One Hundred and Thirty-Ninth Progress Report to the International Joint Commission by the International Lake Ontario-St. Lawrence River Board Covering the Period September 1, 2022 through February 28, 2023

March 21, 2023

COVER PAGE

MODIS satellite image of Lake Ontario and the Upper St. Lawrence River taken on February 12, 2023 (courtesy of NOAA Coastwatch Great lakes) showing the lack of ice that was typical during the 2022-2023 winter season.

EXECUTIVE SUMMARY

Local supply conditions in the Lake Ontario basin started the reporting period (September 2022 through February 2023) below average and then transitioned to above average conditions during January and February. Continued high inflows from Lake Erie resulted in the net total supplies remaining above average for most of the reporting period.

Lake Ontario's water level started the reporting period below average (1918-2020) near low criterion H14 thresholds. Continuing dry conditions resulted in the lake reaching its annual minimum in mid-November. Much wetter conditions were then experienced by the basin and the lake level continued to rise throughout the rest of the reporting period, ending the period above average.

The Board generally followed Plan 2014 prescribed outflows throughout the reporting period, which varied depending on weather and water supply conditions. The Board deviated from Plan 2014 beginning in late September when the water level of Lake Ontario declined below the applicable Criterion H14 low threshold. The Board also conducted minor deviations in October (to facilitate boat haul-out efforts) and December 2022 (to mitigate high water levels in the upper St. Lawrence River and loss of Hydro-Quebec transmission lines.). Each of these deviations were subsequently offset such that by January 7, the water level of Lake Ontario was equivalent to the level it would have been if no outflow deviations from Plan 2014 had been conducted during the reporting period.

Also, during the reporting period some operational adjustments were made. Temporary flow reductions were required from September 5 to 8 and again from October 2 to 5 to maintain the water level of Lake St. Lawrence above the L Limit threshold of 72.6 m. For most of November, the L Limit applied, to maintain safe operating conditions for commercial navigation in the upper portion of the St. Lawrence River, upstream of the Moses-Saunders Dam. From November 9 to 12, operational adjustments were required in accordance with the minimum M Limit. Thereafter, the L Limit continued to apply until the end of the year.

Operational outflow adjustments in accordance with the Plan 2014 I Limit were required starting January 27 to facilitate ice cover formation in the Beauharnois Canal. Beginning on February 4, operational outflow adjustments were also required to facilitate ice cover formation on Lake St. Lawrence in the International Section of the St. Lawrence River.

The Board met in person once and remotely via videoconference four times during the reporting period, along with IJC advisors, associated subcommittees, and advisory groups, to conduct business and assess conditions. The Communications Committee, individual Board and IAG members, the secretaries, and the regulation representatives continued to be actively engaged in outreach, information exchange and liaison with stakeholders throughout the system.

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1 HYDROLOGICAL CONDITIONS

1.1 LAKE ONTARIO BASIN - NET BASIN SUPPLY

Monthly net basin supplies (NBS) to Lake Ontario (see Appendix A for definition) for September 2022 through February 2023 and the average (1900-2021) for the six-month period are provided in Table 1. Net basin supplies were below average for September and October before becoming close to average in November. From December to February the NBS remained above average.

1.2 SUPPLY FROM LAKE ERIE

Although the level of Lake Erie declined from 2021, the inflows to Lake Ontario from Lake Erie remained high from September 2022 through February 2023 (Table 1). The last time the inflow from Lake Erie was below average was back in March 2015.

1.3 LAKE ONTARIO – NET TOTAL SUPPLY

The monthly net total supplies (NTS) to Lake Ontario (see Appendix A for definition) are provided in Table 1 and shown graphically in Figure 1. Figure 1 shows the long-term average monthly NTS for the period 1900 to 2021 and the supplies for 2021, 2022 and 2023 (through February). The grey horizontal bars are the long-term monthly NTS maxima and minima. Net total supplies remained above average for all months except for October, when they were just slightly below average.

1.4 OTTAWA RIVER BASIN

Outflows from the Ottawa River basin started the reporting period above average (1963-2021) for most of September, remained near to slightly below for the rest of the year. A series of large precipitation events near the end of the year greatly increased the outflow to record highs during the first week of 2023. The flows then remained above average for the rest of the reporting period (Figure 2). More details of the conditions during the Fall can be found on the Ottawa River Regulation Planning Board website here: https://ottawariver.ca/wp-content/uploads/2022/12/2022-12-15-Bulletin-Fall-Conditions.pdf

2 REGULATORY OPERATIONS

2.1 OUTFLOW MANAGEMENT OVERVIEW

Figure 3 shows actual daily outflows from Lake Ontario for 2021, 2022 and 2023 (through February). Table 2a summarizes the weekly outflows and Table 2b lists all of the flow changes that were made during the reporting period.

Overall, the total average outflow released from September 1, 2022 through February 28, 2023 was 7,160 m^3/s (252,800 cfs), this is above the average of 6,750 m^3/s (238,400 cfs) for this time period (1900-2021).

The Board generally followed Plan 2014 prescribed outflows throughout the reporting period, which varied depending on weather and water supply conditions. As described below and in Section 2.2, the board deviated from Plan 2014 beginning in late September when the water level of Lake Ontario declined below the applicable Criterion H14 low threshold. The Board also conducted minor deviations in October and December 2022. Each of these deviations were subsequently offset such that by January 7, the water level of Lake Ontario was equivalent to the level it would have been if no outflow deviations from Plan 2014 had been conducted during the reporting period.

The applicable Plan 2014 Rule Curve flows were released for most of September. Temporary flow reductions (operational adjustments) were required from September 5 to 8 to maintain the water level of Lake St. Lawrence above the L Limit threshold of 72.6 m. Beginning on September 24, a major deviation was conducted as a result of the level of Lake Ontario falling below the applicable criterion H14 low threshold (details can be found here: https://ijc.org/en/loslrb/lake-ontario-has-decreased-below-low-water-level-threshold-allows-international-lake-ontario).

Temporary flow reductions (operational adjustments) were again required from October 2 to 5 to maintain the water level of Lake St. Lawrence above the L Limit threshold of 72.6 m (238.19 ft).

The Board then authorized a minor deviation to facilitate boat haul-out efforts on Lake St. Lawrence from October 7 to 10 (details can be found here: https://ijc.org/en/loslrb/water-levels-lake-st-lawrence-be-temporarily-increased-october-7th-through-10th-while-water). As of October 14, the water level of Lake Ontario was approximately 0.8 cm (0.3 in.) higher than it would have otherwise been if Plan 2014 prescribed flows had been strictly followed in September and October.

Offsetting outflow deviations were conducted from October 15 through October 21.

However, further offsetting deviations could not be conducted for the next few months because outflows were limited to maintain safe conditions for navigation. For most of November, the L Limit applied, to maintain safe operating conditions for commercial navigation in the upper portion of the St. Lawrence River, upstream of the Moses-Saunders Dam. From November 9 to 12, operational adjustments were required in accordance with the minimum M Limit. The outflow was temporarily increased (above the maximum L Limit) to maintain the water level of Lake St. Louis (measured at Pointe Claire) near 20.64 m (67.72 ft), which is the first tier of the M Limit that applies when the water level of Lake Ontario is greater than 74.20 m (243.44 ft). Thereafter, the L Limit continued to apply until the end of the year. Another temporary flow reduction (operational adjustment) was required on December 16 to maintain the water level of Lake St. Lawrence above the L Limit threshold of 72.60 m (238.19 ft).

Offsetting deviations resumed on December 23.

However, the Board then authorized a second minor deviation in the last week of December to mitigate high water levels in the upper St. Lawrence River and loss of Hydro-Quebec transmission lines. Strong south-westerly winds on December 23 and 24 caused the water levels in the upper St. Lawrence River, upstream of the Moses-Saunders Dam, to rise. To mitigate the high water levels and to sustain energy production during the strong winds, the Lake Ontario outflow was temporarily decreased from December 24 to 27.

Offsetting deviations resumed on December 31. By January 7, the water level of Lake Ontario was equivalent to the level it would have been if no outflow deviations from Plan 2014 had been conducted during the reporting period.

Rule Curve flows were then released until January 27, when operational outflow adjustments, in accordance with the Plan 2014 I Limit, were required to facilitate ice cover formation in the Beauharnois Canal.

Beginning on February 4, operational outflow adjustments were also required to facilitate ice cover formation on Lake St. Lawrence in the International Section of the St. Lawrence River. Lake Ontario's outflow was temporarily set as low as 6,600 m^3/s (233,100 cfs).

It was necessary to apply the J limit for the week of February 11 through 17, the J Limit prescribes a maximum change in weekly average flow of 700 m3/s from one week to the next. The design principle behind the J Limit is to prevent rapid velocity and water level changes in the St. Lawrence River to minimize potential impacts to interests along the river.

2.2 Deviations from Regulation Plan 2014

Figures 4a and 4b show daily outflows for 2022 (lighter blue line) and January through February 2023 (darker blue line) compared to the weekly Plan-specified outflows from Lake Ontario (black squares) as well as preproject flows (blue circles) (i.e. the levels and outflows that would have occurred had the hydropower project, associated dredging and subsequent outflow management not been undertaken). All the outflow changes, including operational adjustments, minor and major deviations that occurred during the reporting period, are also summarized in Tables 2a and 2b. Operational adjustments are required to account for uncertainty and variation in conditions within the week to maintain the intent of the Board's outflow strategy and are not required to be offset by subsequent outflow adjustments.

As described in Section 2.1, the Board conducted major deviations beginning in late September when the level of Lake Ontario fell below the applicable criterion H14 low threshold. The Board also conducted a minor deviation; the outflow was temporarily reduced from October 7 to 10 to raise Lake St. Lawrence water levels to facilitate the removal of recreational boats from Lake St. Lawrence. As a result of the major and minor deviations, the level of Lake Ontario was temporarily 0.8 cm (0.3 in.) higher than it would have otherwise been if Plan 2014 prescribed outflows had been strictly followed.

A second minor deviation was authorized in the last week of December to mitigate the high water levels and to sustain energy production during a period of strong winds. As a result, Lake Ontario outflow was temporarily decreased from December 24 to 27.

Each of these deviations were subsequently offset such that by January 7, the water level of Lake Ontario was equivalent to the level it would have been if no outflow deviations from Plan 2014 had been conducted during the reporting period.

2.3 WATER LEVELS THROUGHOUT THE SYSTEM

Figure 5 shows the daily levels of Lake Ontario for 2021, 2022 and 2023 (through February). Lake Ontario's water level started the reporting period in September 2022 below average (1918-2021) and near the low criterion H14 thresholds. Continuing dry conditions resulted in the lake reaching an annual minimum of 74.37 m (244 ft.) in mid-November 2022. Much wetter conditions were then experienced in the basin and the lake level rose throughout the rest of the reporting period, ending the period above average. The water levels of Lakes Superior, Michigan-Huron and Erie remained above their seasonal long-term averages for the entire reporting period.

As a means of determining the effect of the hydropower project, associated dredging and subsequent outflow management, a comparison of Lake Ontario's actual monthly levels and outflows to those that would have occurred under "preproject" conditions is provided in Table 3. This summary shows that Lake Ontario was approximately 56 to 73 cm (1.8 to 2.4 ft.) lower than it would have been under the natural preproject condition throughout the reporting period. A comparison of the daily levels to long-term average, preproject levels (blue circles), and computed Plan 2014 levels (black squares) in 2022 and 2023 (through February) is also shown in Figures 6a and 6b.

In the first two months of the reporting period, the lake declined 18 cm (7.1 in.) and 10 cm (3.9 in.), which is close to the average declines for those months, which are 15 cm (5.9 in.) for September and 11 cm (4.3 in.) for October. The lake level then started to go up, with a rise of 6 cm (2.4 in.) in November while the long-term seasonal average pattern is for levels to decline by 3 cm (1.2 in.). The lake rose by 9 cm (3.5 in.) in December compared to the average rise of only 1 cm (0.4 in.). Then in the last two months of the reporting period, the lake saw a rise of 19 cm (7.5 in.) and 11 cm (4.3 in.) for January and February respectively, compared to the averages of 6 cm (2.4 in.) and 3 cm (1.2 in.) during those months. The rise of 45 cm (17.7 in.) between the start of November and the end of February was tied for the second largest rise during that time period on record. On the last day of the reporting period, Lake Ontario was at a level of 74.83 m (245.51 ft), which was 19 cm (7.5 in.) above average.

The water levels of Lake St. Lawrence at Long Sault Dam (Figure 7) remained at or above the navigation season minimum of 72.6 m (238.19 ft) throughout most of the fall except for September 5-6, when levels dropped to 72.52 m (237.9 ft) and October 2 when the level was 72.49 m (237.8 ft) due to sustained northeasterly winds. On both occasions, operational adjustments to the outflow combined with a shift in prevailing winds quickly returned lake levels above the navigation season minimum.

Lake St. Lawrence levels remained below average during September and then rose to just above average levels during October and stayed there for most of November. Late November and early December saw a decline in the level before being affected by strong winds that put the level well above average to a daily mean peak of 73.96 m on December 24. The level stayed generally above average for the rest of the reporting period, ending the reporting period at 73.27 m (240.39 ft).

Daily water levels at Summerstown on Lake St. Francis were generally below average (1960-2021) throughout the entire reporting period. Daily mean levels temporarily went below the Seaway low alert level once in November 2022, twice in December 2022, and twice in January 2023.

The daily water levels on Lake St. Louis at Pointe-Claire (Figure 8) started the reporting period close to average (1960-2021) during the month of September and then declined to remain well below average for the rest of the year. A series of large precipitation events near the end of the year greatly increased

the Ottawa River outflow to record highs during the first week of 2023. The sudden rise of the Ottawa River outflow caused the level of Lake St. Louis to rise quickly resulting in above average levels to start 2023. The level then dropped and fluctuated between below and above average for the rest of the reporting period, ending it close to average.

The daily levels at the Port of Montreal (Figure 9) and at Sorel on Lake St. Peter (Figure 10) generally followed the same patterns as Lake St. Louis. The levels were below average from September to December before rebounding in early January to above average. The levels then oscillated around their average levels, ending the reporting period a bit below average.

2.4 Iroquois Dam Operations

The gates at Iroquois Dam remained open for the entire reporting period.

The public can learn more about the operation of Iroquois Dam by watching a short video on the Board's website (Module 4): https://ijc.org/en/loslrb/library/modules.

2.5 Long Sault Dam Operations

A varying number of gates were opened at Long Sault Dam, at different times, to spill the amount of total Lake Ontario outflow that exceeded the capacity of the Moses-Saunders Dam. The flow capacity of the Moses-Saunders Dam was reduced at times due to turbine and transmission maintenance outages and/or electricity market conditions. Long Sault Dam was operated intermittently on 53 of the 181 days of the reporting period (approximately 30 percent of the time). The total daily amount of water spilled (not available for electrical power generation) reached a maximum daily mean value of 1,211 m^3/s on February 28, 2023.

2.6 Raisin River Diversion

The Raisin River Diversion remained closed throughout the reporting period.

2.7 St. Lawrence Seaway Report

The 2022 navigation season closed in the Montreal-Lake Ontario section of the Seaway after the last down bound vessel, the bulk carrier *KAMINISTIQUA*, cleared the St. Lambert Lock at 22:07 hours on January 1, 2023. The 2023 navigation season is scheduled to open in the Montreal-Lake Ontario section of the Seaway on March 22, 2023.

2.8 Hydropower Peaking and Ponding

Peaking and ponding operations are the within-day and day-to-day flow variations, respectively, that enable Ontario Power Generation and New York Power Authority to better align their electricity production with demand. However, these outflow variations cause water levels immediately upstream and downstream of the Moses-Saunders Dam to fluctuate more than they otherwise would. The IJC has approved guidelines and conditions within which the hydropower entities may conduct peaking and ponding operations. On November 30, 2021, the IJC approved the continuation of peaking and ponding operations for the 5-year period from December 1, 2021 to November 30, 2026 in accordance with the conditions specified in Addendum No. 3 to the Operational Guides for Regulation Plan 1958-D. Peaking

and ponding operations are only conducted if there is full concurrence from the Board and Operations Advisory Group.

One of the conditions is that variations in flows due to peaking and ponding operations shall not result in hourly flows in excess of 7,930 m^3/s. Peaking and ponding operations were authorized and conducted for most of the reporting period while flows were below the allowable 7,930 m^3/s threshold. Peaking and ponding operations were not conducted during the minor deviation in October, when the flow was temporarily reduced to raise water levels on Lake St. Lawrence to facilitate the removal of recreational boats from Lake St. Lawrence. Additionally, peaking and ponding operations were generally not conducted during the winter months when the flow was frequently adjusted to promote ice formation and maintain the stability and integrity of the ice covers in the Beauharnois Canal and on Lake St. Lawrence.

3 BOARD ACTIVITIES

The Board continues to direct the outflow from the hydropower project in the international reach of the St. Lawrence River. The Board, primarily through the offices of the regulation representatives, continues to monitor conditions throughout the Lake Ontario-St. Lawrence River system on an ongoing basis. Support staff continue to provide the Board with frequent water level and hydrologic conditions updates, and advise the Board on the impacts that potential outflow management strategies would have on water levels and flows throughout the system under a range of potential water supply scenarios. The Board's Operations Advisory Group (OAG) continues to hold weekly teleconferences to review conditions and advise on weekly operational requirements and constraints and implications of potential outflow management. More information on the roles and responsibilities of the different groups associated with the Board can be found here: https://ijc.org/en/loslrb/lake-ontario-st-lawrence-river-regulation.

The Board continues to communicate regularly with the IJC. As described in Section 3.3, the Board continues to work with the IJC, through the Communications Committee, to seek opportunities to improve communications, outreach, and engagement with its stakeholders and the public. As described in Section 3.4, the St. Lawrence Committee on River Gauging continues to monitor the power entities' program for operation and maintenance of the gauging system required for Board operations.

3.1 BOARD MEETINGS & CONFERENCE CALLS

The Board met in person once and remotely via videoconference four times during the reporting period, along with IJC advisors, associated subcommittees, advisory groups and support staff, to conduct business and assess conditions. Two of these meetings were joint workshops with the Great Lakes Adaptive Management Committee. Table 4 provides a list of Board Members in attendance at these meetings.

3.2 BOARD MEMBERSHIP CHANGES

There were no changes to the Board membership during the reporting period.

3.3 COMMUNICATIONS, OUTREACH AND ENGAGEMENT

The Communications Committee continued to meet regularly, engage in initiatives, and develop products to accomplish its strategic communication goals. The committee, individual Board and IAG members,

secretaries, regulation representatives, and other support staff remained actively engaged in outreach, information exchange and liaison with members of the public, legislators, government agencies, journalists, and other stakeholders throughout the Lake Ontario-St. Lawrence River system.

During the reporting period, a total of four media releases were published, distributed, and posted on the Board's website in both French and English. Board members and support staff responded to a number of telephone, email and Board webpage contact form inquiries concerning water supply conditions, water levels and outflow management strategies. Board members and staff conducted numerous interviews with the media and maintained regular contact with media editorial staff.

Board staff continued to send weekly updates to over 600 subscribers (sign up link for the weekly updates can be found here: https://ijc.us2.list-manage.com/subscribe?u=6f596332b572c1092ac6c20a3&id=15d567a8eb. The Board continued to operate and maintain its website (https://www.ijc.org/en/loslrb).

Regular weekly and extra updates on the Board's Facebook pages continued to be posted in both French and English and Board staff responded to over 70 direct message inquiries. The French and English pages currently have over 920 and 7,300 "followers" respectively. The post that had the highest reach on the English page was with the notification of the boat haul out survey and on the French page it was the post about the outflow change notification published on Christmas Eve.

A series of informative videos on topics related to water levels and outflow management were featured on the Board's website and Facebook page in January 2023 in both English and French. The English videos can be viewed here: https://www.ijc.org/en/loslrb/videos .

Board support staff continued to provide weekly and monthly briefings of water levels, flows, and forecasts. The briefings are distributed by email to Board members and associates, and interested stakeholders, including federal, provincial and state government agencies, several Conservation Authorities, Port Authorities, and municipalities.

3.4 GAUGING COMMITTEE

The St. Lawrence Committee on River Gauging (Gauging Committee) is granted authority by the Board to oversee and ensure the accuracy of flow estimates and water level measurements in the international section of the St. Lawrence River. The Gauging Committee inspects the computational methods employed at each of the outflow structures and monitors the operation and maintenance of the water level gauges owned and operated by the power entities (OPG and NYPA). The committee conducts an annual field inspection of 16 of the water level gauges used by the Board to monitor river conditions and performs monthly audits of the water level and outflow data collected and archived by the power entities. The findings and results of these activities are documented in an annual report to the Board.

The Gauging Committee's annual field inspection was not completed in 2022 due to the COVID-19 pandemic and associated travel restrictions. However, field surveys and all required weekly checks and quarterly maintenance activities were still completed as usual by OPG and NYPA. Committee representatives reviewed the survey and maintenance reports prepared by OPG and NYPA and no major issues were identified.

4 GREAT LAKES–ST. LAWRENCE RIVER ADAPTIVE MANAGEMENT COMMITTEE

The Great Lakes – St. Lawrence River Adaptive Management (GLAM) Committee is a committee of technical experts, established by the IJC, and under the authority of the Boards, to consider adaptive management methods as part of an on-going evaluation of outflow regulation plans. The GLAM Committee continues to work with the Boards to evaluate the science-based recommendations of past studies and develop new recommendations. The Committee ultimately seeks to evaluate outflow regulation plan performance over time with regard to a broad range of environmental and economic indicators. The GLAM Committee will support the Board in evaluating whether adjustments to Plan 2014 might make sense and what recommendations should be made to the IJC. Any proposed changes to Plan 2014 would then need to be approved by the IJC and agreed to by the Governments of Canada and the United States. Updates and detailed reports of GLAM activities can be found on the GLAM Committee's website (https://www.ijc.org/en/glam).

The GLAM Committee moved forward with Phase 2 of the expedited review of Plan 2014 during the reporting period. A key component was the preparation of an overall Phase 2 strategy document. The document will be refined throughout Phase 2 and provides general guidance on the overall study strategy and how information will be used to inform decisions made by the International Lake Ontario-St. Lawrence River Board at the end of the review. The draft document was presented to the Board as part of a January 2023 workshop and the Board had a chance to review the document prior to it being sent to the peer review team for their feedback. The GLAM Committee also drafted and sought approval of its FY23 work plan during the reporting period. The work plan is consistent with the overall Phase 2 strategy and identifies the priority tasks for the various technical teams that were established to align with the Adaptive Management framework outlined in the committee's short and long-term strategy document. The work plan will guide efforts through September 2023 and beyond and includes components related to hydroclimate, plan simulation, socio-economic and environmental impacts, as well as plan review and decision support.

During the reporting period, the hydroclimate team consolidated critical datasets necessary to simulate water level and flow conditions for historical water supply conditions as well as statistical and climate change representations of possible future conditions. Meanwhile, the plan simulation team worked to ensure updates were undertaken for tools needed to model alternative regulation strategies that will be compared to Plan 2014 simulations as part of the Phase 2 effort.

A foundational aspect of the Phase 2 expedited review of Plan 2014 is building a model to simulate potential benefits and impacts associated with alternative water regulation scenarios. Over the past number of months, the GLAM Committee established the basic components of the model, referred to as the Integrated Social, Economic and Environmental System (ISEE). Similar tools have been developed for past IJC transboundary studies including most recently for the Lake Champlain-Richelieu River Study. The ISEE integrates water level and flow simulations with impact functions to model potential outcomes for key performance indicators. These indicators are then used to compare alternative regulation scenarios. During the reporting period, the ISEE development focused on refining the key input elevation datasets as well as the hydrodynamic components and background coding. In the meantime, work was initiated to develop relevant performance indicators related to municipal and industrial water uses,

commercial navigation, hydropower, shoreline uses, ecosystem and recreational boating and tourism for use in the model. Planning for ongoing outreach with Indigenous communities also occurred. All of this work will continue through early 2024 as the ISEE is further refined and improved.

Table 1: Provisional Monthly Mean Supplies to Lake Ontario

Month	Inflow from Lake Erie				Local Net Basin Supplies			Total Supplies			
	m^3/s	tcfs	Exceedance Probability[(1)]	Percent of Long-term Average [(1)]	m^3/s	tcfs	Exceedance Probability[(1)]	m^3/s	tcfs	Exceedance Probability[(1)]	Percent of Long-term Average [(1)]
September 2022	6,520	230	22	109	-310	-11	87	6,210	219	42	101
October 2022	6,360	225	25	107	-170	-6	82	6,190	219	48	100
November 2022	6,450	228	21	109	610	22	49	7,060	249	30	108
December 2022	6,510	230	19	110	1,310	46	23	7,820	276	18	116
January 2023	6,500	230	16	113	2,200	78	4	8,700	307	5	129
February 2023	6,620	234	10	117	1,700	60	16	8,320	294	8	124
6-month Average	6,490	229	17	111	890	31	25	7,380	261	16	113

[(1)] Based on period of record 1900-2021

Table 2a: Summary of Weekly Outflows, Operational Adjustments and Deviations

Week Ending 2022	Adj. RC Flow		Plan Flow		App. Rule/ Limit	Actual Flow		Op. Adjustments &/or Plan Limitations		Deviations							Details
										Weekly		Accumulated		Cumulative effect on L. Ontario		Type	
	m^3/s	tcfs	m^3/s	tcfs		m^3/s	tcfs	m^3/s	tcfs	m^3/s	tcfs	m^3/s-wks	tcfs-wks	cm	in		
2-Sep	7,960	281	7,960	281	RC	7,960	281	0	0	--	--	--	--	--	--	--	Rule Curve
9-Sep	7,870	278	7,670	271	RC/L	7,670	271	-200	-7	--	--	--	--	--	--	--	Operational adjustments to L Limit
16-Sep	7,650	270	7,650	270	RC	7,650	270	0	0	--	--	--	--	--	--	--	Rule Curve
23-Sep	7,600	268	7,600	268	RC	7,600	268	0	0	--	--	--	--	--	--	--	
30-Sep	7,560	267	7,560	267	RC	7,460	263	-100	-4	-100	-3.5	- 100	-3.5	0.3	0.1	Major	Major deviations (Lake Ontario level below criterion H14 low threshold)
7-Oct	7,480	264	7,320	259	RC/L	7,210	255	-270	-9	-110	-3.9	- 210	-7.4	0.7	0.3	Major & Minor	Major deviations; Operational adjustments to L Limit; Minor deviation to facilitate removal of boats from Lake St. Lawrence
14-Oct	7,240	256	6,840	242	L	6,800	240	-440	-16	-40	-1.4	- 250	-8.8	0.8	0.3	Minor	Minor deviation to facilitate removal of recreational boats from Lake St. Lawrence
21-Oct	7,200	254	6,560	232	L	6,660	235	-540	-19	100	3.5	- 150	-5.3	0.5	0.2	Minor & Major	Offset minor deviations and begin offsetting major deviations
28-Oct	7,230	255	6,660	235	L	6,660	235	-570	-20	--	--	- 150	-5.3	0.5	0.2	--	L Limit
4-Nov	7,240	256	6,660	235	L	6,660	235	-580	-21	--	--	- 150	-5.3	0.5	0.2	--	
11-Nov	7,120	251	6,500	230	L/M	6,500	230	-620	-21	--	--	- 150	-5.3	0.5	0.2	--	L Limit; Operational adjustments for M Limit
18-Nov	7,040	249	6,390	226	M/L	6,390	226	-650	-23	--	--	- 150	-5.3	0.5	0.2	--	
25-Nov	7,180	254	6,840	242	L	6,840	242	-340	-12	--	--	- 150	-5.3	0.5	0.2	--	L Limit
2-Dec	7,080	250	6,750	238	L	6,750	238	-330	-12	--	--	- 150	-5.3	0.5	0.2	--	
9-Dec	7,180	254	7,020	248	L	7,020	248	-160	-6	--	--	- 150	-5.3	0.5	0.2	--	
16-Dec	7,200	254	7,120	251	L/RC	7,120	251	-80	-3	--	--	- 150	-5.3	0.5	0.2	--	Operational adjustment to L Limit
23-Dec	7,080	250	7,080	250	RC	7,110	251	30	1	30	1.1	- 120	-4.2	0.4	0.2	Major	Resume offsetting major deviations
30-Dec	7,110	251	7,110	251	RC	7,320	259	210	8	210	7.4	90	3.2	-0.3	-0.1	Major & Minor	Continue offsetting major deviations; Minor deviation to mitigate high water levels in the upper St. Lawrence River and loss of Hydro-Quebec transmission lines

Note: The "Op. Adjustments &/or Plan Limitations" column values shown in this table are computed as the Actual Flow minus Adjusted RC Flow.

Table 2a (continued): Summary of Weekly Outflows, Operational Adjustments and Deviations

Week Ending 2023	Adj. RC Flow		Plan Flow		App. Rule/ Limit	Actual Flow		Op. Adjustments &/or Plan Limitations		Deviations							Details
										Weekly		Accumulated		Cumulative effect on L. Ontario		Type	
	m^3/s	tcfs	m^3/s	tcfs		m^3/s	tcfs	m^3/s	tcfs	m^3/s	tcfs	m^3/s-wks	tcfs-wks	cm	in		
6-Jan	7,300	258	7,300	258	RC	7,210	255	-90	-3	-90	-3.2	0	0	0	0	Minor	Offsetting minor deviation
13-Jan	7,490	265	7,490	265	RC	7,490	265	0	0	--	--	--	--	--	--	--	Rule Curve
20-Jan	7,600	268	7,600	268	RC	7,600	268	0	0	--	--	--	--	--	--	--	
27-Jan	7,620	269	7,580	268	I	7,580	268	-40	-1	--	--	--	--	--	--	--	Operational adjustments for ice management
3-Feb	7,700	272	7,260	256	I	7,260	256	-440	-16	--	--	--	--	--	--	--	
10-Feb	7,720	273	6,960	246	I	6,960	246	-760	-27	--	--	--	--	--	--	--	
17-Feb	7,720	273	7,660	271	J	7,660	271	-60	-2	--	--	--	--	--	--	--	J Limit
24-Feb	7,940	280	7,720	273	I	7,720	273	-220	-7	--	--	--	--	--	--	--	Operational adjustments for ice management
3-Mar	7,950	281	7,370	260	I	7,370	260	-580	-21	--	--	--	--	--	--	--	

Note: The “Op. Adjustments &/or Plan Limitations” column values shown in this table are computed as the Actual Flow minus Adjusted RC Flow.

Table 2b: Summary of Flow Changes

Week Ending 2022	Flow Changes								Details
	Day	Hr	(m^3/s)		(tcfs)		Reason	App. Rule/ Limit	
			From	To	From	To			
9-Sep	3-Sep	0001	7,960	7,870	281.1	277.9	Plan	RC	Rule Curve
	5-Sep	2201	7,870	7,550	277.9	266.6	OA	L	Operational adjustments to L Limit (maintain minimum Lake St. Lawrence level of 72.60 m)
	6-Sep	1501	7,550	7,300	266.6	257.8	OA	L	
	7-Sep	1101	7,300	7,550	257.8	266.6	OA	L	
	8-Sep	1501	7,550	7,650	266.6	270.2	OA	L	
23-Sep	17-Sep	0001	7,650	7,600	270.2	268.4	Plan	RC	Rule Curve
30-Sep	24-Sep	0001	7,600	7,460	268.4	263.4	Dev	Major	Major deviations (Lake Ontario level below criterion H14 low threshold)
7-Oct	1-Oct	0001	7,460	7,380	263.4	260.6	Dev	Major	
	2-Oct	2001	7,380	7,000	260.6	247.2	OA	L	Operational adjustments to L Limit (maintain minimum Lake St. Lawrence level of 72.60 m)
	4-Oct	1601	7,000	7,180	247.2	253.6	OA	L	
	5-Oct	1201	7,180	7,380	253.6	260.6	Dev	Major	Major deviations (criterion H14 low threshold)
	7-Oct	1201	7,380	7,000	260.6	247.2	Dev	Minor	Minor deviation to facilitate removal of recreational boats from Lake St. Lawrence
	7-Oct	1301	7,000	6,740	247.2	238	Dev	Minor	
14-Oct	10-Oct	1201	6,740	6,840	238	241.6	Plan	L	Return to Plan 2014 flow (L Limit)
21-Oct	15-Oct	0001	6,840	6,660	241.6	235.2	Dev	Minor & Major	Offset minor deviations and begin offsetting major deviations
11-Nov	5-Nov	0001	6,660	6,470	235.2	228.5	Plan	L	L Limit
	9-Nov	1901	6,470	6,570	228.5	232	OA	M	Operational adjustment for M Limit
18-Nov	12-Nov	1201	6,570	6,380	232	225.3	OA	L	Operational adjustment to L Limit
25-Nov	19-Nov	0001	6,380	6,840	225.3	241.6	Plan	L	L Limit
2-Dec	26-Nov	0001	6,840	6,750	241.6	238.4	Plan	L	
9-Dec	3-Dec	0001	6,750	7,020	238.4	247.9	Plan	L	
16-Dec	10-Dec	0001	7,020	7,200	247.9	254.3	Plan	RC/L	Rule Curve and L Limit are equivalent
	11-Dec	1201	7,200	6,700	254.3	236.6	OA	L	Operational adjustment to L Limit (maintain minimum Lake St. Lawrence level of 72.60 m)
	12-Dec	1401	6,700	7,200	236.6	254.3	Plan	RC/L	Rule Curve and L Limit are equivalent
23-Dec	17-Dec	0001	7,200	7,110	254.3	251.1	Dev	Major	Resume offsetting major deviations
30-Dec	24-Dec	0001	7,110	7,200	251.1	254.3	Dev	Major	
	24-Dec	1901	7,200	7,500	254.3	264.9	Dev	Minor	Minor deviation to mitigate high water levels in the upper St. Lawrence River and loss of Hydro-Quebec transmission lines during high winds
	27-Dec	1401	7,500	7,200	264.9	254.3	Dev	Minor	

Table 2b (continued): Summary of Flow Changes

Week Ending 2023	Flow Changes								Details
	Day	Hr	(m^3/s)		(tcfs)		Reason	App. Rule/ Limit	
			From	To	From	To			
6-Jan	31-Dec	0001	7,200	7,210	254.3	254.6	Dev	Minor	Offsetting minor deviation
13-Jan	7-Jan	0001	7,210	7,490	254.6	264.5	Plan	RC	Rule Curve
20-Jan	14-Jan	0001	7,490	7,600	264.5	268.4	Plan	RC	
27-Jan	21-Jan	0001	7,600	7,620	268.4	269.1	Plan	RC	
	27-Jan	1401	7,620	7,000	269.1	247.2	OA	I	Operational adjustments for ice management (Beauharnois Canal)
3-Feb	29-Jan	1201	7,000	7,500	247.2	264.9	OA	I	
	30-Jan	1301	7,500	7,700	264.9	271.9	OA	RC	
	31-Jan	2001	7,700	7,000	271.9	247.2	OA	I	
	1-Feb	1901	7,000	7,700	247.2	271.9	OA	RC	
	2-Feb	1701	7,700	6,800	271.9	240.1	OA	I	
10-Feb	4-Feb	1901	6,800	6,600	240.1	233.1	OA	I	Operational adjustments for ice management (Beauharnois Canal and Lake St. Lawrence)
	7-Feb	1201	6,600	7,000	233.1	247.2	OA	I	
	8-Feb	1501	7,000	7,400	247.2	261.3	OA	I	
17-Feb	11-Feb	0001	7,400	7,660	261.3	270.5	Plan	J	J Limit
24-Feb	18-Feb	0001	7,660	7,940	270.5	280.4	Plan	RC	Rule Curve
	22-Feb	2001	7,940	7,300	280.4	257.8	OA	I	Operational adjustments for ice management (Beauharnois Canal)
	24-Feb	1801	7,300	6,800	257.8	240.1	OA	I	
	24-Feb	2101	6,800	6,600	240.1	233.1	OA	I	
3-Mar	27-Feb	1601	6,600	7,400	233.1	261.3	OA	I	Operational adjustment for ice management (Beauharnois Canal and Lake St. Lawrence)
	28-Feb	1201	7,400	7,950	261.3	280.8	OA	RC	Operational adjustment to Rule Curve

Table 3: Lake Ontario Recorded and Preproject Water Levels and Outflows

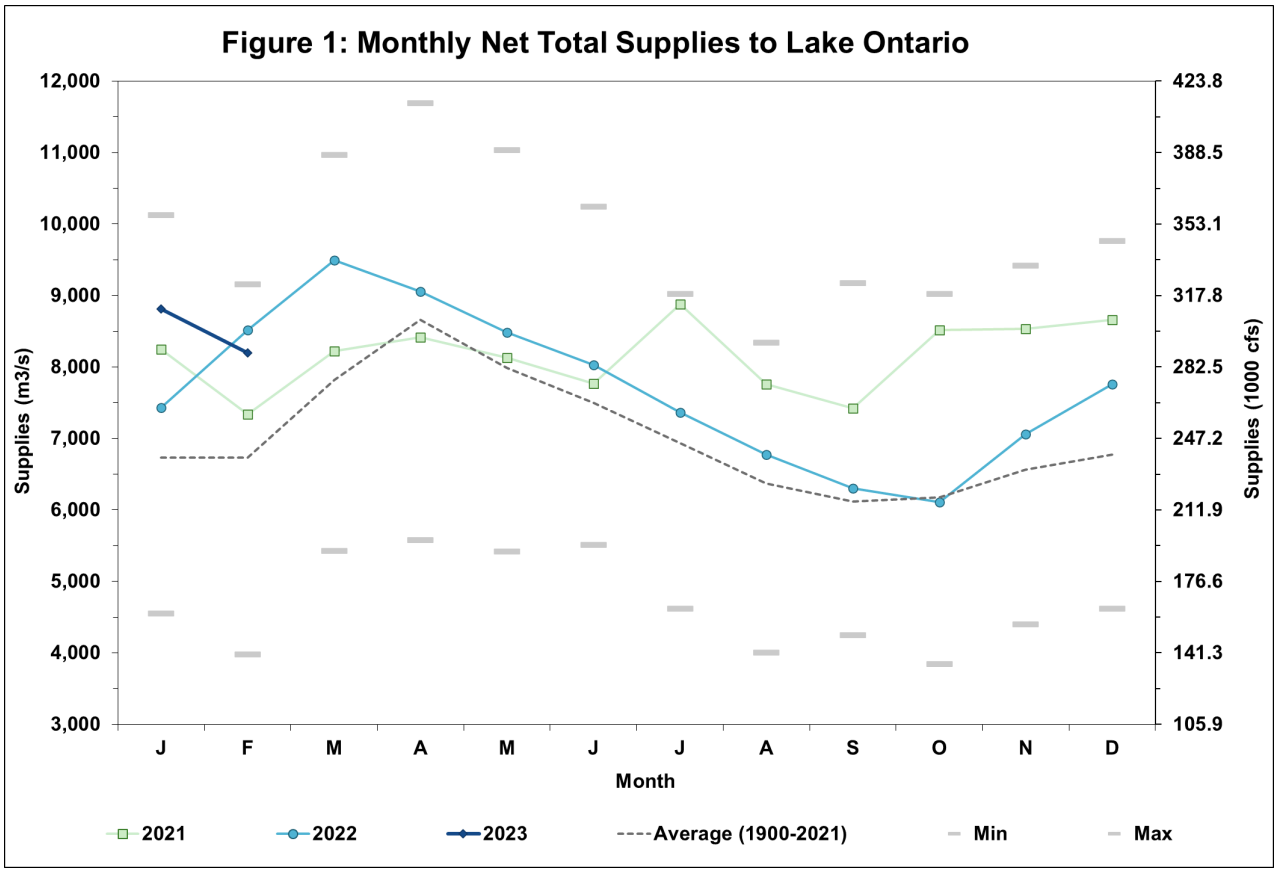
Month	Lake Ontario Monthly Mean Water Levels (IGLD 1985) - meters (feet)			Lake Ontario Monthly Mean Outflow m^3/s (tcfs)		
	Recorded	Preproject	Difference	Recorded	Preproject	Difference
September 2022	74.55 (244.58)	75.28 (246.98)	-0.73 (-2.40)	7,620 (269)	7,630 (269)	-10 (-0.3)
October 2022	74.41 (244.12)	75.10 (246.39)	-0.69 (-2.27)	6,820 (241)	7,280 (257)	-460 (-16)
November 2022	74.40 (244.09)	75.03 (246.16)	-0.63 (-2.07)	6,620 (234)	7,140 (252)	-520 (-18)
December 2022	74.47 (244.32)	75.06 (246.26)	-0.59 (-1.94)	7,120 (251)	7,190 (254)	-70 (-3)
January 2023	74.65 (244.91)	75.22 (246.78)	-0.57 (-1.87)	7,460 (263)	7,500 (265)	-40 (-2)
February 2023	74.76 (245.27)	75.32 (247.11)	-0.56 (-1.84)	7,340 (259)	7,650 (270)	-310 (-11)

Table 4: Attendance at Meetings

Member	Sep 9	Sep 28	Dec 20
BG K. Peeples[1]	X	X	X
Mr. K. McCune[2]	X	X	X
Mr. D. Harper[3]	X	X	X
Mr. T. Brown	X	X	X
Ms. P. Clavet	X	X	X
Mr. A. David	X	X	X
Ms. J. Frain	X	X	X

Notes:

1. US Co-Chair
2. US Alternate Chair
3. Canadian Co-Chair



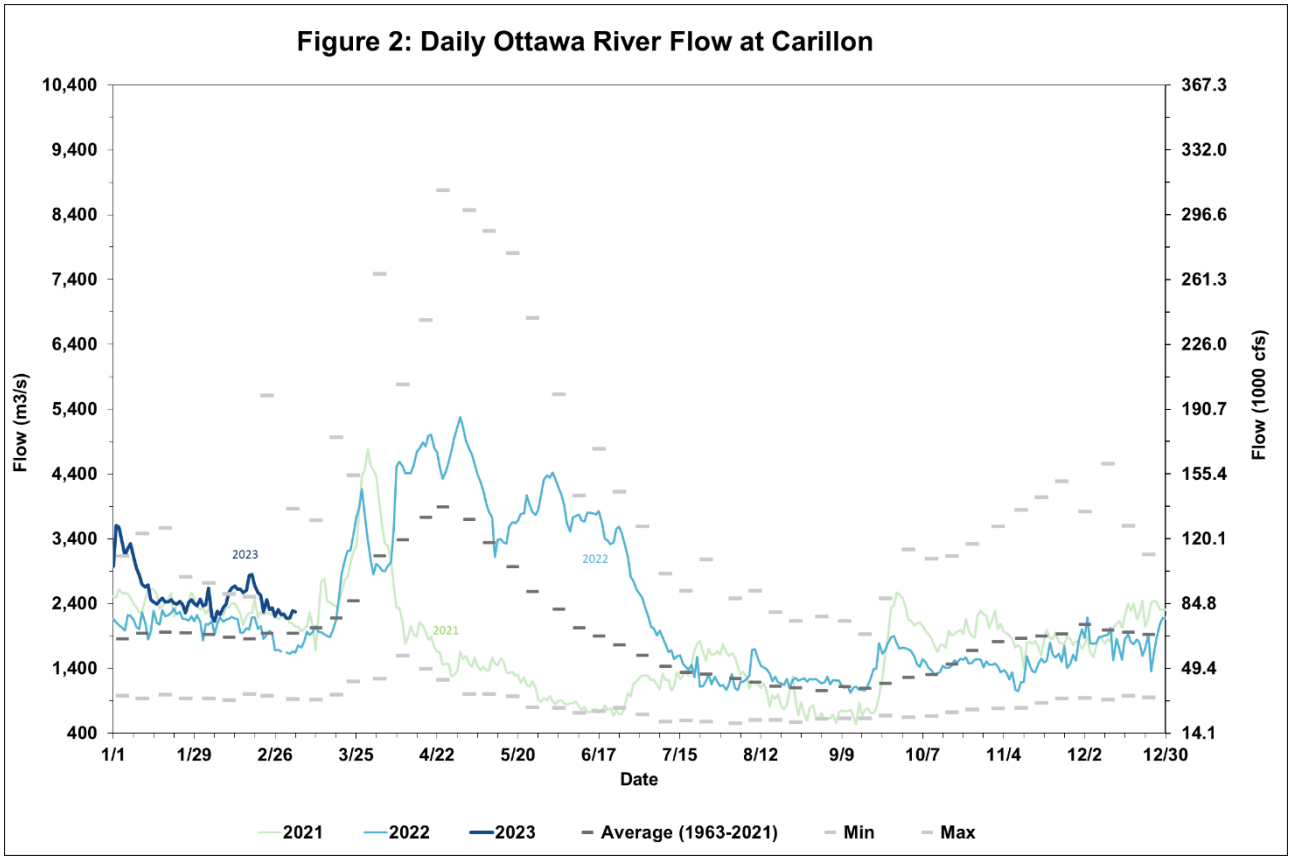


Figure 2: Daily Ottawa River Flow at Carillon
Flow (m3/s)
Flow (1000 cfs)
10,400
9,400
8,400
7,400
6,400
5,400
4,400
3,400
2,400
1,400
400
367.3
332.0
296.6
261.3
226.0
190.7
155.4
120.1
84.8
49.4
14.1
2023
2022
2021
1/1
1/29
2/26
3/25
4/22
5/20
6/17
7/15
8/12
9/9
10/7
11/4
12/2
12/30
Date
2021
2022
2023
Average (1963-2021)
Min
Max

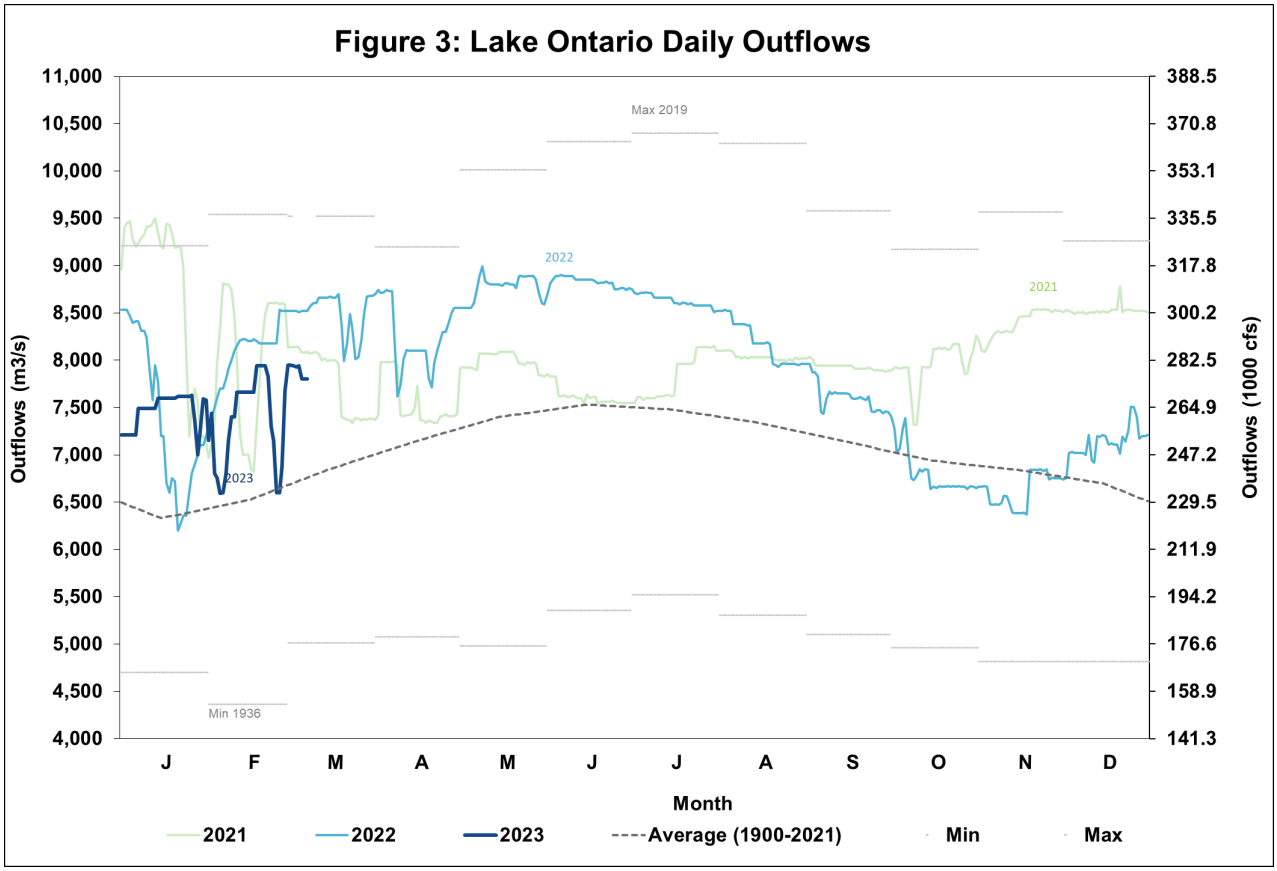


Figure 3: Lake Ontario Daily Outflows
Outflows (m3/s)
Outflows (1000 cfs)
11,000
10,500
10,000
9,500
9,000
8,500
8,000
7,500
7,000
6,500
6,000
5,500
5,000
4,500
4,000
388.5
370.8
353.1
335.5
317.8
300.2
282.5
264.9
247.2
229.5
211.9
194.2
176.6
158.9
141.3
Max 2019
2022
2021
2023
Min 1936
J
F
M
A
M
J
J
A
S
O
N
D
Month
2021
2022
2023
Average (1900-2021)
Min
Max

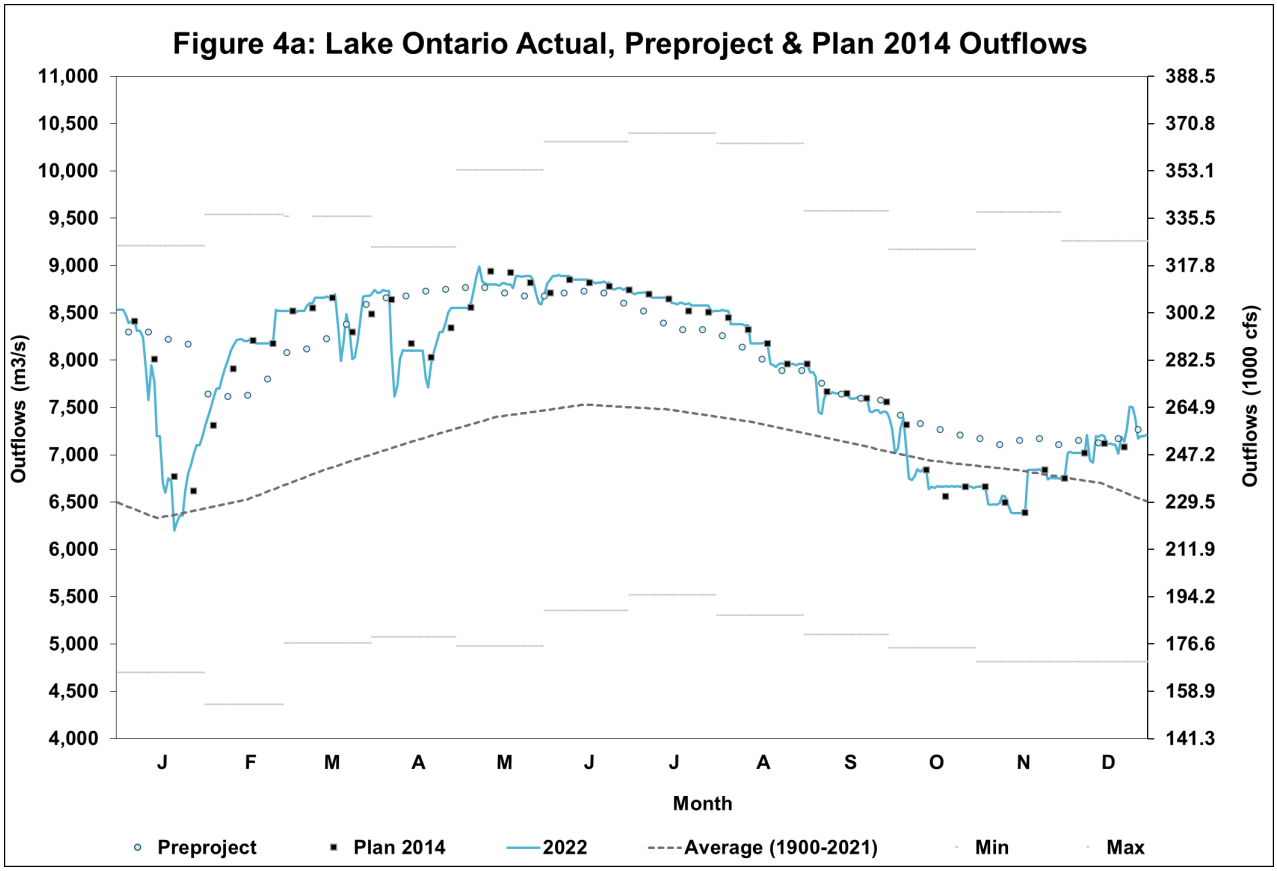


Figure 4a: Lake Ontario Actual, Preproject & Plan 2014 Outflows
Outflows (m3/s)
11,000
10,500
10,000
9,500
9,000
8,500
8,000
7,500
7,000
6,500
6,000
5,500
5,000
4,500
4,000
Outflows (1000 cfs)
388.5
370.8
353.1
335.5
317.8
300.2
282.5
264.9
247.2
229.5
211.9
194.2
176.6
158.9
141.3
J F M A M J J A S O N D
Month
Preproject
Plan 2014
2022
Average (1900-2021)
Min
Max

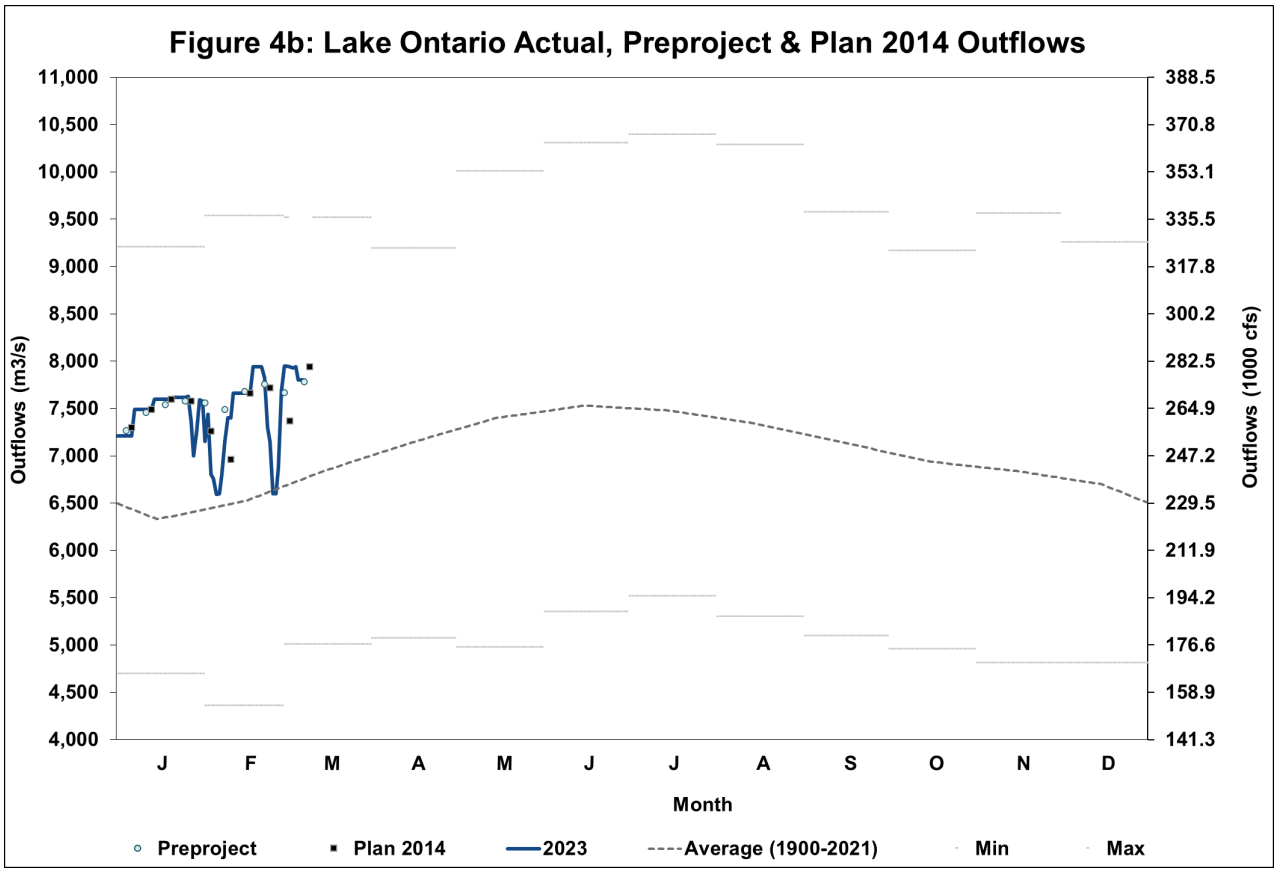


Figure 4b: Lake Ontario Actual, Preproject & Plan 2014 Outflows
Outflows (m3/s)
11,000
10,500
10,000
9,500
9,000
8,500
8,000
7,500
7,000
6,500
6,000
5,500
5,000
4,500
4,000
Outflows (1000 cfs)
388.5
370.8
353.1
335.5
317.8
300.2
282.5
264.9
247.2
229.5
211.9
194.2
176.6
158.9
141.3
J F M A M J J A S O N D
Month
Preproject
Plan 2014
2023
Average (1900-2021)
Min
Max

Figure 5: Daily Lake Ontario Water Levels

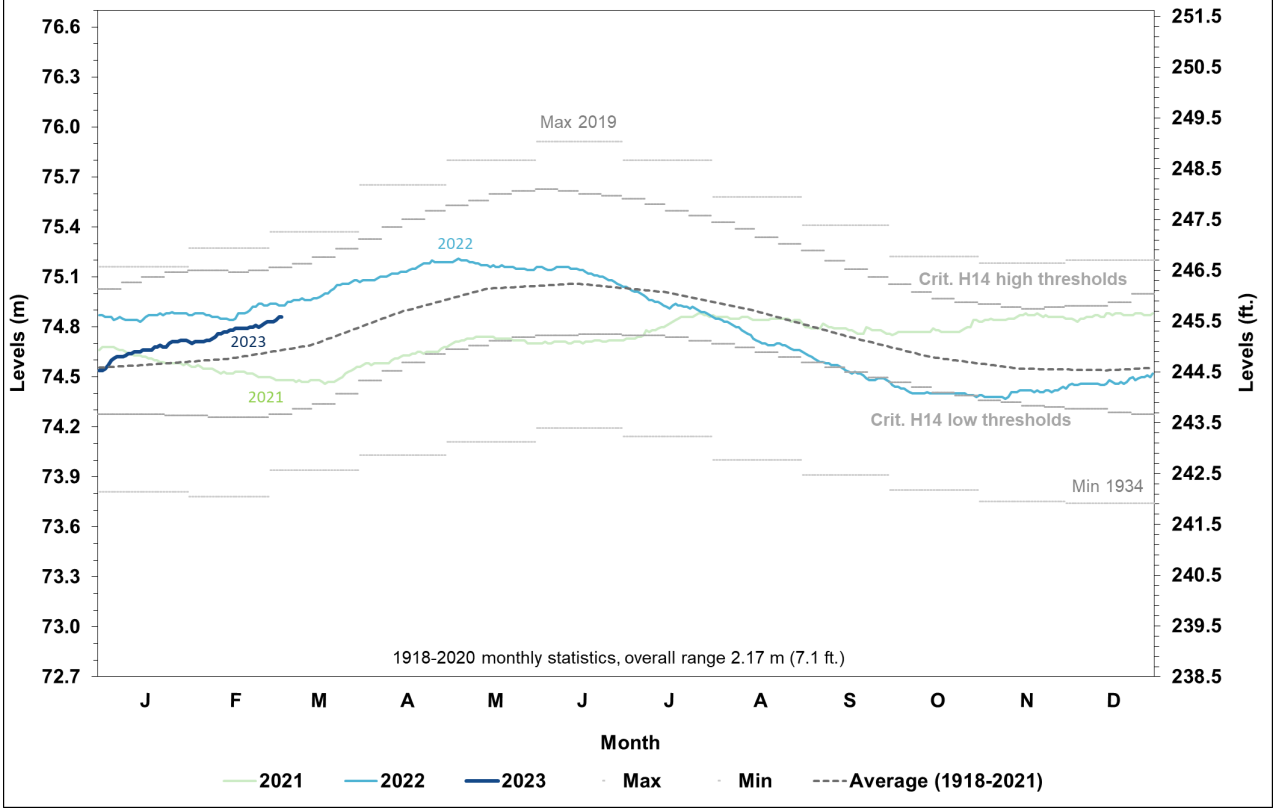


Figure 6a: Lake Ontario Actual, Preproject & Plan 2014 Levels

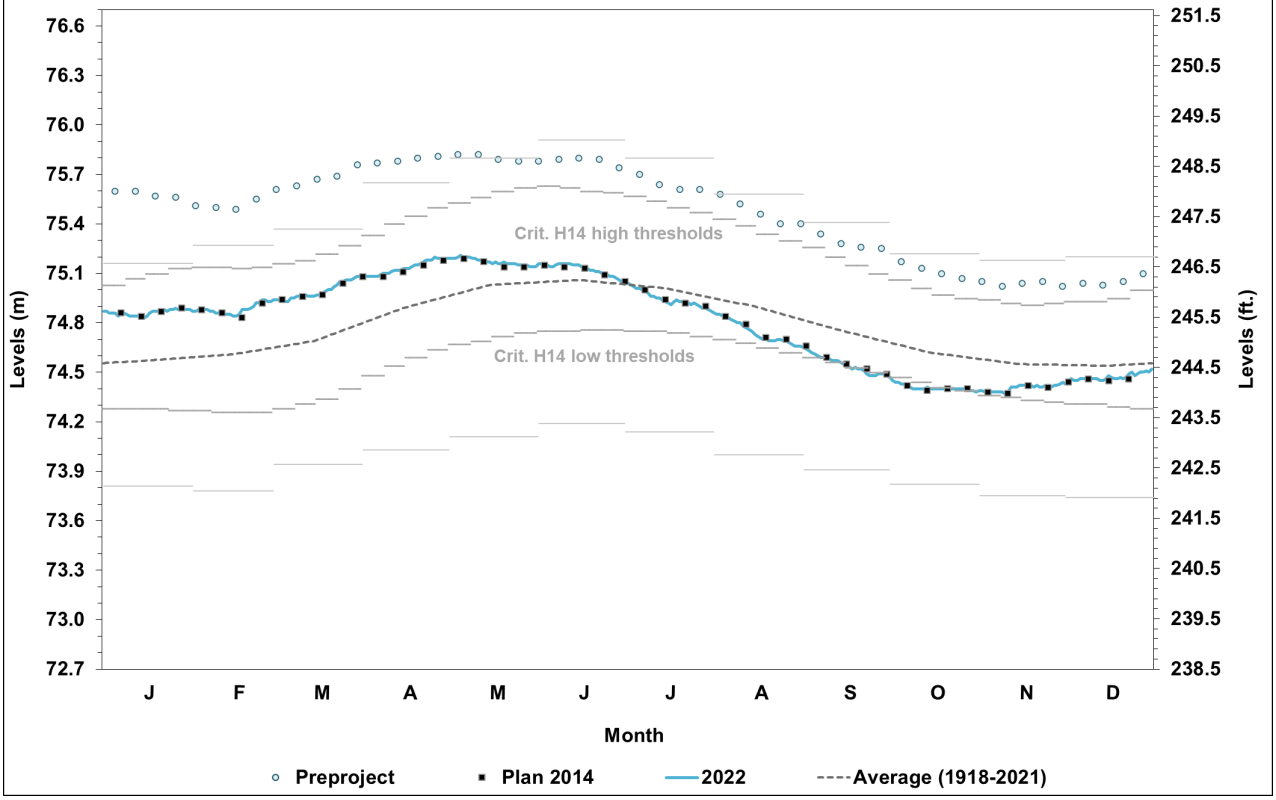


Figure 6b: Lake Ontario Actual, Preproject & Plan 2014 Levels

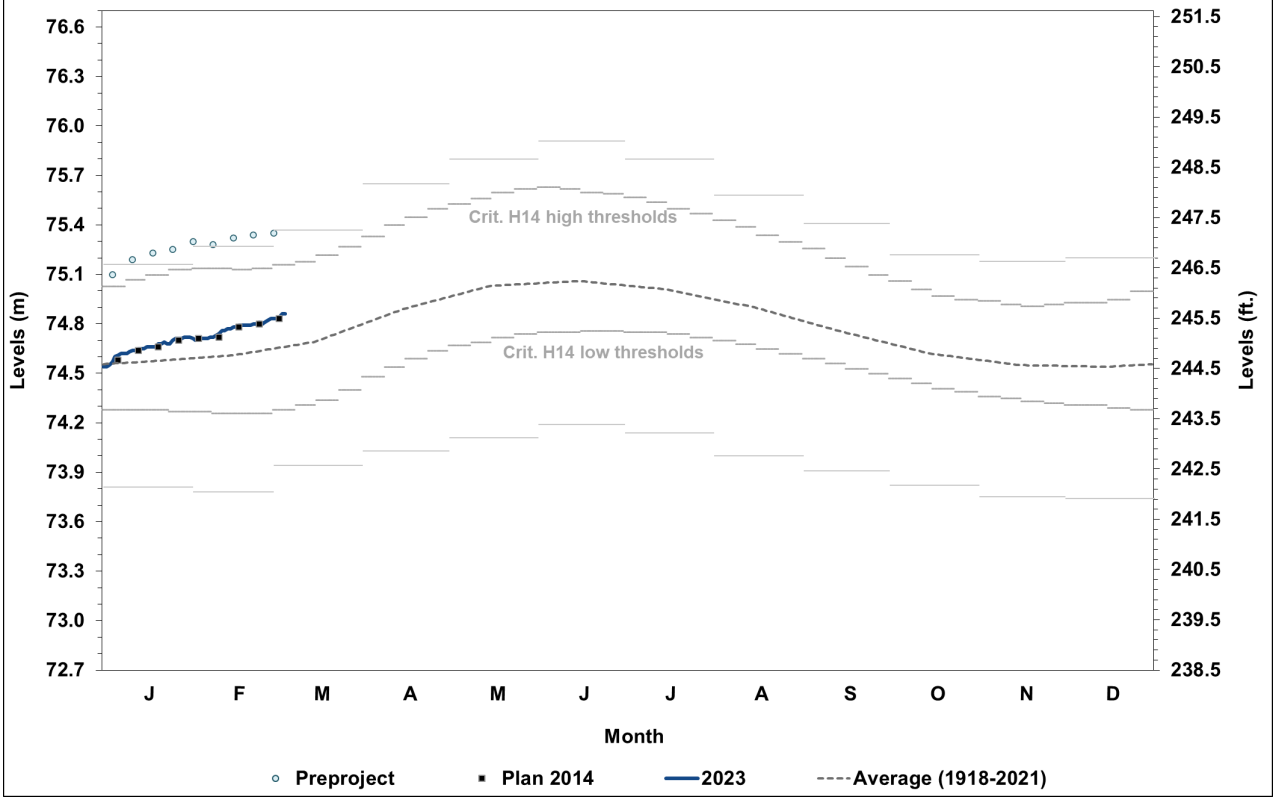


Figure 7: Daily Lake St. Lawrence Levels at Long Sault Dam

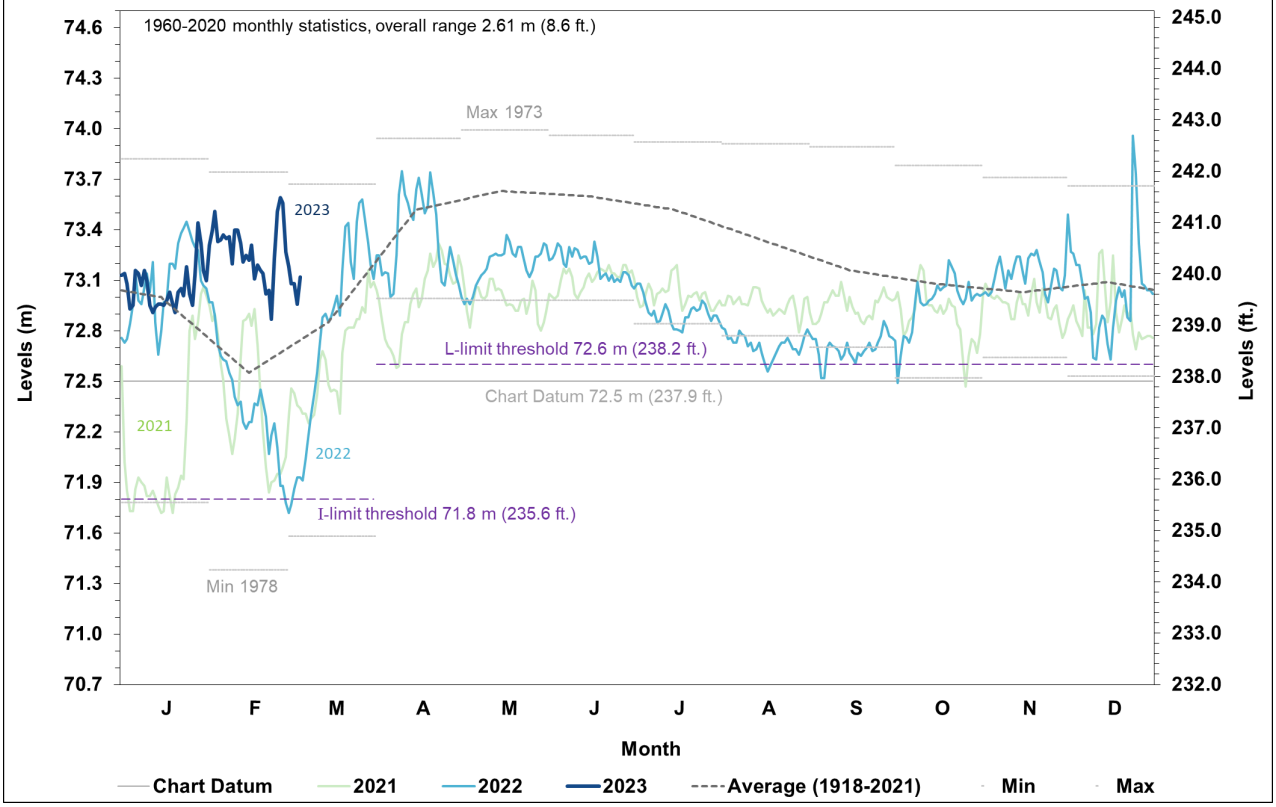


Figure 8: Daily Lake St. Louis Levels at Pointe-Claire

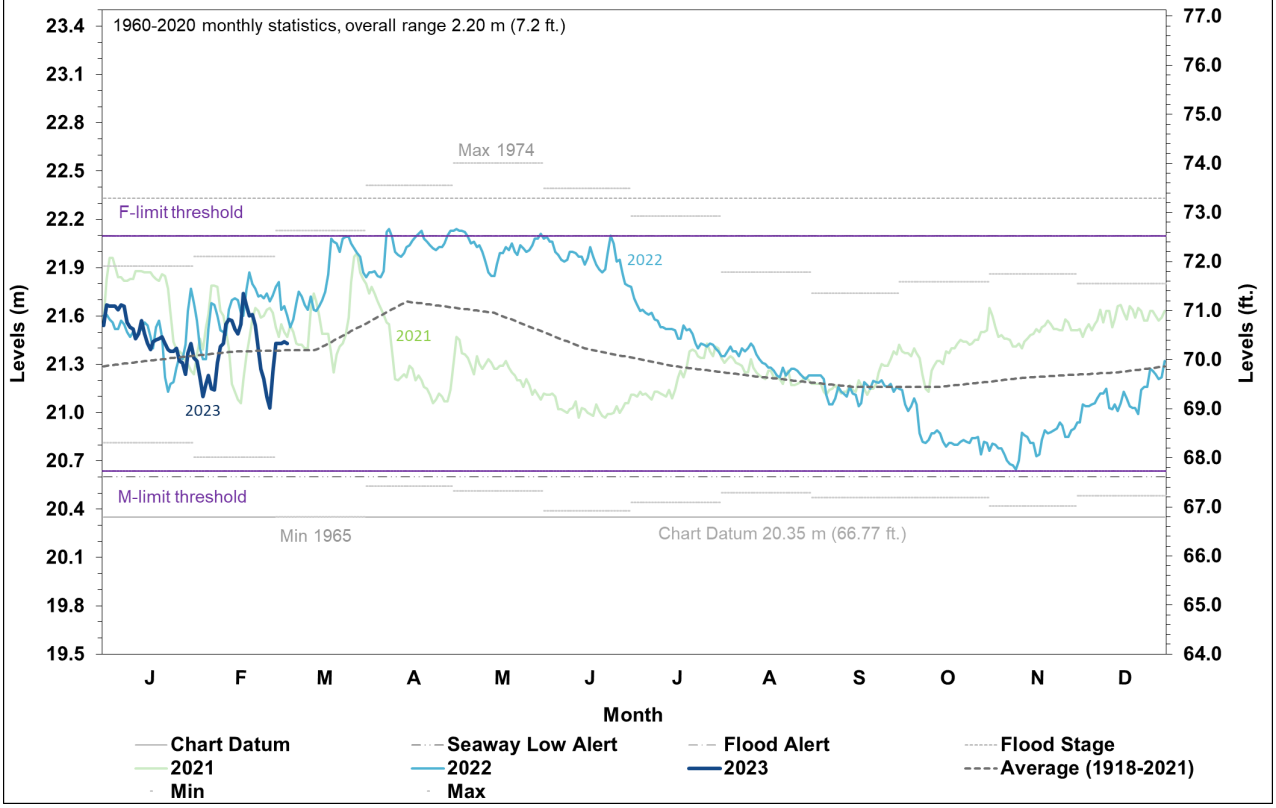
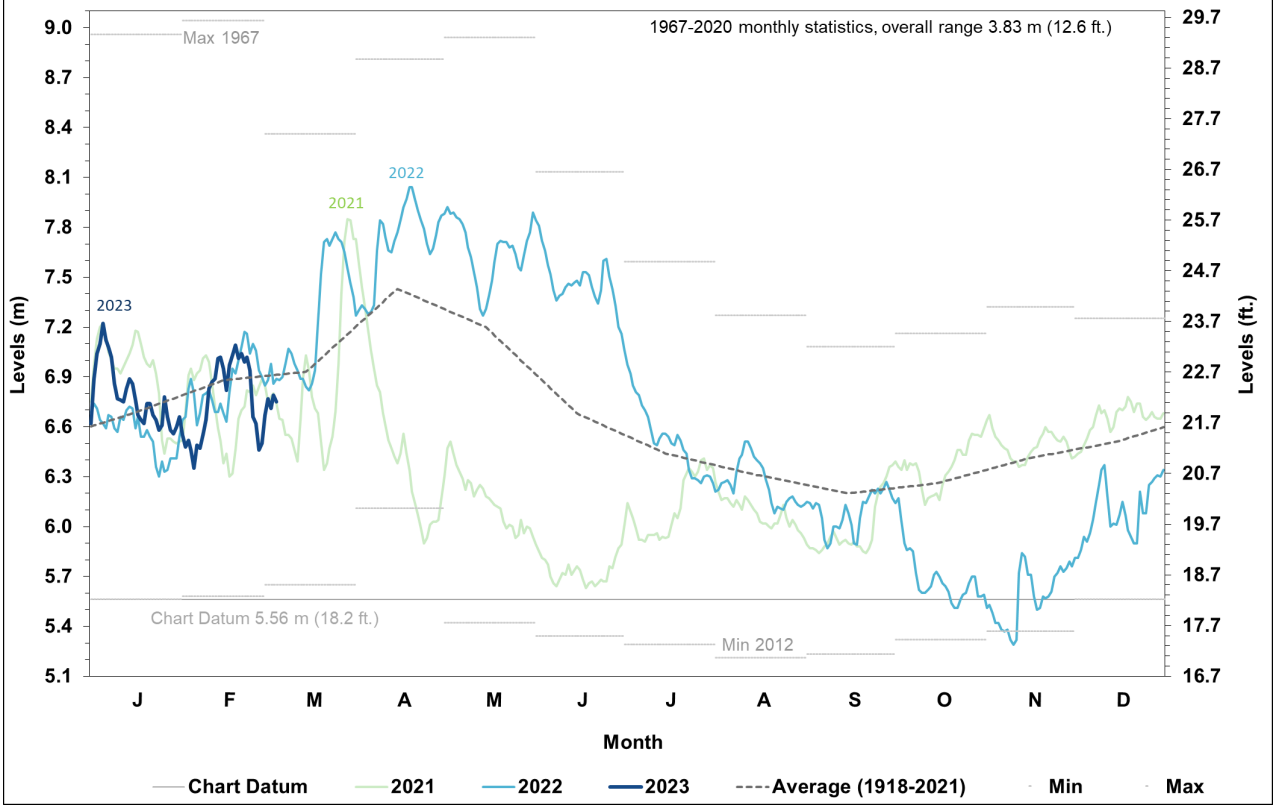


Figure 9: Daily Port of Montreal Levels at Jetty #1



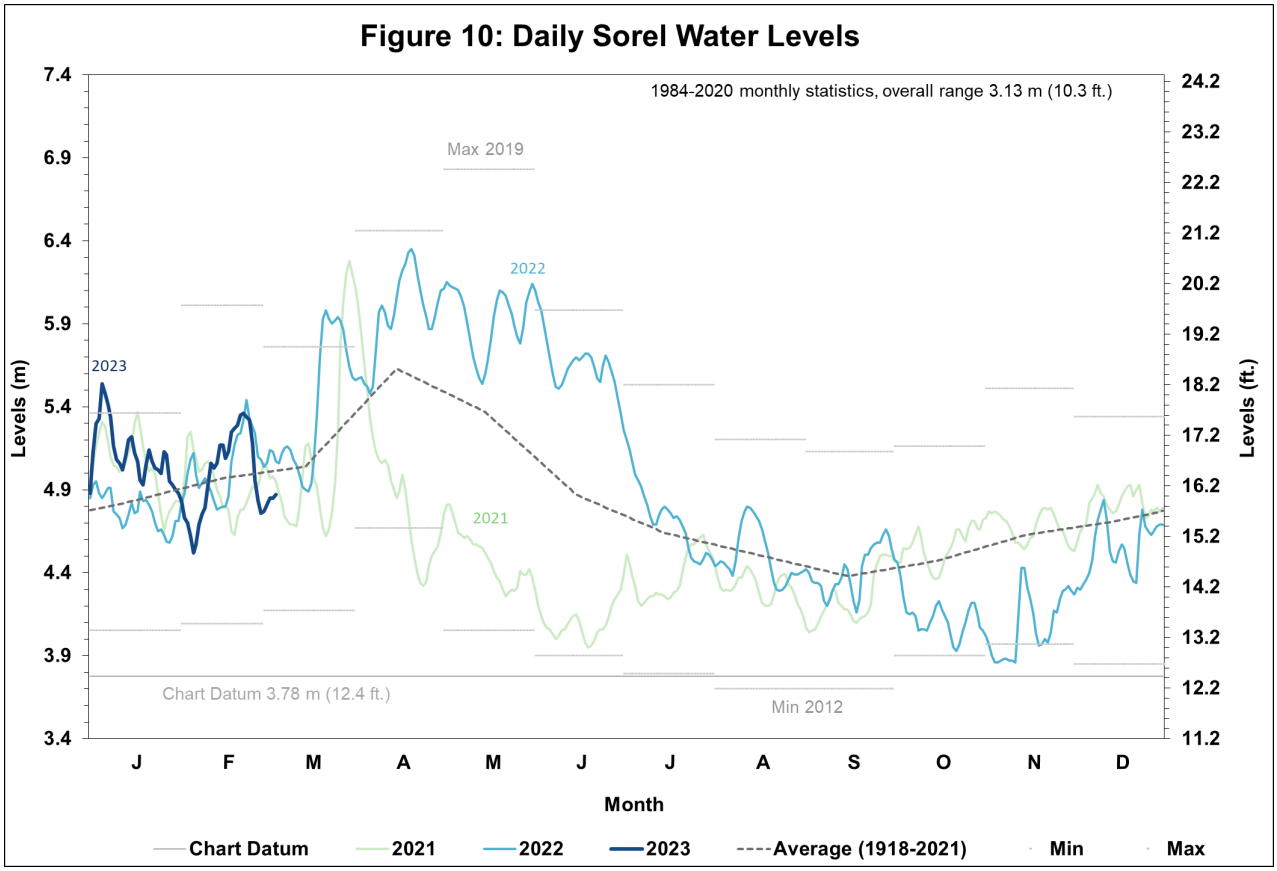


Figure 10: Daily Sorel Water Levels
1984-2020 monthly statistics, overall range 3.13 m (10.3 ft.)
Max 2019
2022
2023
2021
Chart Datum 3.78 m (12.4 ft.)
Min 2012
Levels (m)
Levels (ft.)
7.4
6.9
6.4
5.9
5.4
4.9
4.4
3.9
3.4
24.2
23.2
22.2
21.2
20.2
19.2
18.2
17.2
16.2
15.2
14.2
13.2
12.2
11.2
J
F
M
A
M
J
J
A
S
O
N
D
Month
Chart Datum
2021
2022
2023
Average (1918-2021)
Min
Max