

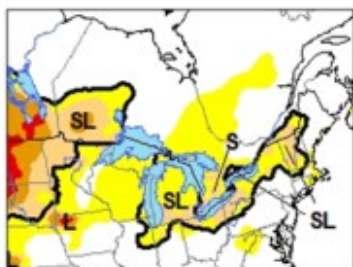
**One Hundred and Thirty-Sixth  
Progress Report to the  
International Joint Commission by the  
International Lake Ontario-St. Lawrence River Board  
Covering the Period  
March 1<sup>st</sup>, 2021 through August 31<sup>st</sup>, 2021**

September 29<sup>th</sup>, 2021

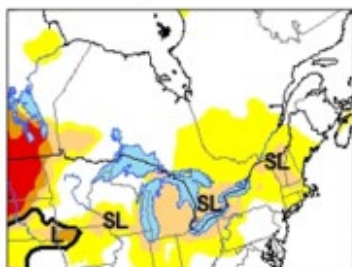
**North American Drought Monitor**

<https://www.ncdc.noaa.gov/temp-and-precip/drought/nadm/maps>

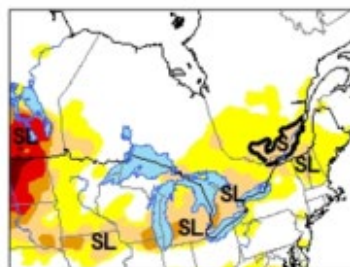
March 31



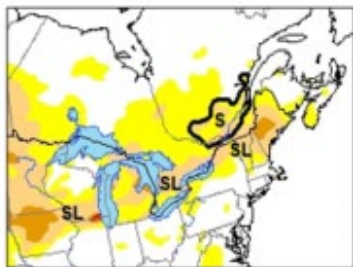
April 30



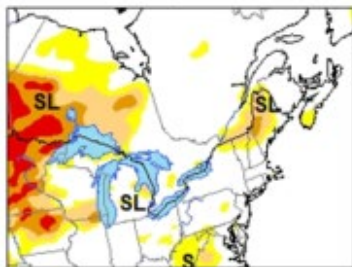
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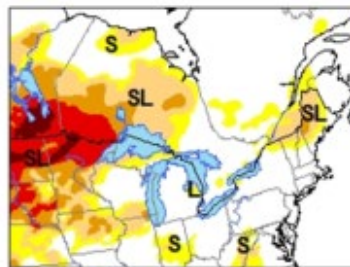
June 30



July 31



August 31



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- Delineates dominant impacts
- S = Short-Term, typically <6 months  
(e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months  
(e.g. hydrology, ecology)

Cover: Snapshots taken from North American Drought Monitor (<https://www.ncdc.noaa.gov/temp-and-precip/drought/nadm/>) at various points throughout the March through August 2021 reporting period

## **EXECUTIVE SUMMARY**

Drought conditions developed in the Lake Ontario-St. Lawrence River system this spring, quickly lowering water levels throughout the system. This relatively rapid shift from the high levels of the past couple years to low levels is unusual but not unprecedented. In December of 2020, the Board was assessing a moderate risk of flooding for the spring of 2021. Due to this risk, the Board sought approval from the IJC to deviate from Plan 2014 prescribed flows under Condition J. Upon approval from the IJC, Condition J gives the Board the authority to temporarily make minor changes to the regulation Plan to test potential operational strategies that may be beneficial to the interests within the system. For more information, please refer to the IJC's 2016 Supplemental [Order of Approval](#).

Under the Condition J authority, the Board deviated over January and February of 2021 and released outflows above those prescribed by Plan 2014. By March 1<sup>st</sup>, the level of Lake Ontario was 9.4 cm (3.7 in.) lower than it would have been if Plan 2014 flows had been released in January and February. Given that the risk of flooding had been significantly reduced, the Board ended its winter deviation strategy on March 1<sup>st</sup>. The Board began offsetting deviations and released outflows below those prescribed by Plan 2014 during March when commercial navigation season began. On April 7<sup>th</sup>, the Board agreed to accelerate the offsetting deviations at a rate of approximately 2 cm (0.8 in.) per week, beginning on April 10<sup>th</sup>. By May 1<sup>st</sup>, all deviations relative to Plan 2014 were fully restored, and the outflow was again set to the applicable Plan 2014 "Rule Curve" flow. In other words, by May 1<sup>st</sup>, the level of Lake Ontario was at the same level it would have been if no deviations had been implemented in January and February of 2021.

The drought conditions caused Lake Ontario levels to have a much smaller seasonal rise in the spring than is typical, and by late May, water levels fell below the applicable low Criterion H14 threshold as defined in the *Directive on Operational Adjustments, Deviations and Extreme Conditions* (<https://ijc.org/en/loslrb/who/directives/deviations>). The Board reached consensus to implement a major deviation strategy under this authority and outflows were set to 100 m<sup>3</sup>/s (3,530 cfs) below the amount prescribed by the Rule Curve beginning on May 29<sup>th</sup>. On June 1<sup>st</sup>, the Board reached consensus to further reduce outflows to 200 m<sup>3</sup>/s (7,060 cfs) below the amount prescribed by the Rule Curve beginning on June 5<sup>th</sup>. This deviation was maintained through July 16<sup>th</sup> when the level of Lake Ontario rose above the applicable low Criterion H14 threshold. On July 17<sup>th</sup>, outflows were set to the applicable Plan 2014 "Rule Curve" flows.

Lake Erie remained above seasonal long-term average levels throughout the six-month reporting period leading to above average inflows into Lake Ontario. The Lake Ontario basin saw monthly precipitation levels well below average from March through June leading to below-average net basin supplies. Above-average precipitation and net basin supplies were then observed in July and August.

The Board met remotely eight times during the reporting period, along with IJC advisors, associated subcommittees, and advisory groups, to conduct business and assess conditions. Notably, on June 15<sup>th</sup>, and June 17<sup>th</sup>, 2021 the Board hosted public virtual meetings to address the concerns of the public on the low water conditions. Additionally, the Board, IJC, and the two other Great Lakes Boards held a joint webinar in English on August 27<sup>th</sup> and in French on September 8<sup>th</sup> to explain and answer questions from the public about the current conditions throughout the Great Lakes Basin and provide information on the limited influence that regulation has on water levels on the Lakes. The Board also continued to operate and maintain its website and Facebook page.

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\*[Appendix C](#), available on the [Reports Library page](#) of the Board's website, provides the background information that had been included in the main body of these reports previously, allowing this report to focus on the issues and conditions of the reporting period.

# 1 Hydrological Conditions

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## 1.1 Lake Ontario Basin - Net Basin Supply

Monthly net basin supplies (NBS) to Lake Ontario (see Appendix C for definition) for March 2021 through August 2021 and the average for the six-month period are provided in Table 1. Abnormally dry to drought conditions within the basin (see snapshots from North American drought monitor on cover) resulted in local NBS that were below average from March through June. However, July and August were much wetter and local NBS exceeded the seasonal long-term average in those months. The cover photo of this report includes Snapshots of the North American drought monitor at various points in the reporting period illustrating the abnormally dry to drought conditions that persisted throughout the Great Lakes – St. Lawrence River and Ottawa River basins.

## 1.2 Supply from Lake Erie

Reflecting the well-above-average water levels in Lake Michigan-Huron and Lake Erie, the inflows to Lake Ontario from Lake Erie during the reporting period were above average from March through August (Table 1). The six-month average Lake Erie outflow during the reporting period was 117 percent of long-term average (1900-2019).

## 1.3 Lake Ontario – Net Total Supply

The monthly net total supplies (NTS) to Lake Ontario (see Appendix C 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 2020 (blue) and the supplies through August for 2021 (black). Also shown, for comparison purposes, are the monthly NTS for 2019 (grey) and 2020 (red). The grey horizontal bars are the long-term monthly NTS maxima and minima. Net total supplies were near or above average throughout the reporting period. Overall, high inflows from Lake Erie were partially offset by below average net basin supplies from the Lake Ontario basin itself, and the six-month average net total supply was 109 percent of the long term average (1900-2020) for the six month reporting period.

## 1.4 Ottawa River Basin

Outflows from the Ottawa River basin were well above average in March and early April as they rose and reached an early spring peak. However, the Ottawa River freshet was relatively short and flows dropped quickly in April to well-below average and near-record lows. The end of June saw flows set record lows briefly before wetter weather moved into the region. In July and early August, flows increased somewhat due to heavier summer precipitation and were slightly above average. Dry weather returned however and flows fell well below average for the rest of August and into fall (Figure 2).

# 2 Regulatory Operations

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## 2.1 Regulation Overview

Figure 3 shows actual daily outflows from Lake Ontario for 2019 (grey), 2020 (red) and 2021 through August (black). Table 2a summarizes the weekly outflows and Table 2b lists all of the flow changes that were made during the reporting period.

Given the drought conditions observed this spring, water levels fell dramatically from those observed last spring. Lake Erie remained well above average throughout the reporting period offsetting to some extent the extreme low levels that could have occurred if inflows from Erie through the Niagara River had not been above average for the entire reporting period.

On March 1<sup>st</sup>, the Board ended winter deviations that had been authorized by the IJC under Condition J of the regulation plan. By the beginning of March, water levels on Lake Ontario had fallen below long-term average and the risk of flooding for the spring of 2021 was greatly reduced from the risk calculated in December of 2020. The Board agreed to maintain the balance of the winter deviations given the uncertainty of the forecast and the timing and magnitude of the spring freshet on the Ottawa River.

The Seaway Corporations opened the commercial navigation season on the St. Lawrence River on March 22<sup>nd</sup>. At this point in time, Plan 2014 was prescribing “Rule Curve” flows well above the maximum L-Limit for safe navigation. The Board set flows on March 20<sup>th</sup> to the maximum L-Limit to allow conditions within the St. Lawrence River to stabilize by the start of navigation season. The rest of the deviations were restored to Lake Ontario by outflow reductions executed from April 10<sup>th</sup> through April 30<sup>th</sup>. By May 1<sup>st</sup>, Lake Ontario levels had returned to Plan levels. In other words, the level of Lake Ontario was at the same level it would have been if no deviations had been implemented in January and February of 2021.

As drought conditions affected the spring rise of Lake Ontario, water levels fell below the applicable low Criterion H14 threshold in late May. From May 29<sup>th</sup> through July 17<sup>th</sup>, the Board reduced outflows below those prescribed by Plan 2014.

## **2.2 Deviations from Regulation Plan 2014**

Figure 4 shows daily outflows through August 2021 (black line) compared to the weekly Plan-specified outflows from Lake Ontario (grey squares) as well as pre-project flows (red circles). All of the outflow changes, including operational adjustments, and 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 in order to maintain the intent of the Board’s outflow strategy and are not required to be paid back by subsequent offsetting outflows. Plan 2014 continued to prescribe high outflows during the reporting period in response to the continuing high levels and inflows from Lake Erie. The Board considered this factor when deciding to employ major deviations in June authorized by the low water Criterion H14 rule of Plan 2014.

In January and February 2021, the Board conducted deviations in accordance with Condition J of the IJC’s Order. Outflows above those prescribed by Plan 2014 were released. These deviations removed a total of 9.4 cm (3.7 in.) from Lake Ontario, relative to strict adherence to Plan 2014. Restoration of these 9.4 cm (3.7 in.) commenced on March 20<sup>th</sup>, 2021. The Board began restoration of this extra water removed over the winter by reducing flows from the Plan-prescribed “Rule Curve” flows to the maximum L-Limit flows defined in Plan 2014. The navigation season began on March 22<sup>nd</sup> and this operation succeeded in providing safe flows for commercial transits and began the restoration of accumulated deviations from the winter deviation strategy. The Board further decreased outflows and accelerated the restoration of the extra removed water beginning on April 10<sup>th</sup> at a rate of 2 cm (0.8 in.) per week through May 1<sup>st</sup>. By May 1<sup>st</sup>, the 9.4 cm (3.7 in.) was fully restored and the level of Lake Ontario was at the same level it would have been if no deviations had been implemented in January and February of 2021.

As the drought conditions persisted and precipitation and local runoff remained much lower than average, water levels on Lake Ontario rose much less than usual in the spring and fell below the applicable low Criterion H14 threshold in late May. When water levels fall below this threshold, the Board is granted the authority to deviate from Plan-prescribed flows. As defined in the Directive (<https://ijc.org/en/loslr/who/directives/deviations>), deviations from plan-prescribed “Rule Curve” flows under the low Criterion H14 threshold are meant to “provide all possible relief to municipal water intakes, navigation and power purposes, upstream and downstream.” The Board leveraged this authority on May 29<sup>th</sup>, setting outflows from Lake Ontario 100 m<sup>3</sup>/s (3,530 cfs) below the amount prescribed by the “Rule Curve” of the regulation plan. Outflows were further decreased on June 5<sup>th</sup> to 7,620 m<sup>3</sup>/s (269,100 cfs),

which was 200 m<sup>3</sup>/s (7,060 cfs) below the amount prescribed by the “Rule Curve” of the regulation plan. Outflows continued to be set 200 m<sup>3</sup>/s (7,060 cfs) below the amount prescribed by the “Rule Curve” while the lake level remained below the applicable low Criterion H14 threshold. Due to a wet July, water levels rose above the applicable low Criterion H14 threshold in mid-July; the Board ended deviations and returned to plan-prescribed “Rule Curve” flows on July 17<sup>th</sup>.

The result of the major deviation flow reductions was to store an extra 4 cm (1.6 in.) of water on Lake Ontario, relative to strict adherence to Plan 2014. Given that there was still a lot of uncertainty on fall precipitation accumulations and other conditions, the Board reached a consensus decision to retain this extra water through the end of the reporting period. A decision on what to do with this stored water will be made this Fall after conditions are more evident.

During the reporting period, one minor deviation was also implemented. On April 15<sup>th</sup>, the Board agreed to allow a minor deviation to assist a vessel arriving to Montreal. Flows were marginally increased for a short period of time to ensure enough draft for the vessel to access the Port of Montreal.

### **2.3 Water Levels throughout the system**

Figure 5 shows the daily levels of Lake Ontario for 2019 (grey), 2020 (red) and 2021 through August (black). Lake Ontario’s water level remained below average (but above record lows) for the majority of the reporting period due to the drought conditions and despite the continuing high inflows from Lake Erie. Due to a very wet July and a wetter than average August, water levels rose and returned to seasonal long-term average levels by the end of August.

As a means of determining the effect of regulation activities on levels and outflows, a comparison of Lake Ontario’s actual monthly levels and outflows to those that would have occurred under pre-project conditions (i.e., the levels and outflows that would have occurred had regulation not been undertaken) is provided in Table 3. This summary shows that Lake Ontario was approximately 70 to 97 cm (2.3 to 3.2 ft) lower than it would have been without regulation throughout the reporting period. Comparisons of the observed daily mean levels (black line) to long-term average (blue dashed line), pre-project levels (red circles), and computed Plan 2014 levels (grey squares) during the reporting period are also shown in Figure 6.

The water levels of Lake St. Lawrence at Long Sault Dam (Figure 7) were well-below average owing to the higher than average outflows prescribed by Plan 2014. As shown in Figures 3 and 4, outflows from Lake Ontario remained above average throughout the reporting period in response to the high Lake Erie inflows. New record minimum monthly mean levels were observed in April and May. Lake St. Lawrence levels rose during periods of reduced outflows (e.g. during the Ottawa River freshet in late March), but then fell again to well-below-average levels through the summer.

Daily water levels at Summerstown on Lake St. Francis fluctuated but remained near long-term seasonal average values throughout the reporting period.

The daily water levels on Lake St. Louis at Pointe-Claire (Figure 8) rose during the late-March Ottawa River freshet but then quickly declined to well-below-average levels in response to the abnormally dry conditions. The higher-than-average precipitation in July caused levels to rise and levels fluctuated near the long-term seasonal average through the end of August.

The daily levels at the Port of Montreal (Figure 9) and at Sorel on Lake St. Peter (Figure 10) also started the reporting period at above-average levels in March and early April, and then fell to well below average levels. The higher-than-average precipitation in July caused levels to rise. Levels then declined again through August.



## **2.4 Iroquois Dam Operations**

All gates at Iroquois Dam remained open and raised above the water line throughout the reporting period. As usual, the two navigational gates were raised higher than the other gates to allow additional space to allow recreational boats to pass underneath. 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/loslr/library/modules>

## **2.5 Long Sault Dam Operations**

A varying number of gates were opened at Long Sault Dam, at different times throughout the reporting period, to manage the Lake Ontario outflow in concert with plant operations of the Moses-Saunders Dam. Long Sault Dam spillage was primarily due to transmission system congestion and economic conditions caused by hydropower curtailment from new renewable energy sources (i.e. solar and wind), in addition to several maintenance outages at the Moses-Saunders Dam. Long Sault Dam operated intermittently 71 of the 184 days of the reporting period (39 percent of the time). The amount of water spilled (lost to electrical power generation) reached a maximum daily mean value of 1,500 m<sup>3</sup>/s on May 11<sup>th</sup>.

## **2.6 Raisin River Diversion**

The Raisin River Diversion was opened from June 3<sup>rd</sup> through August 27<sup>th</sup>. However, the diverted flows recorded 0.1 m<sup>3</sup>/s (4 cfs) on only three days of the reporting period, with the remaining 83 days recording no diverted flow.

## **2.7 St. Lawrence Seaway Report**

The 2021 navigation season opened on the Montreal-Lake Ontario section of the Seaway with the first ship of the season, the MV *Baie St. Paul*, transiting the system on March 22<sup>nd</sup>.

## **2.8 Hydropower Peaking and Ponding**

By letter dated October 13, 1983, the IJC authorized Ontario Power Generation (OPG) and New York Power Authority (NYPA) to continue to carry out peaking and ponding operations at the St. Lawrence Project. The conditions governing peaking and ponding operations are currently specified in Addendum No. 3 to the Operational Guides for Regulation Plan 1958-D. On November 4, 2016, the IJC renewed the approval for a 5-year period, from December 1st, 2016 to November 30th, 2021.

Peaking operations were conducted under this authority from March 23<sup>rd</sup> through April 2<sup>nd</sup>, April 10<sup>th</sup> through April 18<sup>th</sup>, April 24<sup>th</sup> through April 26<sup>th</sup>, and June 5<sup>th</sup> through July 16<sup>th</sup>. Otherwise, peaking operations were not conducted because outflows were above the 7930 m<sup>3</sup>/s threshold.

# **3 Board Activities**

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The Board continued 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, monitored conditions throughout the Lake Ontario-St. Lawrence River system. The Board held their regular semi-annual meeting in March via virtual platform and, due to the drought-induced low water levels, the Board also met seven additional times by teleconference to address their responsibilities for setting the outflow of Lake Ontario. Throughout the reporting period, the Board was in constant communication with the IJC.

The regulation representatives provided the Board with frequent water level and hydrologic conditions updates and advised the Board on the impacts that potential regulation 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) continued to hold weekly teleconferences to review conditions and advise the regulation representatives on weekly operational requirements and constraints. The OAG also answered queries on



regulation strategies from the Board.

The Board continued to work with the IJC, through the Communications Committee, to seek opportunities to improve communications, outreach, and engagement with its stakeholders and the public. Despite the continuation of the pandemic virus, COVID-19, the Board was able to conduct all its business as usual through virtual methods. No interruptions of Board business or the ability to comply with the Board's agreed-upon regulation strategy occurred due to the pandemic.

### **3.1 Board Meetings & Conference Calls**

The Board met remotely eight times during the reporting period (March 24<sup>th</sup>, April 7<sup>th</sup>, April 20<sup>th</sup>, May 5<sup>th</sup>, June 1<sup>st</sup>, June 17<sup>th</sup>, July 15<sup>th</sup>, and August 27<sup>th</sup>), along with IJC advisors, associated subcommittees, and advisory groups, to conduct business and assess conditions. Table 4 provides a list of Board Members in attendance at these meetings.

### **3.2 Board and Committee Membership Changes**

The term of IJC appointed Canadian Co-chair, Genevieve Bechard, expired on April 30<sup>th</sup>, 2021. Her service to the Board during the very difficult conditions over her three-year tenure was exemplary and vastly appreciated. The IJC appointed Mr. David Harper as her replacement on June 14<sup>th</sup>, 2021. Mr. Harper is the Director General of the Monitoring and Data Services Directorate of Meteorological Services of Canada with Environment and Climate Change Canada. Mr. Harper has been appointed to a three-year term expiring on June 14<sup>th</sup>, 2024.

### **3.3 Communications, Outreach and Engagement**

Since March 1<sup>st</sup>, 2021, the Communications Committee held six meetings via teleconference. A smaller subsection of the committee met weekly to discuss pressing communications issues. During the reporting period, the Communications Committee, individual Board members, the secretaries and the regulation representatives were actively engaged in outreach, information exchange and liaison with stakeholders throughout the Lake Ontario-St. Lawrence River system and participated in various stakeholder and public meetings. Notably, on August 27<sup>th</sup>, 2021, the IJC, the Board, the International Lake Superior Board of Control, and the International Niagara Board of Control held a joint webinar (<https://vimeo.com/595224757>) to explain and answer questions from the public about water level conditions in the entire Great Lakes–St. Lawrence River system. A French webinar was held on September 8<sup>th</sup> to provide the same opportunity for engagement with the Canadian French speaking community (<https://vimeo.com/601098755>). Additional outreach efforts are listed in Appendix A.

A total of eight media releases were published, distributed and posted on the Board's website. Board members and staff responded to a number of telephone and email inquiries from local government officials, interested stakeholders, and members of the general public concerning water level conditions and Board strategies and conducted numerous interviews with the media. Board staff continued to send weekly updates on current conditions to over 500 email subscribers. Regular updates on the Board's Facebook pages continue to be posted in both French and English and Board staff responded to public comments and questions.

The Canadian regulation representative office continued to provide weekly 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.

The Board continued to operate and maintain its website (<https://www.ijc.org/en/loslrb>). The Board also developed and posted two issues of its quarterly newsletter (<https://ijc.org/en/loslrb/newsletters>) to inform readers of current and seasonal conditions in the spring and summer.

### **3.4 Gauging Committee**

The St. Lawrence Committee on River Gauging (Gauging Committee) is granted authority by the Board to 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 eight 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.

Due to the nature of the Gauging Committee's work, there have been significant interruptions due to the global COVID-19 pandemic. Border crossing restrictions, local safety requirements for safe distancing and masking, and access to vaccines has delayed the normal work schedule of the Committee. Therefore, there was no field work done by the gauging committee in this reporting period. However, field surveys and all of the 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.

A precision survey is planned for 2022. It was deferred owing to the COVID-19 pandemic and associated travel restrictions. NOAA's National Geodetic Survey (NGS) office will follow the same survey route as the previous precision survey, using newer, stricter procedures related to the new horizontal and vertical datum, Geoid 2022. This datum will be the base relationship for the new International Great Lakes Datum (IGLD 2020), with emphasis on GPS observations.

## **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 regulation plans. During this reporting period, the GLAM Committee continued to work with the Boards to implement the science-based recommendations of past studies and develop new ones. The Committee ultimately seeks to evaluate regulation plan performance over time with regard to a broad range of environmental and economic indicators.

During the reporting period, the GLAM Committee was focused on planning and executing tasks in support of Phase 1 of the expedited review of Plan 2014. The Phase 1 effort was designed to provide information to support the Board in its regulation decisions during extreme events, and more specifically, the Board's objective of implementing deviations under Criterion H14 major deviation authority (or deviation authority granted under Condition J) when applicable.

Additionally, the GLAM Committee has been working to complete its report on Phase 1 activities. The draft report has been reviewed by the Board and is currently undergoing updates and revisions. The final Phase 1 report is expected to be available to the public in early 2022. The GLAM Committee will soon be initiating Phase 2 of the expedited review of Plan 2014. The second phase look at how Plan 2014 addresses extreme high and low water levels over the longer term. The GLAM Committee will advise the Board on whether adjustments to the plan might make sense. Any 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](#).

Due to COVID-19 travel restrictions currently in place, the entire Board was unable to sign the report with the current technologies available to them. Instead of individual signatures, the Board provided consensus approval of the final draft of this report via email concurrence. These concurrences have been provided to the IJC to verify Board approval of all contents of this report.

**Table 1: Provisional Monthly Mean Supplies to Lake Ontario**

Month (2021)	Inflow from Lake Erie				Local Net Basin Supplies			Total Supplies			
	m <sup>3</sup> /s	tcfs	Exceed. Prob. <sup>(1)</sup>	% of LTA <sub>(1)</sub>	m <sup>3</sup> /s	tcfs	Exceed. Prob. <sup>(1)</sup>	m <sup>3</sup> /s	tcfs	Exceed. Prob. <sup>(1)</sup>	% of LTA <sub>(1)</sub>
March	7040	249	7	122	1280	45	85	8320	294	32	107
April	7170	253	9	118	1260	44	95	8430	298	57	97
May	7110	251	15	112	1070	38	80	8180	289	42	102
June	7040	249	16	111	780	28	78	7820	276	35	104
July	7380	261	5	118	1420	50	5	8800	311	2	127
August	7310	258	4	119	430	15	23	7740	273	3	122
6-month Average	7180	254	8	117	1040	37	84	8220	290	22	109

(1) Based on period of record 1900-2020

**Table 2a: SUMMARY OF WEEKLY OUTFLOWS, OPERATIONAL ADJUSTMENTS AND DEVIATIONS**

Week Ending 2021	Adjusted Rule Curve Flow		Plan Flow		App. Rule/ Limit	Actual Flow		Operational Adjustments &/or Plan Limitations		Deviations								Type	Details
	m³/s	tcfs	m³/s	tcfs		m³/s	tcfs	m³/s	tcfs	m³/s	tcfs	m³/s- wks	tcfs- wks	cm	in.				
5-Mar	8140	287	8140	287	RC	8270	292	130	5	130	5	3030	107	-9.4	-3.7	Major	Major deviations under Condition J (ice management & maintain Plan 2014 winter I-limit threshold at Lake St. Lawrence of 71.8 m); Return to Plan 2014 Rule Curve flow on March 1 (in accordance with Board's February 19 decision)		
12-Mar	8080	285	8080	285	RC	8080	285	0	0	0	0	3030	107	-9.4	-3.7	--	Plan (Rule Curve)		
19-Mar	8000	283	8000	283	RC	8000	283	0	0	0	0	3030	107	-9.4	-3.7	--			
26-Mar	7990	282	7990	282	RC	7380	261	-610	-21	-610	-21	2420	86	-7.5	-3.0	Major		Outflow set to max. L Limit based on actual EOW level (Seaway navigation season open as of March 22)	
2-Apr	7880	278	7880	278	RC	7380	261	-500	-17	-500	-17	1920	68	-5.9	-2.3	Major			
9-Apr	8070	285	8070	285	RC	7980	282	-90	-3	-90	-3	1830	65	-5.7	-2.2	Major			
16-Apr	8020	283	8020	283	RC	7480	264	-540	-19	-540	-19	1290	46	-4.0	-1.6	Major & Minor	Major deviation restoration; Minor deviation to assist vessel arriving to Montreal; Minor & Major deviation restoration resumes		
23-Apr	8010	283	8010	283	RC	7350	260	-660	-23	-660	-23	630	22	-2.0	-0.8	Major & Minor	Minor & Major deviation restoration continues		
30-Apr	8040	284	8040	284	RC	7420	262	-620	-22	-620	-22	10	0.4	0.0	0.0	Major	Major deviation restoration		
7-May	7920	280	7920	280	RC	7920	280	0	0	0	0	10	0.4	0.0	0.0	--	Major deviation restoration continues		
14-May	8070	285	8070	285	RC	8070	285	0	0	0	0	10	0.4	0.0	0.0	--			
21-May	8090	286	8090	286	RC	8080	285	-10	-1	-10	-0.4	0	0	0.0	0.0	Major			
28-May	7970	281	7970	281	RC	7970	281	0	0	0	0	--	--	--	--	--	Plan (Rule Curve)		
4-Jun	7940	280	7940	280	RC	7840	277	-100	-3	-100	-3	-100	-3	0.3	0.1	Major	Major (criterion H14 low threshold) deviations (100 m³/s below Rule Curve)		
11-Jun	7820	276	7820	276	RC	7620	269	-200	-7	-200	-7	-300	-11	0.9	0.4	Major	Major (criterion H14 low threshold) deviations (200 m³/s below Rule Curve)		
18-Jun	7800	275	7800	275	RC	7600	268	-200	-7	-200	-7	-500	-18	1.5	0.6	Major			
25-Jun	7760	274	7760	274	RC	7560	267	-200	-7	-200	-7	-700	-25	2.2	0.9	Major			
2-Jul	7750	274	7750	274	RC	7550	267	-200	-7	-200	-7	-900	-32	2.8	1.1	Major			
9-Jul	7800	275	7800	275	RC	7600	268	-200	-7	-200	-7	-1100	-39	3.4	1.3	Major			
16-Jul	7820	276	7820	276	RC	7620	269	-200	-7	-200	-7	-1300	-46	4.0	1.6	Major			
23-Jul	7960	281	7960	281	RC	7960	281	0	0	0	0	-1300	-46	4.0	1.6	--	Plan (Rule Curve)		
30-Jul	8140	287	8140	287	RC	8140	287	0	0	0	0	-1300	-46	4.0	1.6	--			
6-Aug	8100	286	8100	286	RC	8100	286	0	0	0	0	-1300	-46	4.0	1.6	--			

Week Ending 2021	Adjusted Rule Curve Flow		Plan Flow		App. Rule/ Limit	Actual Flow		Operational Adjustments &/or Plan Limitations		Deviations							Type	Details
										Weekly		Accumulated		Cumulative effect on L. Ontario				
	m³/s	tcfs	m³/s	tcfs		m³/s	tcfs			m³/s	tcfs	m³/s- wks	tcfs- wks	cm	in.			
13-Aug	8030	284	8030	284	RC	8030	284	0	0	0	0	-1300	-46	4.0	1.6	--		
20-Aug	8030	284	8030	284	RC	8030	284	0	0	0	0	-1300	-46	4.0	1.6	--		
27-Aug	8000	283	8000	283	RC	8000	283	0	0	0	0	-1300	-46	4.0	1.6	--		
3-Sep	8020	283	8020	283	RC	8020	283	0	0	0	0	-1300	-46	4.0	1.6	--		

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

**Table 2b: SUMMARY OF FLOW CHANGES**

Week Ending 2021	Flow Changes								Details
	Day	Hr	(m³/s)		(tcfs)		Reason	App. Rule/ Limit	
			From	To	From	To			
05-Mar	1-Mar	0001	8600	8140	303.7	287.5	Plan	RC	Return to Plan 2014 Rule Curve flow (in accordance with Board's February 19th decision)
12-Mar	6-Mar	0001	8140	8080	287.5	285.3	Plan	RC	Plan (Rule Curve)
19-Mar	13-Mar	0001	8080	8000	285.3	282.5	Plan	RC	
26-Mar	20-Mar	0001	8000	7380	282.5	260.6	Dev	Major	Outflow set to max. L Limit based on actual EOW level (Seaway navigation season open as of March 22nd)
2-Apr	--	--	--	--	--	--	Dev	Major	
9-Apr	3-Apr	0001	7380	7980	260.6	281.8	Dev	Major	
16-Apr	10-Apr	0001	7980	7420	281.8	262.0	Dev	Major	Restore major (Condition J) deviations
	15-Apr	2101	7420	7820	262.0	276.2	Dev	Minor	Minor deviation to assist vessel arriving to Montreal
	16-Apr	2101	7820	7350	276.2	259.6	Dev	Minor & Major	Restore minor deviation and major (Condition J) deviations
23-Apr	--	--	--	--	--	--	Dev	Minor & Major	
30-Apr	24-Apr	0001	7350	7410	259.6	261.7	Dev	Major	Restore major (Condition J) deviations
7-May	1-May	0001	7410	7920	261.7	279.7	Plan	RC	Plan (Rule Curve)
14-May	8-May	0001	7920	8070	279.7	285.0	Plan	RC	
21-May	15-May	0001	8070	8090	285.0	285.7	Plan	RC	
	21-May	0001	8090	8040	285.7	283.9	Dev	Major	Restore remaining major (condition J) deviations
28-May	22-May	0001	8040	7970	283.9	281.5	Plan	RC	Plan (Rule Curve)
4-Jun	29-May	0001	7970	7840	281.5	276.9	Dev	Major	Major (criterion H14 low threshold) deviations (100 m³/s below Rule Curve)
11-Jun	5-Jun	0001	7840	7620	276.9	269.1	Dev	Major	Major (criterion H14 low threshold) deviations (200 m³/s below Rule Curve)
18-Jun	12-Jun	0001	7620	7600	269.1	268.4	Dev	Major	
25-Jun	19-Jun	0001	7600	7560	268.4	267.0	Dev	Major	
2-Jul	26-Jun	0001	7560	7550	267.0	266.6	Dev	Major	
9-Jul	3-Jul	0001	7550	7600	266.6	268.4	Dev	Major	
16-Jul	10-Jul	0001	7600	7620	268.4	269.1	Dev	Major	
23-Jul	17-Jul	0001	7620	7960	269.1	281.1	Plan	RC	Plan (Rule Curve)
30-Jul	24-Jul	0001	7960	8140	281.1	287.5	Plan	RC	
6-Aug	31-Jul	0001	8140	8100	287.5	286.0	Plan	RC	
13-Aug	7-Aug	0001	8100	8030	286.0	283.6	Plan	RC	
20-Aug	--	--	--	--	--	--	Plan	RC	
27-Aug	21-Aug	0001	8030	8000	283.6	282.5	Plan	RC	
3-Sep	28-Aug	0001	8000	8020	282.5	283.2	Plan	RC	

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

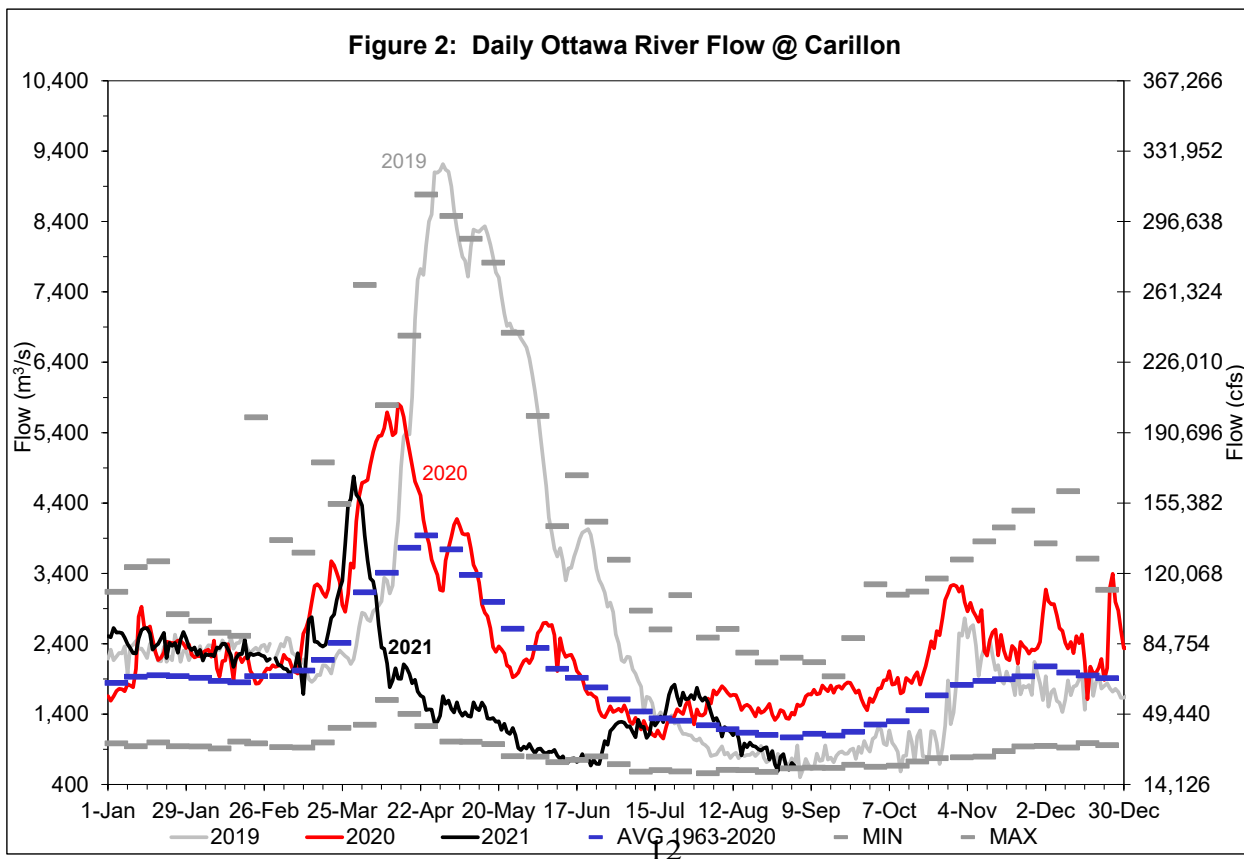
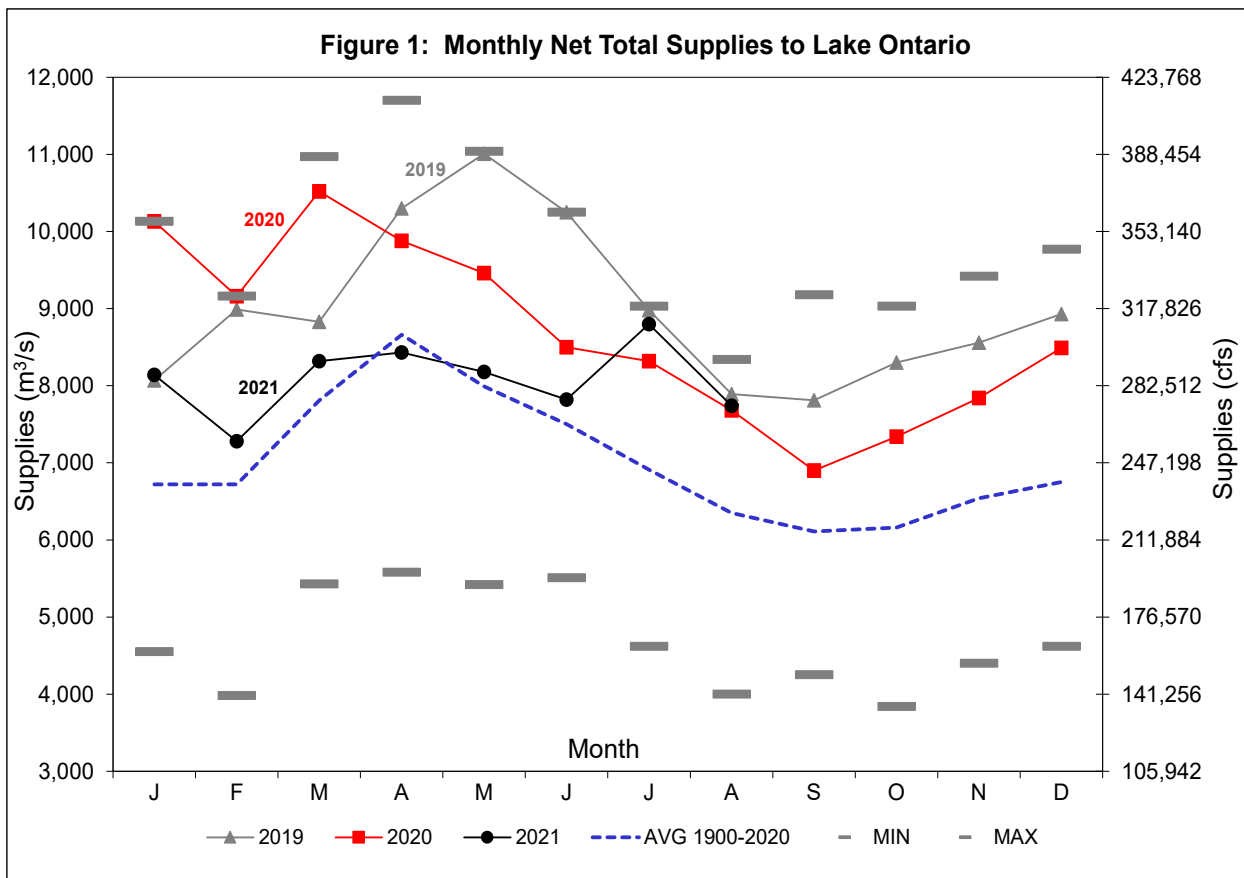
Month (2021)	Lake Ontario Monthly Mean Water Levels (IGLD 1985) - meters (feet)			Lake Ontario Monthly Mean Outflow m <sup>3</sup> /s (tcfs)		
	Recorded	Preproject	Diff.	Recorded	Preproject	Diff.
March	74.49 (244.39)	75.46 (247.57)	-0.97 (-3.18)	7,800 (275)	7,880 (278)	-80 (-3)
April	74.62 (244.81)	75.52 (247.77)	-0.90 (-2.96)	7,540 (266)	8,150 (288)	-610 (-22)
May	74.72 (245.14)	75.56 (247.90)	-0.84 (-2.76)	7,990 (282)	8,230 (291)	-240 (-9)
June	74.71 (245.11)	75.51 (247.73)	-0.80 (-2.62)	7,620 (269)	8,110 (286)	-490 (-17)
July	74.81 (245.44)	75.54 (247.83)	-0.73 (-2.39)	7,820 (276)	8,180 (289)	-360 (-13)
August	74.85 (245.57)	75.55 (247.86)	-0.70 (-2.29)	8,040 (284)	8,190 (289)	-150 (-5)

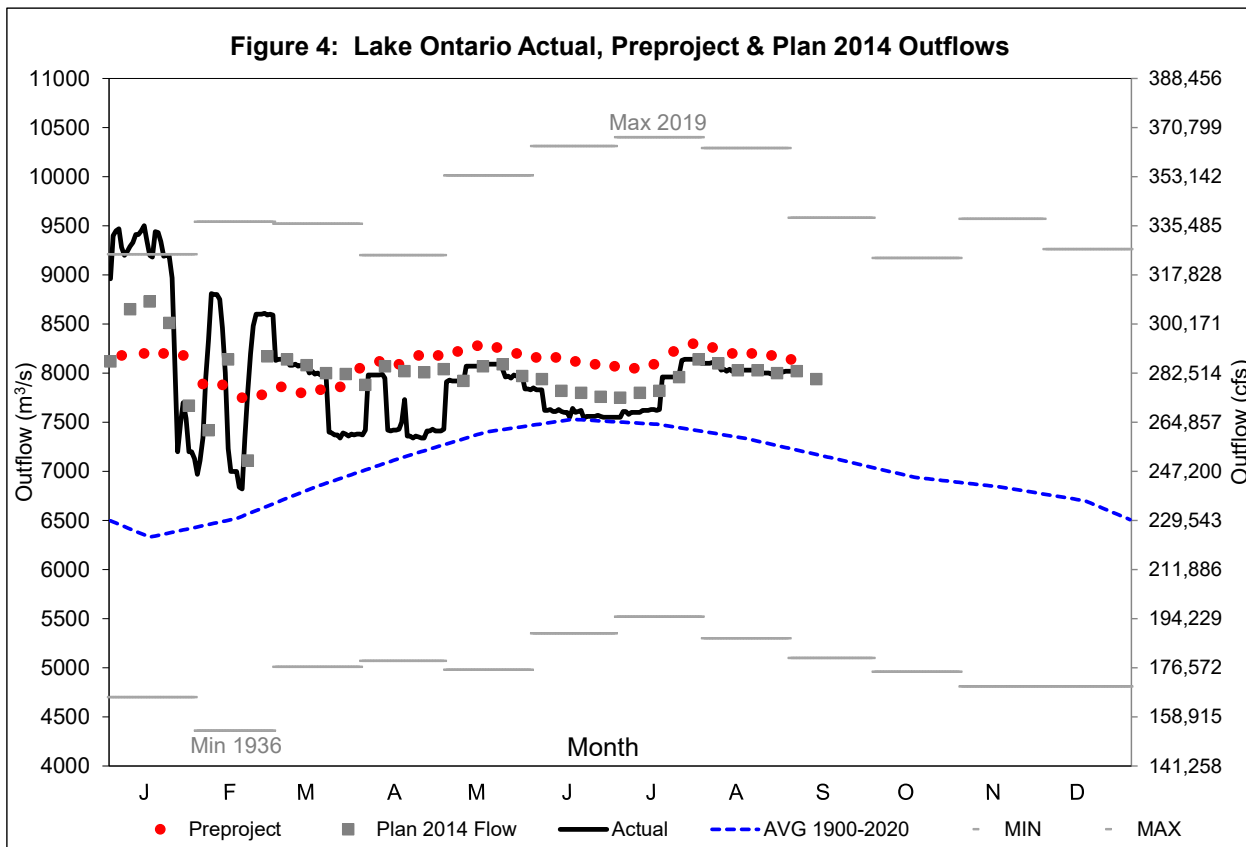
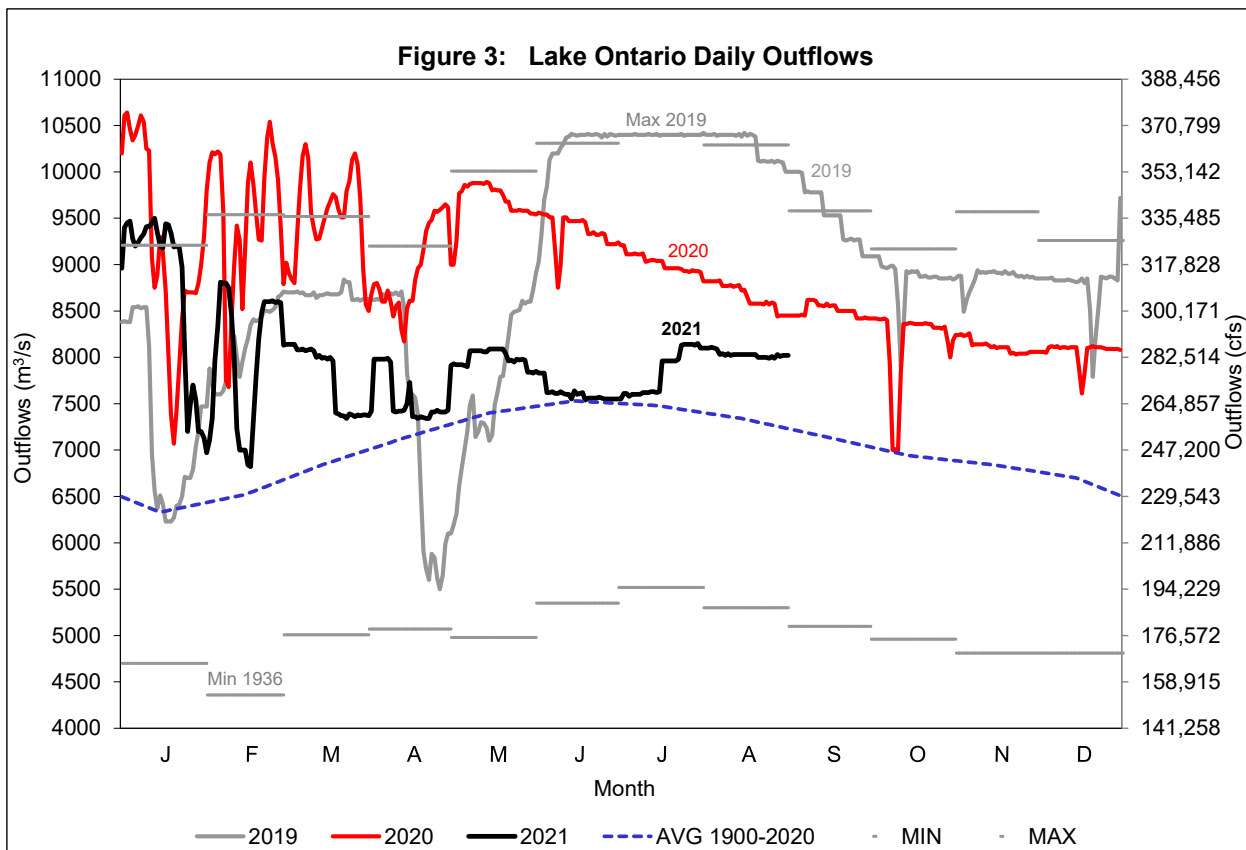
**Table 4: Attendance at Virtual Meetings**

Board Member	Mar 24th	Apr 7th	Apr 20th	May 5th	Jun 1st	Jun 17th	Jul 15th	Aug 27th
Mr. S. Durrett	X	X	X			X	X	
Mr. K. McCune				X	X			X
Dr. G. Béchar	X	X	X					
Mr. D. Harper								X
Mr. T. Brown	X	X	X	X	X	X	X	X
Ms. P. Clavet	X	X	X	X	X	X	X	X
Mr. A. David	X	X	X	X	X	X		
Ms. J. Frain	X	X	X	X	X	X	X	

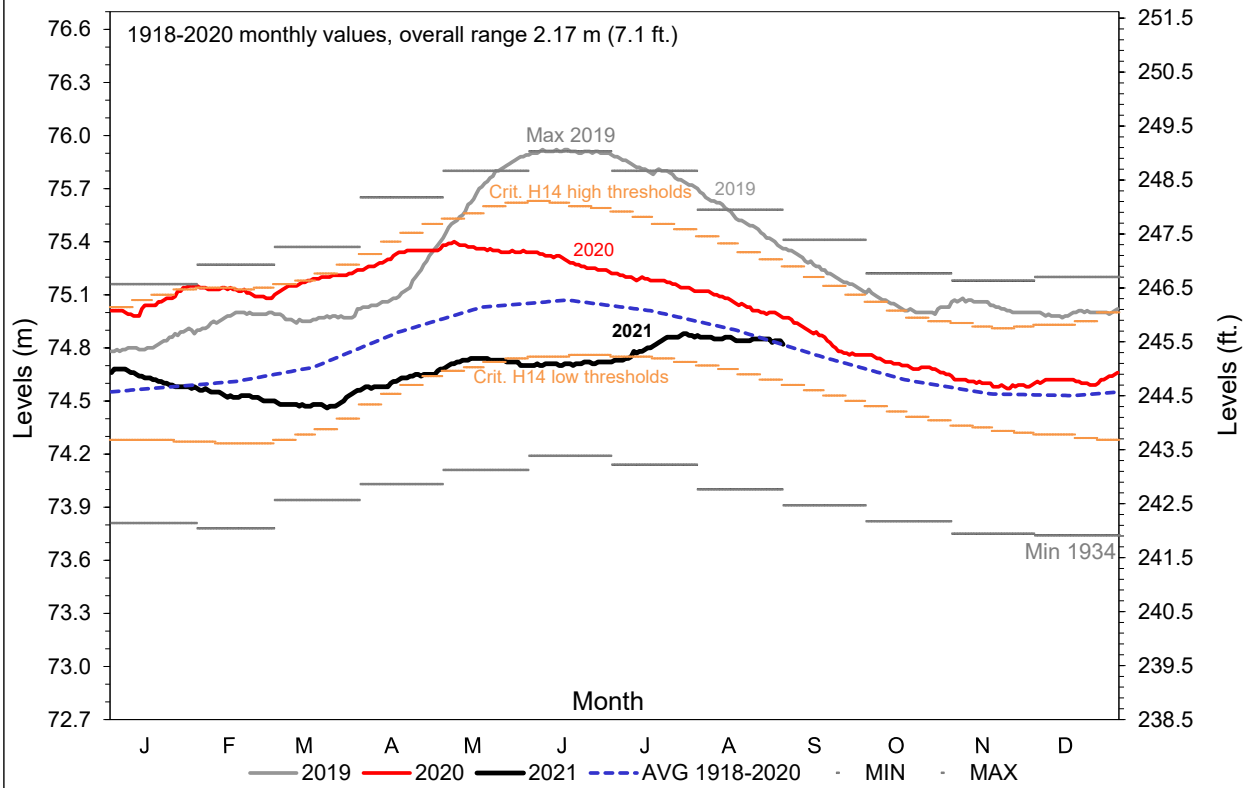
**Date of Spring Semi-Annual Meeting:**March 24<sup>th</sup>, 2021 via virtual video conference



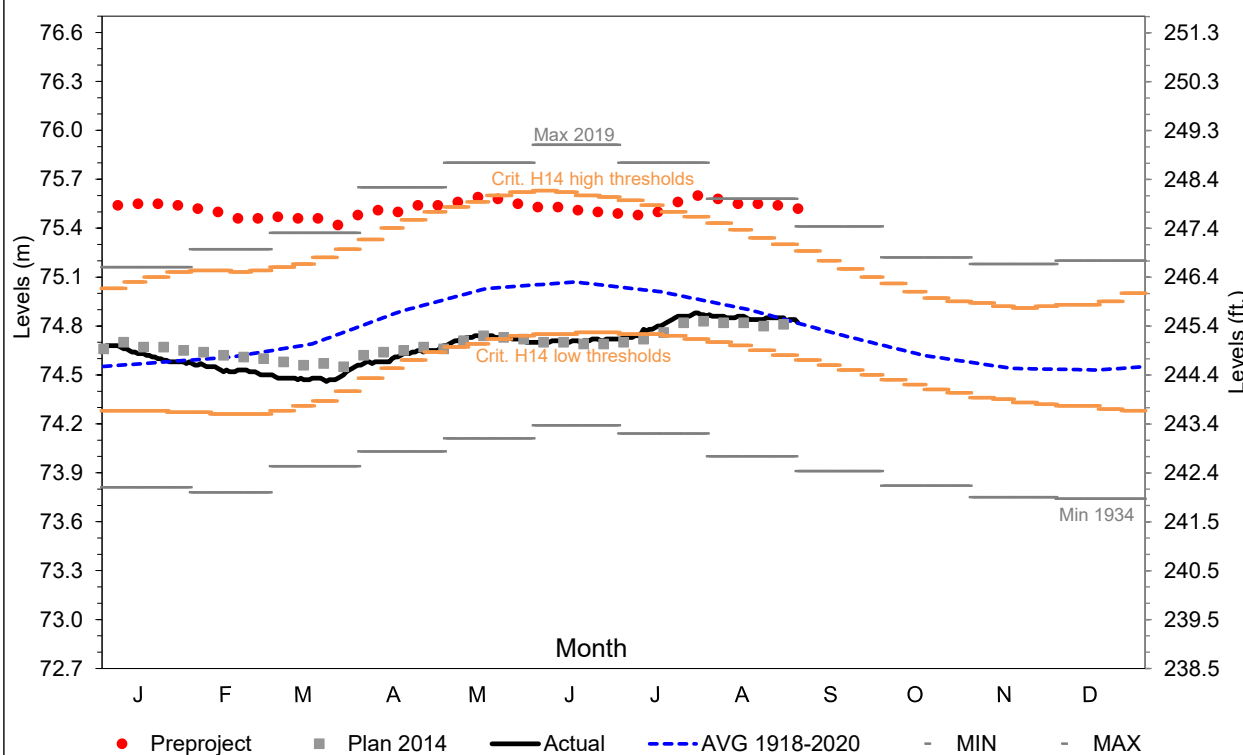




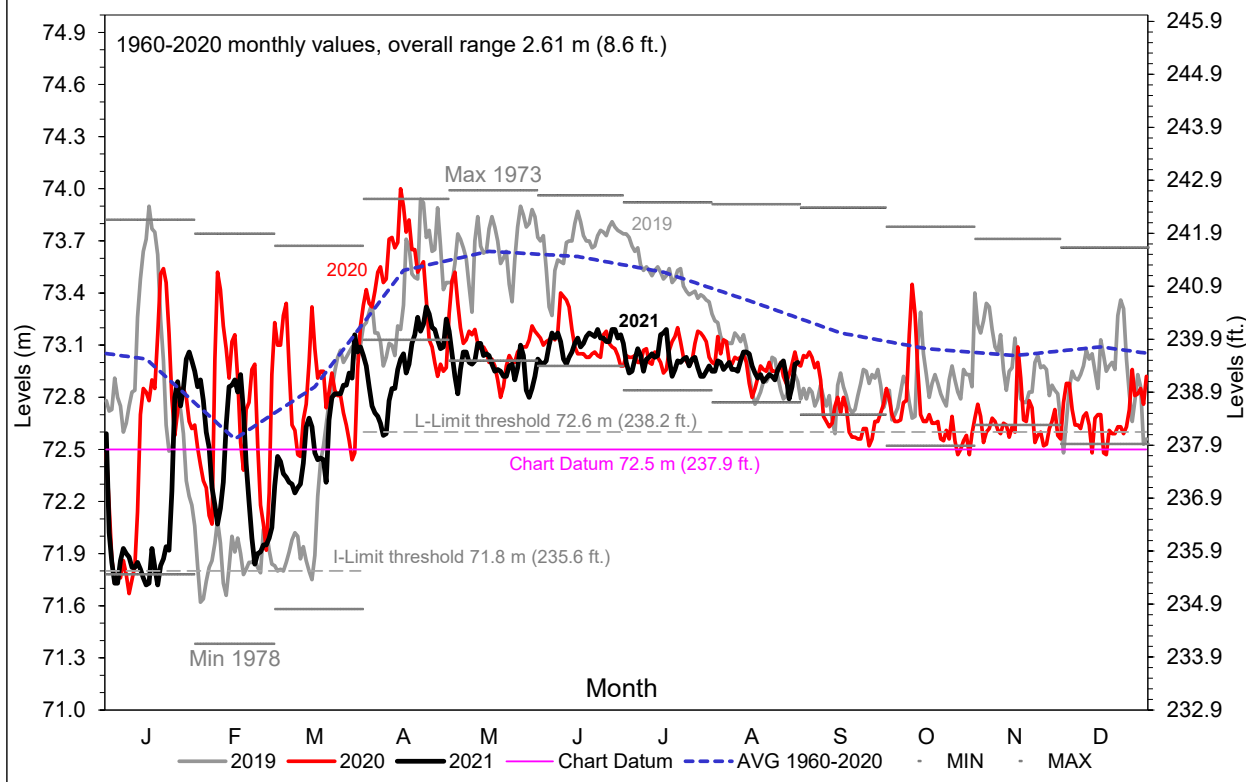
**Figure 5: Daily Lake Ontario Water Levels**



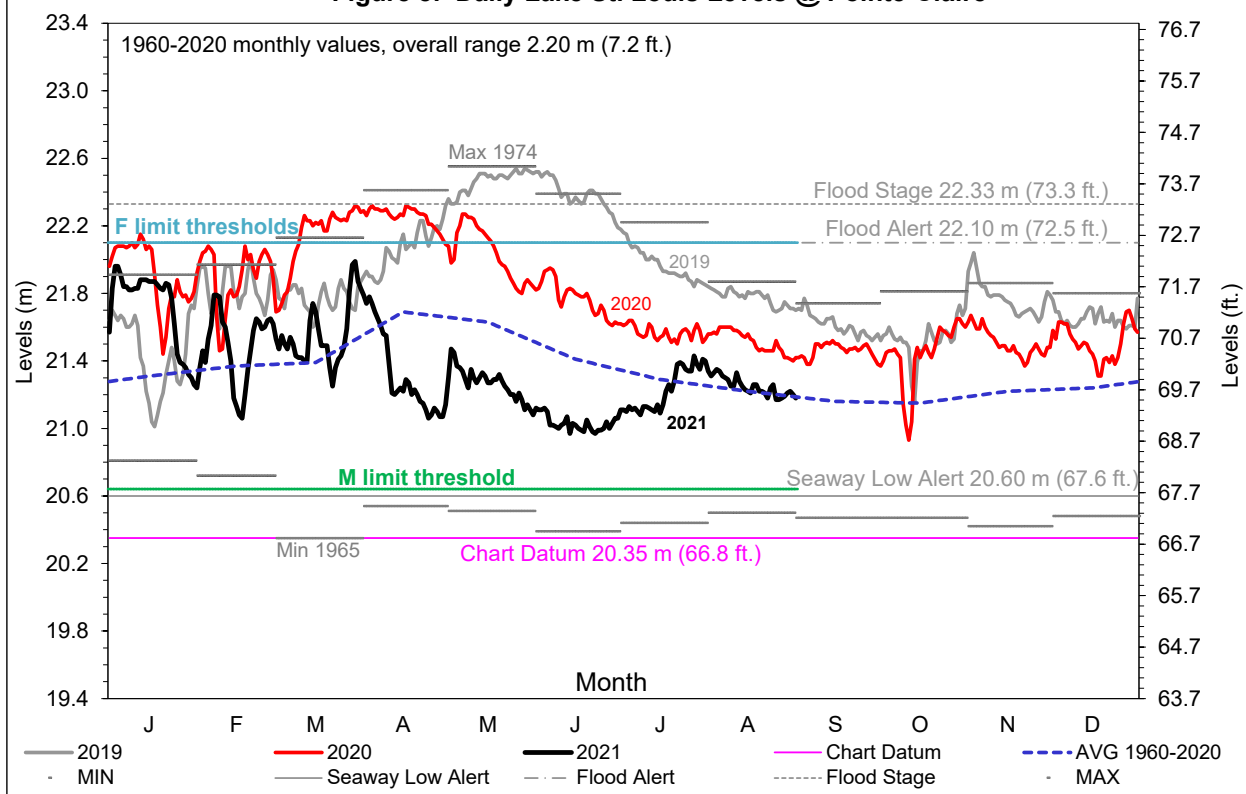
**Figure 6: Lake Ontario Actual, Preproject & Plan 2014 Levels**



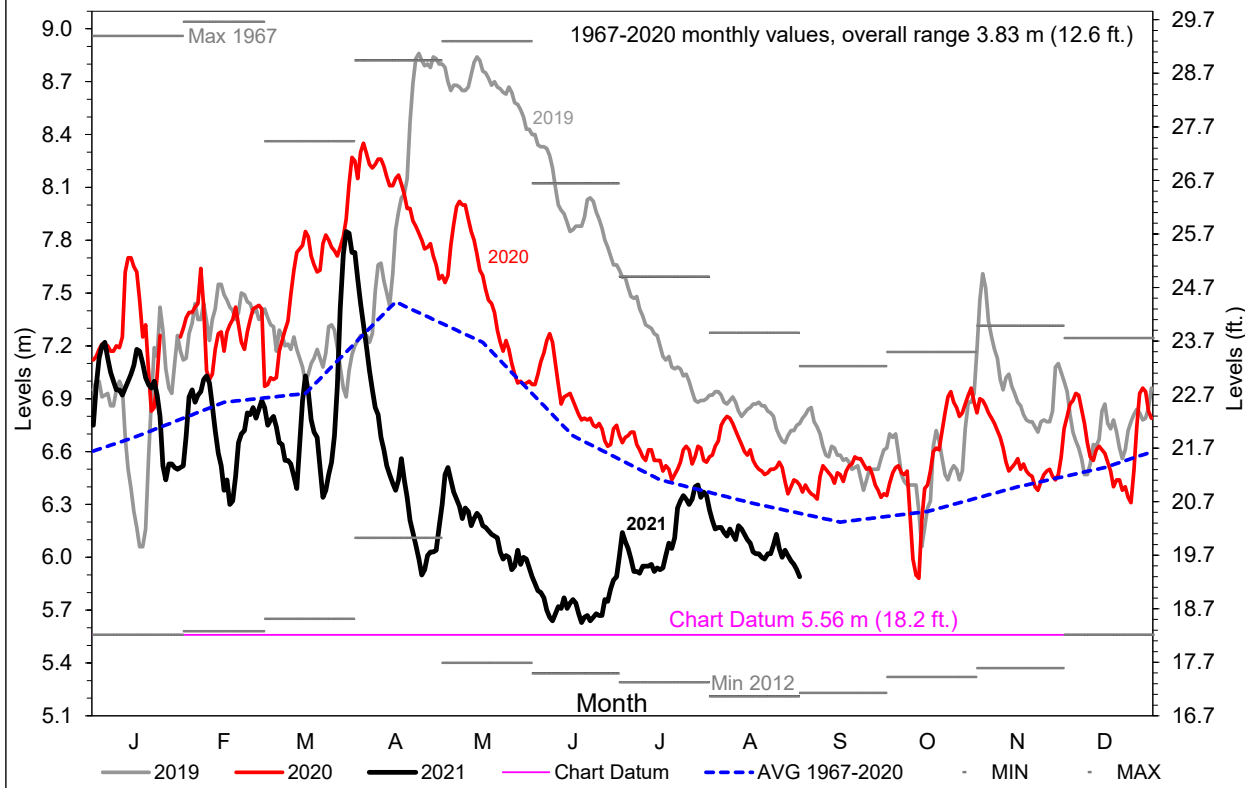
**Figure 7: Daily Lake St. Lawrence Levels @ Long Sault Dam**



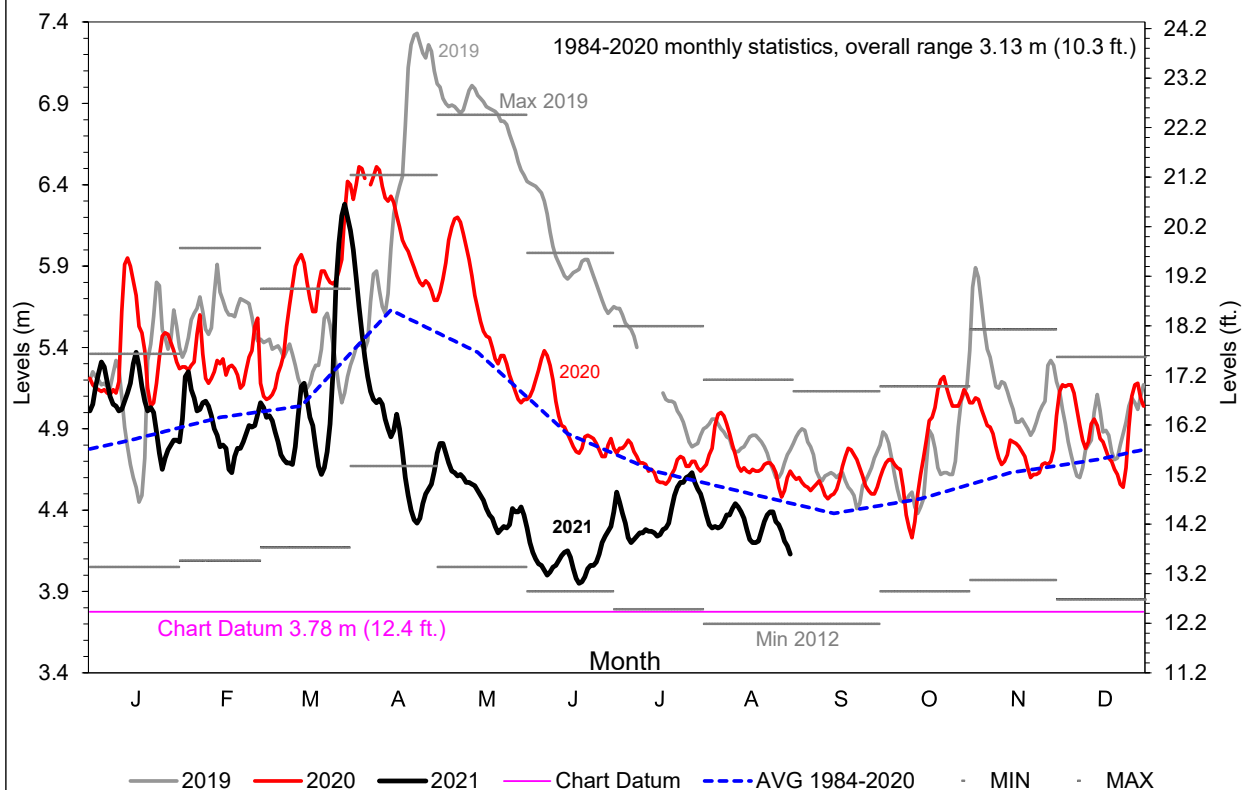
**Figure 8: Daily Lake St. Louis Levels @ Pointe-Claire**



**Figure 9: Daily Port of Montreal Levels @ Jetty #1**



**Figure 10: Daily Lake St. Peter Levels @ Sorel**



## Appendix A: Additional Outreach Activities

The Committee continued to engage in initiatives and develop products to accomplish five strategic communication goals:

- increase general public awareness of the IJC and the Board;
- communicate accurately and in a timely fashion the actions of the Board and the reason for those actions;
- explain how natural factors and regulation affect water levels and flows;
- increase understanding of the necessity of and need to prepare for fluctuations in levels and flows; and
- consistently seek out, consider and respond to the views and concerns of all stakeholders.

Board Members, Secretaries and Regulation Representatives provided a number of interviews with a wide variety of news agencies in the US and Canada throughout the reporting period. Interviews were provided to print, radio and TV agencies, and generally focused on what regulatory strategies the Board was implementing and the conditions observed throughout the system. Some of the agencies that conducted interviews with Board Associates were: Spectrum News, North County Public Radio, WHAM TV in Rochester, the Palladium Times, and the Lockport Journal, the Brockville Recorder & Times, the Cornwall Standard-Freeholder, the Globe and Mail and the Montreal Gazette.

In addition to all the media engagement, Board members and representatives were very busy with personal engagement. Hundreds of email replies were sent to concerned individuals through the IJC and Board website contact forms. These responses were crafted with the intent to dispel misinformation about the effects of regulation on the system and provide explanations for the various flow changes throughout the reporting period.

Board members and representatives also actively engaged stakeholders by presenting at or attending the following venues where they answered questions and concerns from those present:

April 28	Town Hall event on Lake St. Lawrence, Louisville, New York
May 18	International Association for Great Lakes Research - IAGLR (virtual)
June 15	Board hosted Public Webinar on cause of Low water conditions – English with French translation (virtual)
June 17	Board hosted Public Webinar on cause of Low water conditions – English with French translation (virtual)
August 9	Save The River Panel Discussion “The Ups and Downs of Great Lakes Water Levels”, Clayton, NY
August 27	Great Lakes Tri-Board Public webinar – English (virtual)
September 8	Great Lakes Tri-Board Public Webinar – French (virtual)