Grand River Conservation Authority

Report number: GM-03-25-26

Date: March 28, 2025

To: Members of the Grand River Conservation Authority

Subject: Current Watershed Conditions as of March 18, 2025

Recommendation:

THAT Report Number GM-03-25-26 – Current Watershed Conditions as of March 18, 2025 be received as information.

Summary:

Precipitation in February ranged from 113 percent of normal at Environment and Climate Change Canada's Brantford Airport climate (Brantford) to 183 percent at the Luther climate station. On average, precipitation was above normal for February across the watershed. As of March 18, 3-month indicators for precipitation are showing around 130 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 0.4 degrees Celsius colder than normal in February. March has been warmer with temperatures at the Shand Dam climate station around 3.3 degrees Celsius above the long-term average for the first half of March.

The large reservoirs are being used to minimize downstream flooding from a significant snowmelt event that began on Friday, March 14. Run off from the melt event was used to fill the reservoirs and they are following the operational rule curves for this time of the year.

The large reservoirs will continue to serve their primary functions of flood storage and low flow augmentation.

Lake Erie is just above the long-term average.

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

Report:

Precipitation

Compared to the long-term average for February, precipitation at climate stations across the watershed ranged from 113 percent at Brantford to 183 percent at Luther with an overall average of around 152 percent at all eight climate stations. Winter storms resulted in large amounts of snowfall throughout the watershed in February and the recorded precipitation was mostly snow.

Compared to the long-term average for half of the month of March, precipitation in the first 18 days of March ranged from 108 percent at Brantford to 186 percent at Shand with an overall average of around 136 percent at climate stations across the watershed. Data is shown in Table 1.

A lot of snow remained in the northern half of the watershed when snow measurements were completed on March 14 as part of the Ministry of Natural Resources Snow Survey Program. The measured snow water equivalent (SWE) was above the respective long-term average for March 15 at all sites in the north half of the watershed. Snow in the southern half of the watershed ranged from normal to no snow. 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 above normal precipitation overall. Precipitation amounts ranged from around 93 percent at Brantford to 155 percent at the Luther climate station with an overall average of around 130 percent. Over the past 6 months, the watershed experienced drier than normal conditions with an average of around 85 percent overall. Over longer periods of 12 to 18 months recorded precipitation is close to 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 March 18, 2025.

Climate Station	Current Month Precipitation (mm)	Long Term Average Precipitation (mm)	Percentage of Long-Term Average (%)
Shand	55.2	29.7	186%
Conestogo	35.1	31.1	113%
Guelph	43.4	28.8	151%
Luther	49.8	32.0	156%
Woolwich	31.9	25.2	126%
Laurel	38.9	29.7	131%
Shades	37.3	30.7	121%
Brantford	28.7	26.6	108%

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	156%	136%	89%	108%	101%
Conestogo	145%	147%	94%	102%	94%
Guelph	168%	134%	86%	104%	97%
Luther	183%	155%	102%	112%	102%
Woolwich	148%	132%	85%	97%	97%
Laurel	135%	129%	82%	98%	90%
Shades	171%	117%	78%	106%	98%
Brantford	113%	93%	64%	98%	95%

Air Temperatures

Recorded temperatures in February at Luther, Shand, Shades, and Brantford were around 0.4 degrees Celsius colder than the long-term average at the stations, overall. Temperatures in the first 18 days of March were warmer than average with temperatures at the Shand Dam and Shades Dam climate stations over 3 degrees Celsius above the long-term average for the first half of March. A visual representation of these trends for the Shand climate station is provided in Figure 3.

Lake Erie Water Levels

During February, the average lake level was 0.05 meters above the long-term average and 0.36 meters below last year. As of March 16, the mean water level in Lake Erie was around 0.02 meters above the long-term average and 0.29 meters below March 2024.

The most probable forecast for Lake Erie is for lake levels to transition 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. Less than 50 percent of Lake Erie is covered by ice; there is ice cover at the outlet of the Grand River.

Reservoir Conditions

The four large reservoirs were used to minimize downstream flooding from a significant snowmelt event that began on Friday, March 14. The event was driven by warm temperatures combined with rain and a near record, dense snowpack. Much of the existing snowpack melted during the event and produced very high runoff. The reservoirs were used to reduce peak flows downstream. Run off from the melt event was used to fill the reservoirs and they are following the operational rule curves for this time of the year.

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 concluded a maintenance project on Shand Dam at the end of February.

As of mid-March, there is roughly 25 percent available flood storage at Shand and Conestogo. 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 at the beginning of the year resulted in ice formation on many of the watercourses throughout the watershed. Ice conditions were actively monitored. Warm temperatures along with the recent snowmelt event have diminished most of the ice cover throughout the watershed.

Low Water Response

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 for the watershed and above normal precipitation to the east and south of the watershed over the 3 months of March, April, and May 2025.

Flood Preparedness and Flood Centre Activities

The GRCA flood operations center issued one flood message in February:

- Watershed Conditions Statement - Issued Friday, February 28, 2025, at 4:45 PM

Eight flood messages were issued in March, so far:

- GRCA Flood Message - Flood Watch - Issued Monday, March 3, 2025, at 12:00 PM
- GRCA Flood Message - Flood Watch - Issued Monday, Thursday, March 6, 2025, at 12:30 PM
- GRCA Flood Message - Combined Termination of Flood Watch/Watershed Conditions Statement - Issued Monday, Monday, March 10, 2025, at 2:00 PM
- GRCA Flood Message - Flood Watch - Issued Friday, March 14, 2025, at 4:30 PM
- GRCA Flood Message - Combined Flood Warning and Flood Watch - Issued Saturday, March 15, 2025, at 2:15 PM
- GRCA Flood Message - Combined Flood Warning and Flood Watch - Issued Saturday, March 15, 2025, at 6:45 PM

- GRCA Flood Message - Combined Flood Warning and Flood Watch - Issued Sunday, March 16, 2025, at 3:00 PM
- GRCA Flood Message – Watershed Conditions Statement - Issued Wednesday, March 19, 2025, at 11:30 AM

A reservoir operator and river watch training session was held on February 26 and a special flood coordinators meeting was held on 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 March 14, 2025

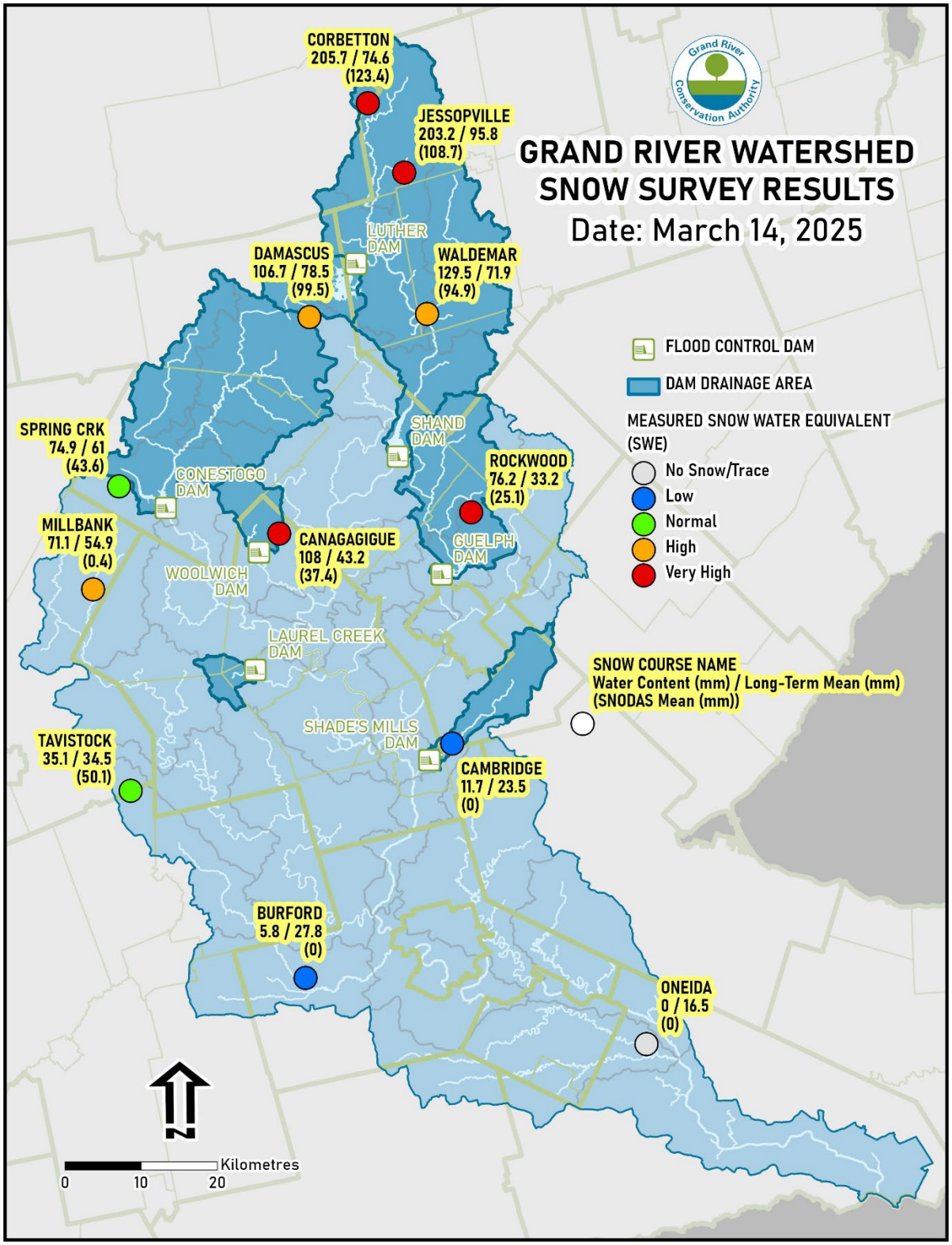


Figure 2: Shand Dam Monthly Precipitation 2021 to March 18, 2025

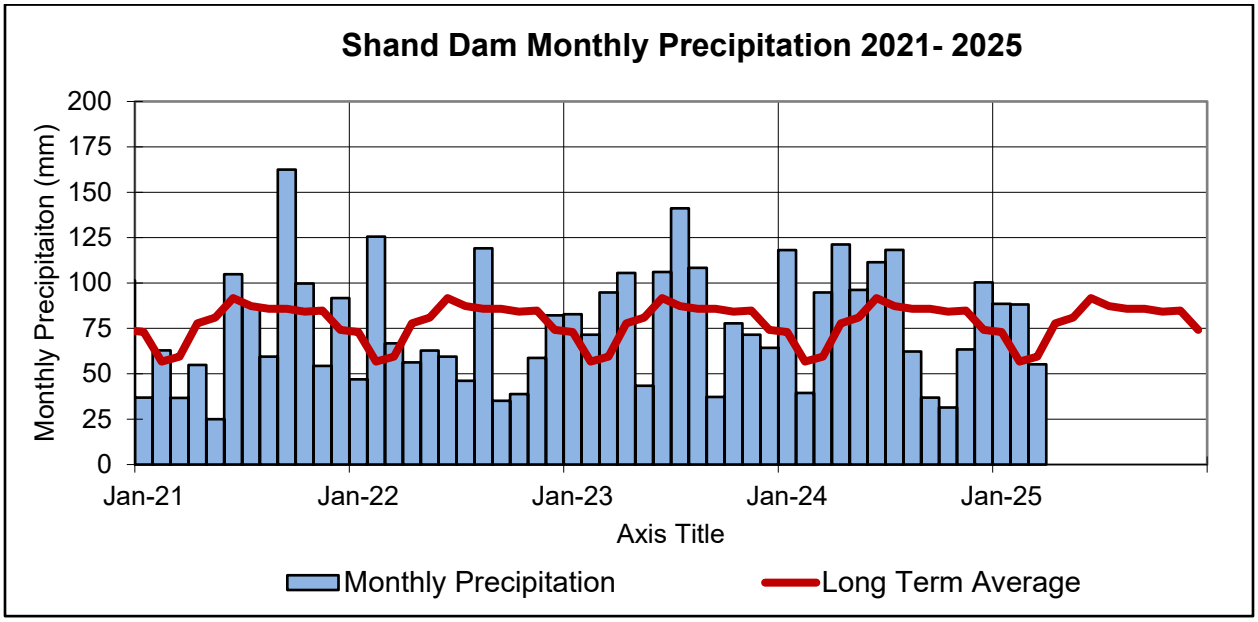


Figure 3: Monthly Average Air Temperatures at Shand Dam from 2021 to March 18, 2025

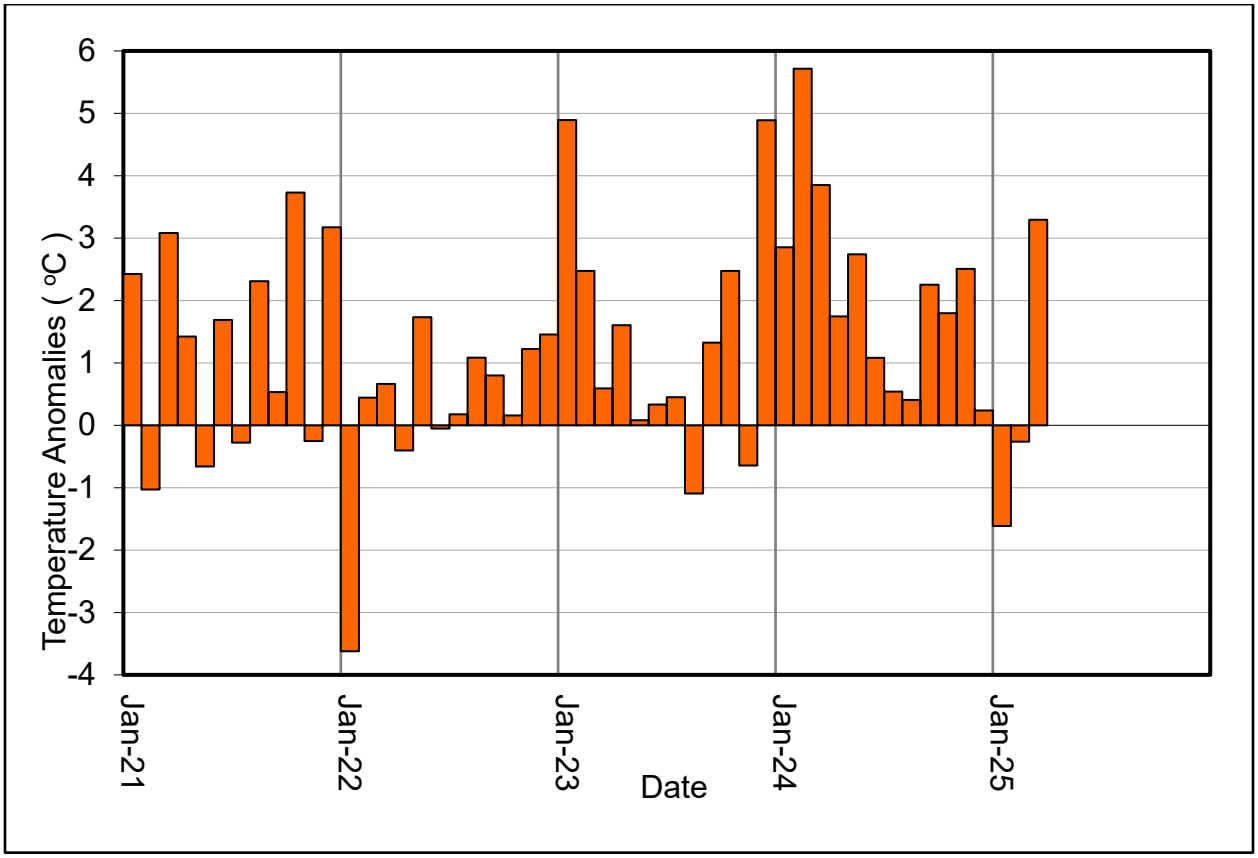


Figure 4: Water levels for Lake Erie at Port Colborne

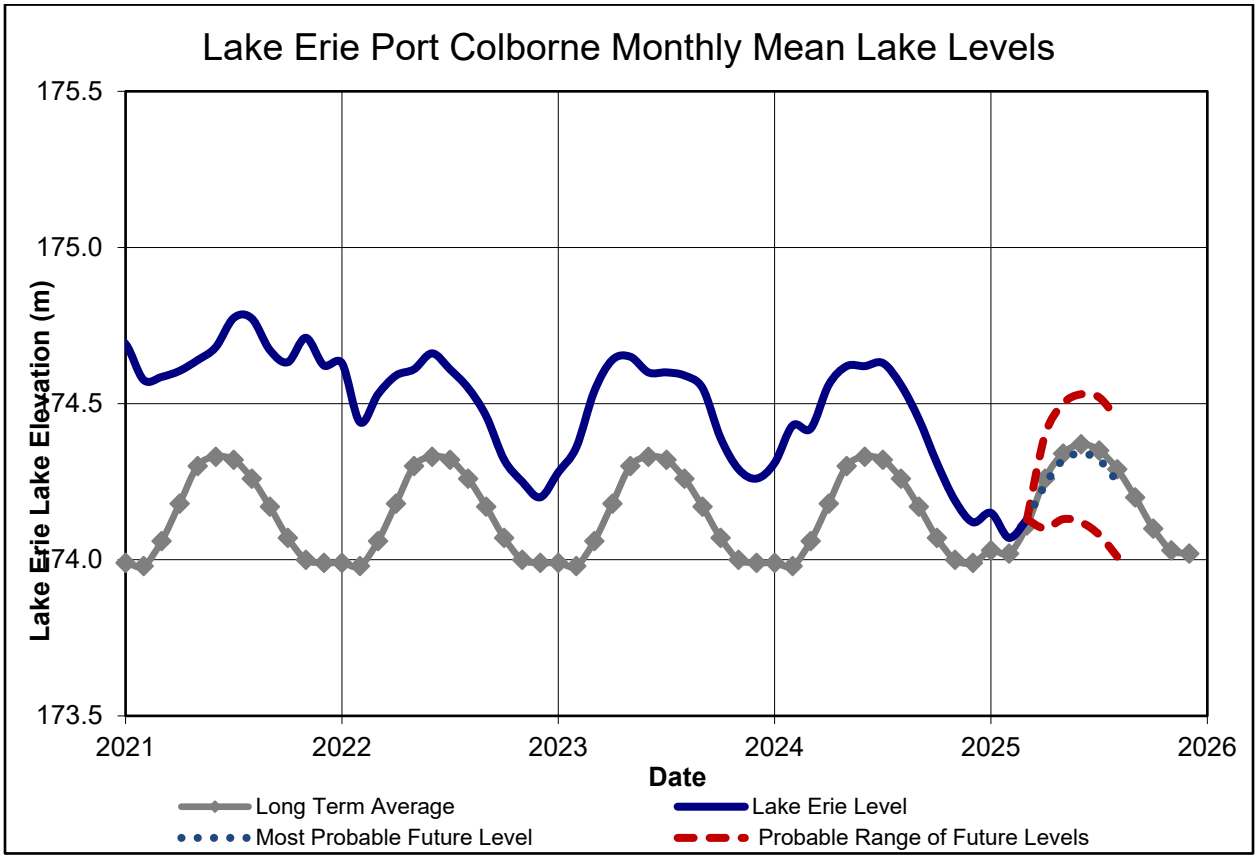
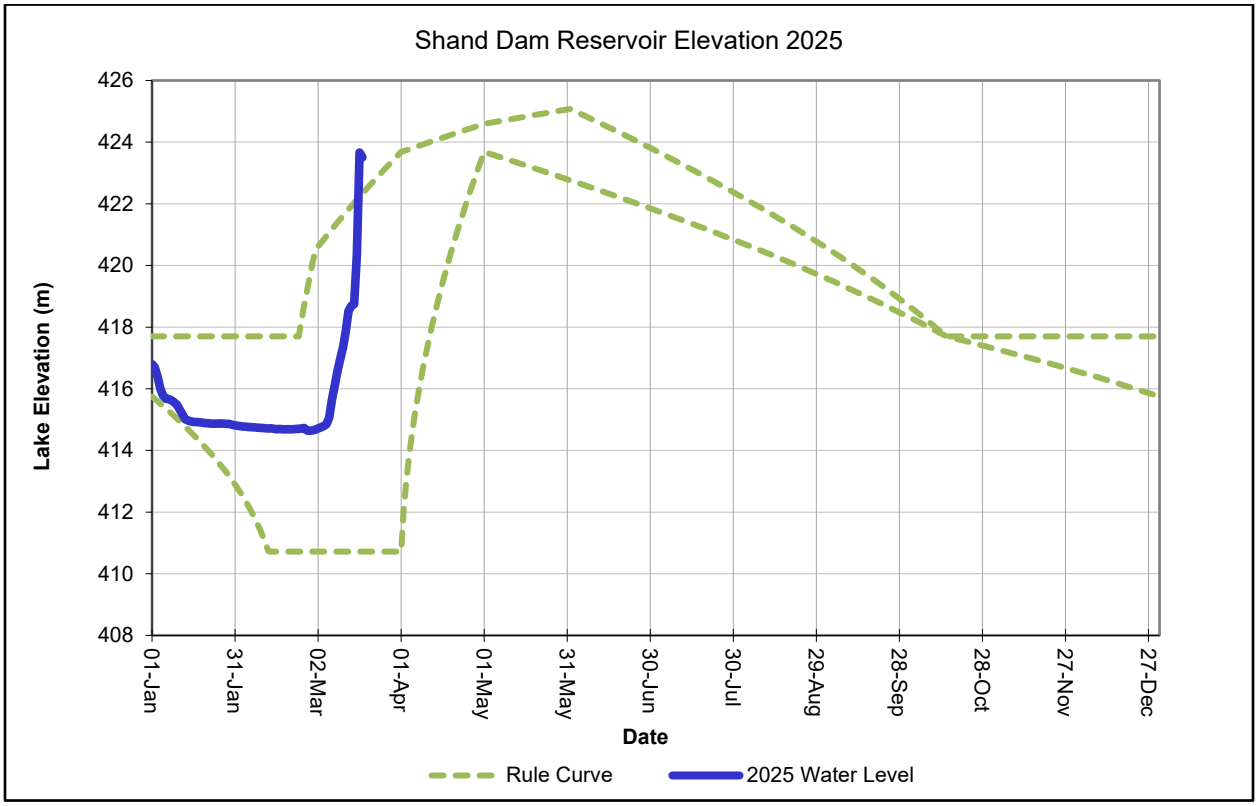


Figure 5: Shand and Conestogo Reservoir Elevation Plots for 2025



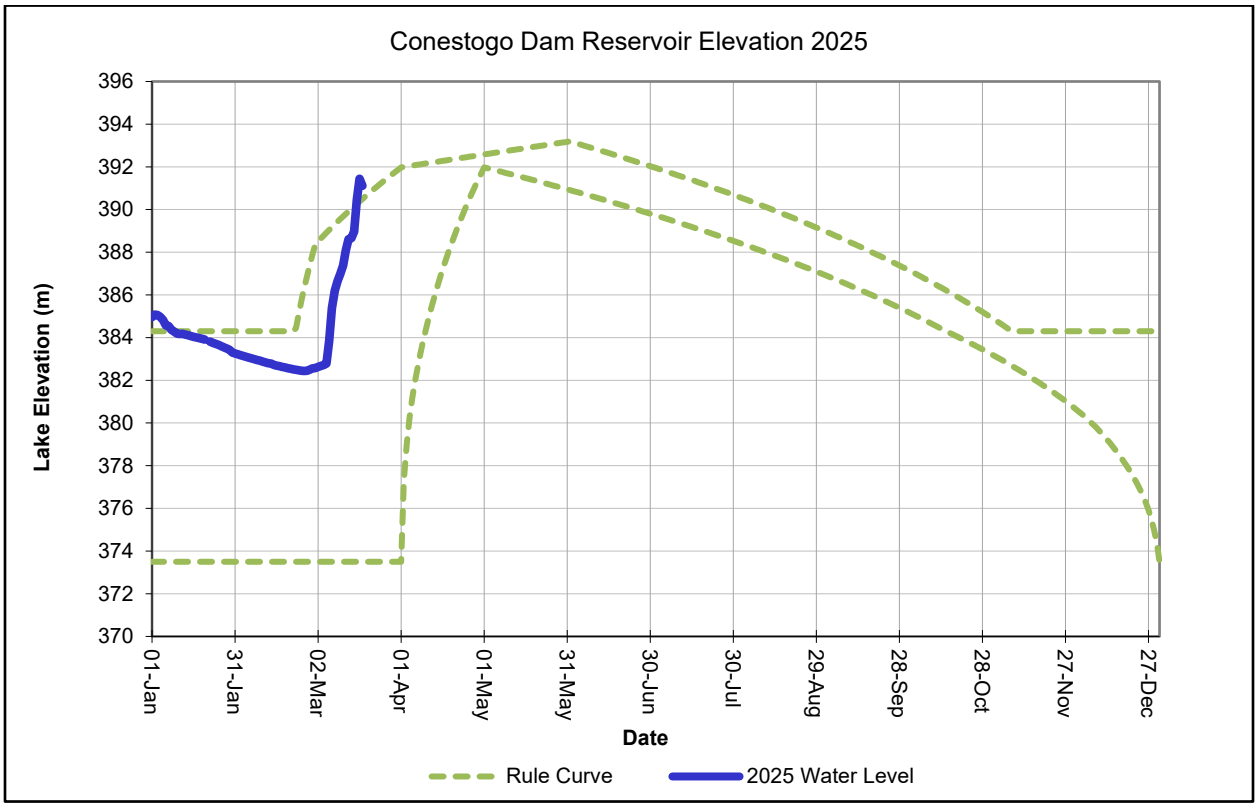


Figure 6: Guelph and Luther Reservoir Elevation Charts for 2025