

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: Map of Grand River Watershed Snow Survey Results for February 18, 2025

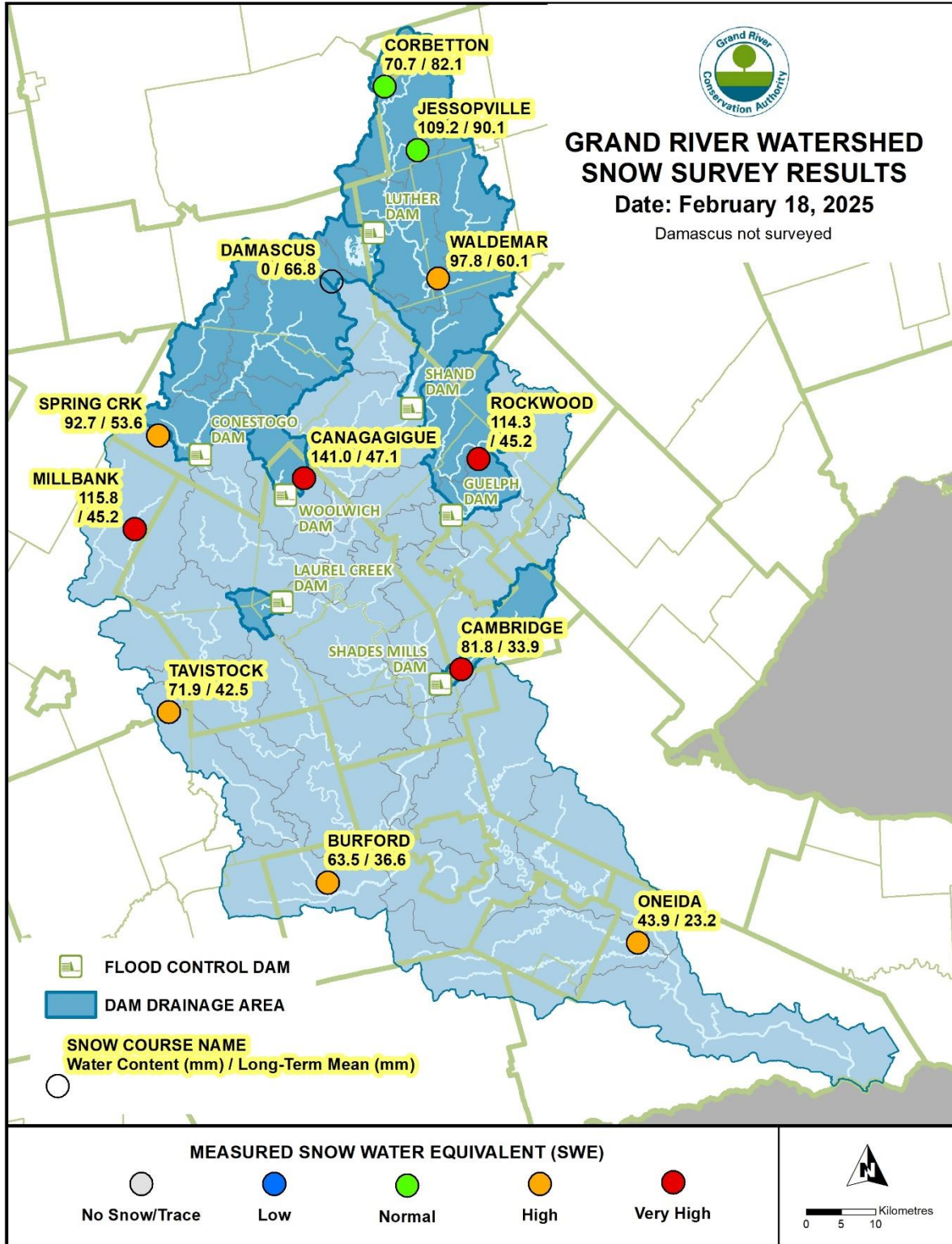


Figure 2: Shand Dam Monthly Precipitation 2021 to February 18, 2025

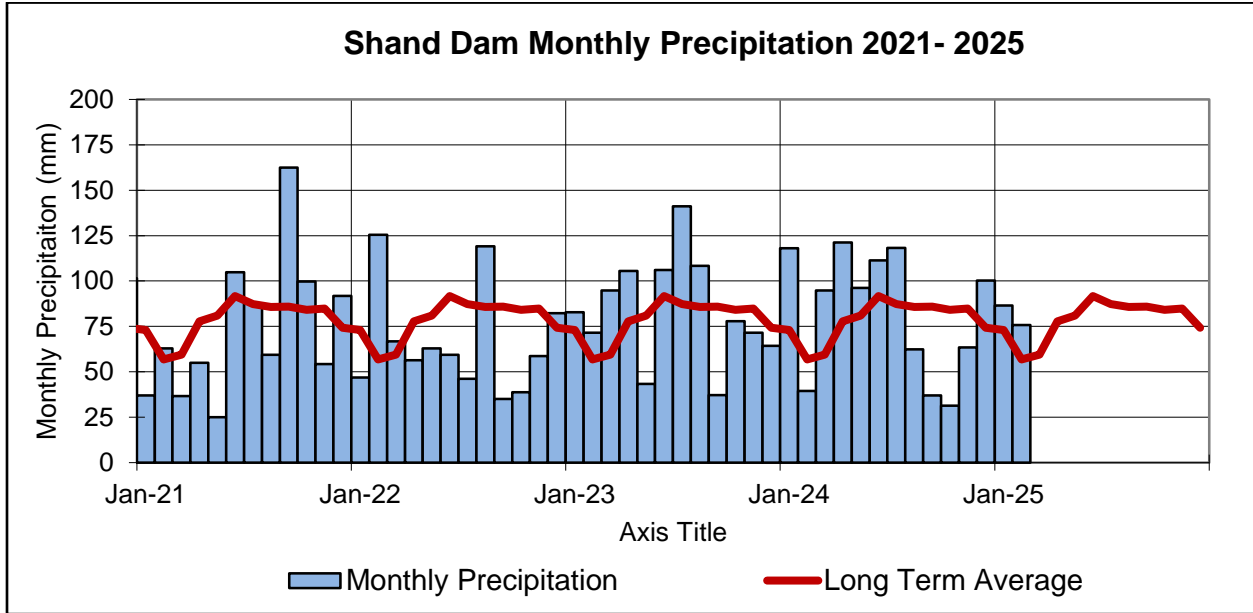


Figure 3: Monthly Average Air Temperatures at Shand Dam from 2021 to February 18, 2025

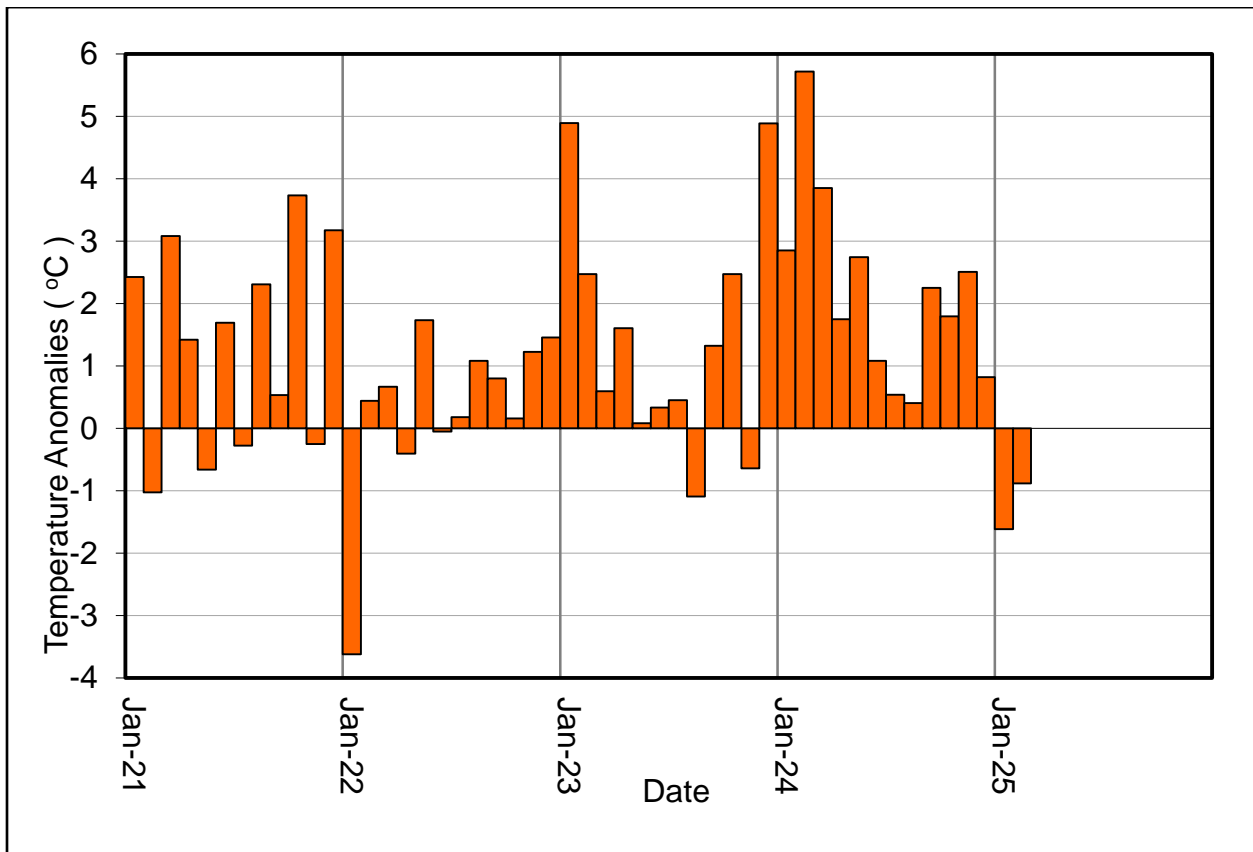


Figure 4: Water levels for Lake Erie at Port Colborne

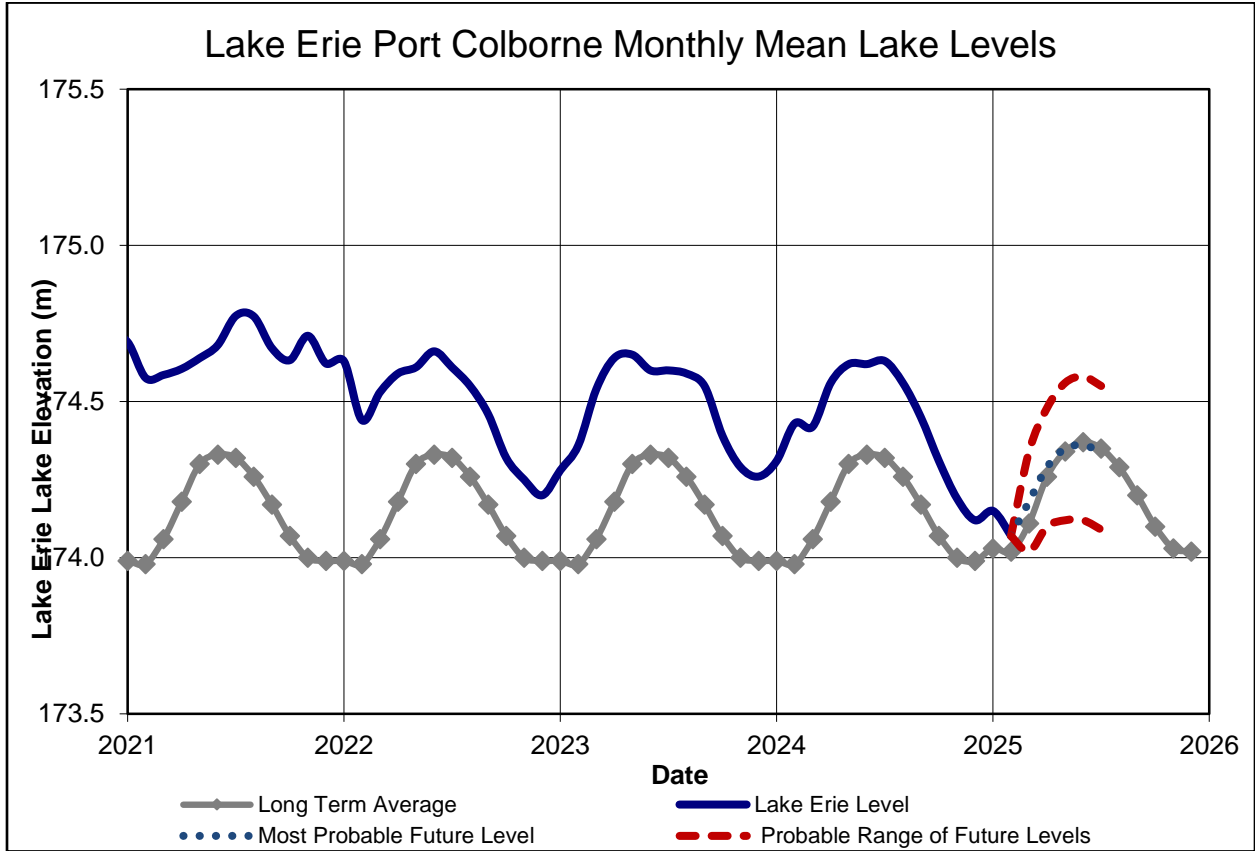


Figure 5: Shand and Conestogo Reservoir Elevation Plots for 2025

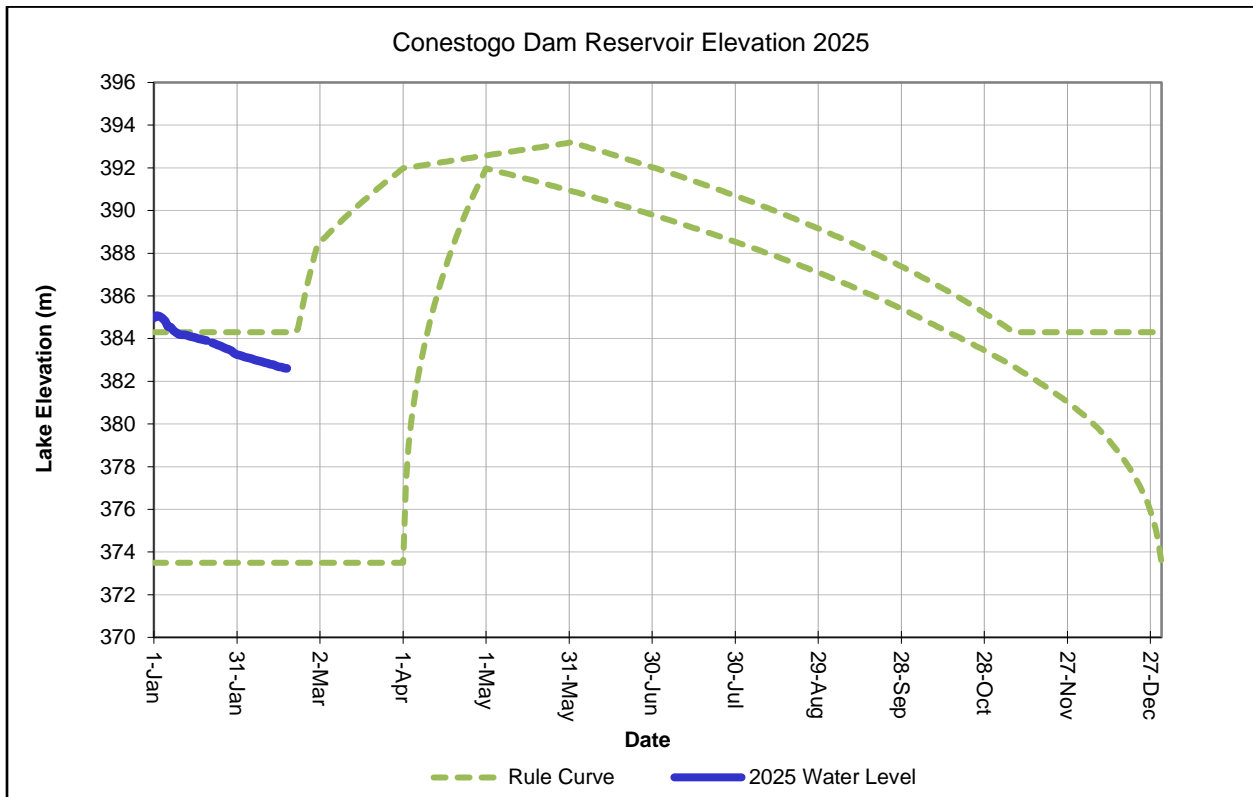
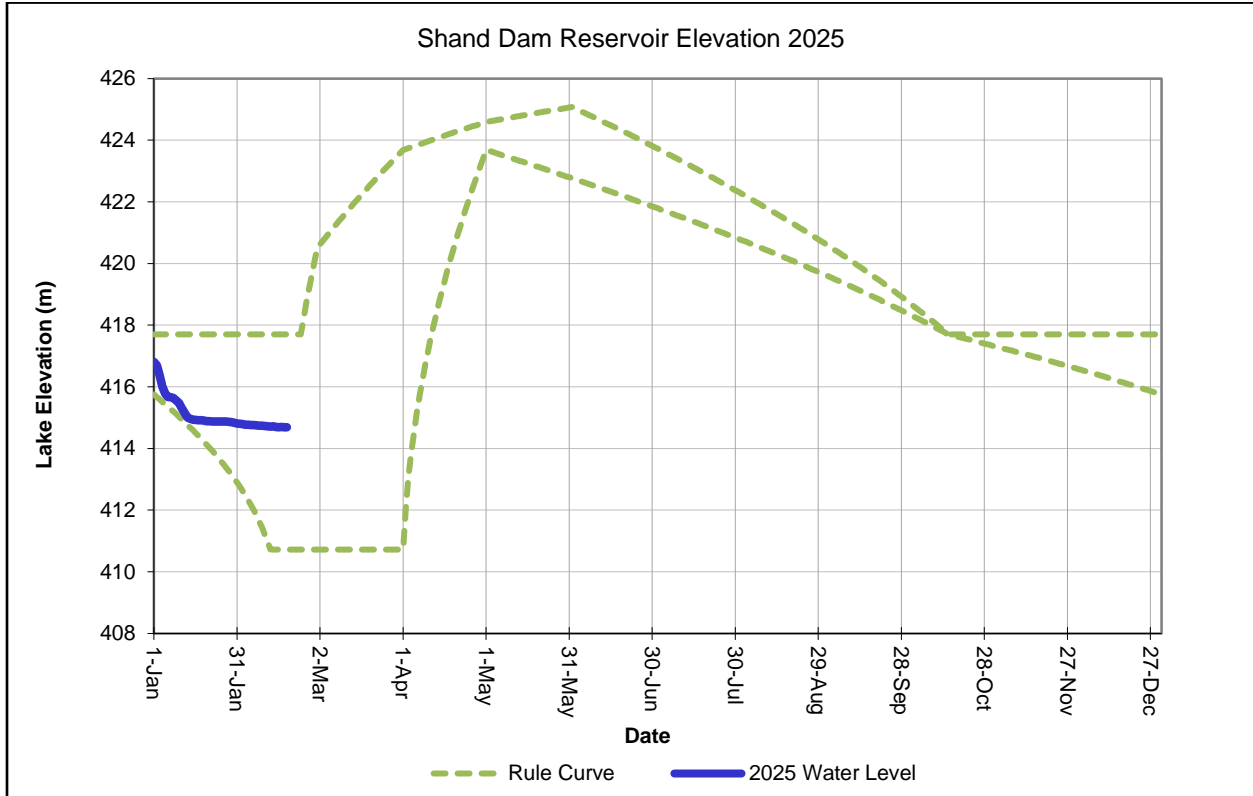


Figure 6: Guelph and Luther Reservoir Elevation Charts for 2025

