ONE HUNDRED AND TWELFTH PROGRESS REPORT
to the
INTERNATIONAL JOINT COMMISSION

by the

INTERNATIONAL ST. LAWRENCE RIVER BOARD OF CONTROL

Covering the Period

MARCH 5, 2009 THROUGH SEPTEMBER 16, 2009

16 SEPTEMBER 2009

Cover Photo Caption: Celebrating 100 years of the Boundary Waters Treaty and 50 years of the St Lawrence Seaway: HMS Simcoe going through the seaway in 1959; *from The Saint-Lawrence Seaway Management Corporation archives*

EXECUTIVE SUMMARY

REGULATION STRATEGY AND RESULTS

Water supplies to Lake Ontario during the reporting period were above average but within the range of those used in the design of the regulation plan, Plan 1958-D. Although supplies were above average, water levels on Lake Ontario and in the St. Lawrence River were maintained within the criteria specified in the Commission's Orders of Approval.

The Board directed that Lake Ontario outflows be as specified by Plan 1958-D during the period unless short-term deviations were needed to meet critical needs. As a result of the high inflows from the Ottawa River, the Board directed that flows below those specified by Plan 1958-D be released to prevent serious flooding in the Montréal area for one week in early April and for a couple of days in early May. These flow reductions were successful in maintaining levels on Lake St. Louis below flood stage. These deviations were then offset with a series of over-discharge deviations during the latter part of April and in the first week of May. These discretionary deviations from Plan 1958-D prescribed flows were achieved without causing appreciable adverse effects on other interests and maintained levels well within the regulation criteria and other requirements of the Commission's Orders of Approval

Lake Ontario began the reporting period about 23 cm (9.1 in) above average and with about 0.8 cm (0.3 in) less water removed from Lake Ontario relative to a strict adherence to Plan 1958-D. The lake level rose gradually to a peak of 75.21 m (246.75 ft) on 16 May and again 29 May to 1 June. At the end of the reporting period, the lake level was 3 cm (1.2 in) above average and the same as it would have been had Plan 1958-D been strictly followed. Levels in the Port of Montréal have remained near or above average since December 2008.

BOARD ACTIVITIES

The Board, in conjunction with its staff, monitored water levels and flows carefully and reviewed its regulation strategy monthly. It issued news releases on its strategies and rationale after each regulation decision. The Regulation Representatives continued to inform and advise the Board on current and expected conditions in the system, including risk assessments. The Operations Advisory Group continued to apprise the Regulation Representatives of operational requirements and constraints.

Two new members joined the Board during the reporting period and a third returned. The Board met face-to-face twice, on 31 March and 15-16 September and met once by teleconference on 15 July. The Board held a workshop in Oswego, NY on 17-18 March to begin exploring how to better understand and take into consideration environmental impacts through discretionary deviations under the board's current authority.

The Board held its spring meeting/teleconference with the public on 17 March from Oswego, NY. 25 members of the public attended and 24 people called in. The Board held its fall meeting/teleconference with the public on 15 September 2009 from Burlington, Ontario. About two dozen members of the public attended and over 45 people called in.

The Communication Committee continued to provide advice and assistance to the Board in planning and carrying out its communication activities. A new webpage is ready for launch.

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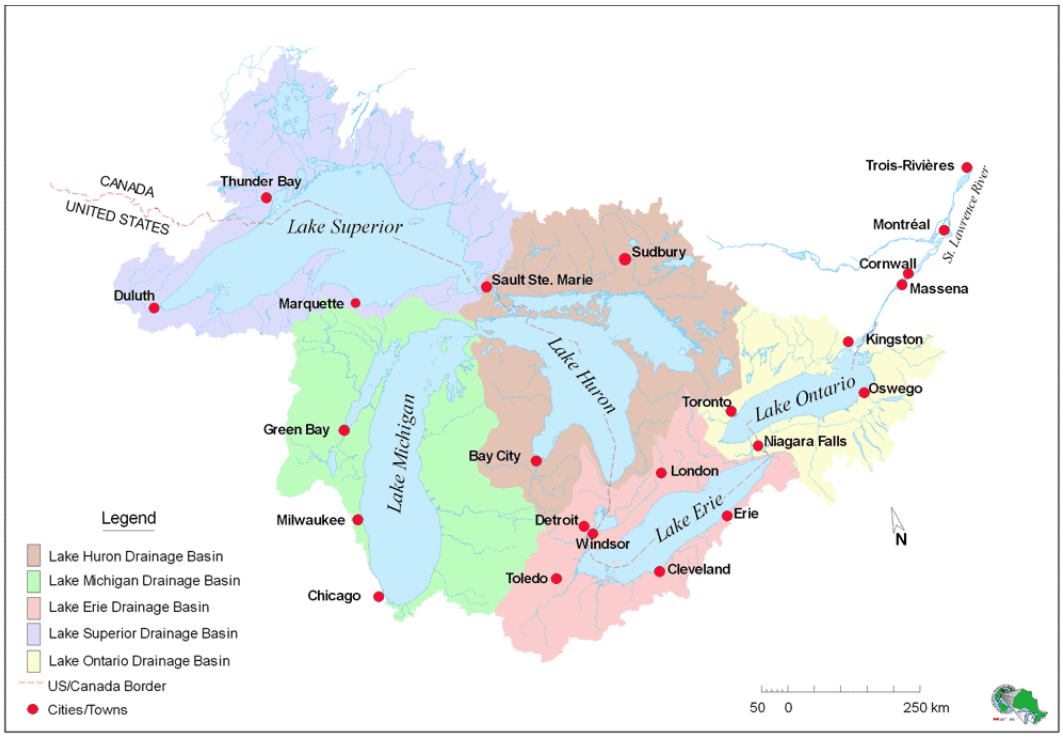

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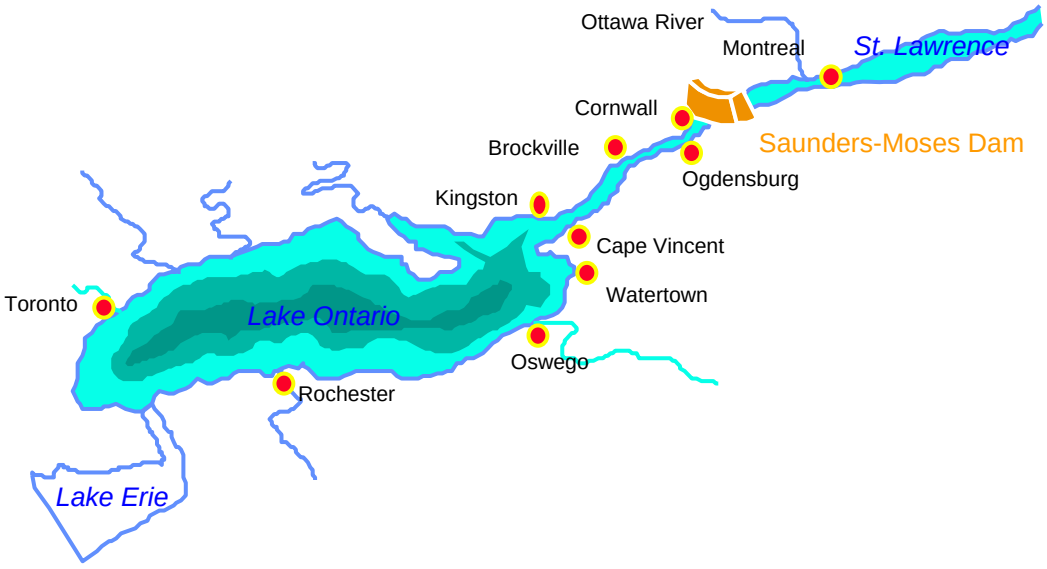

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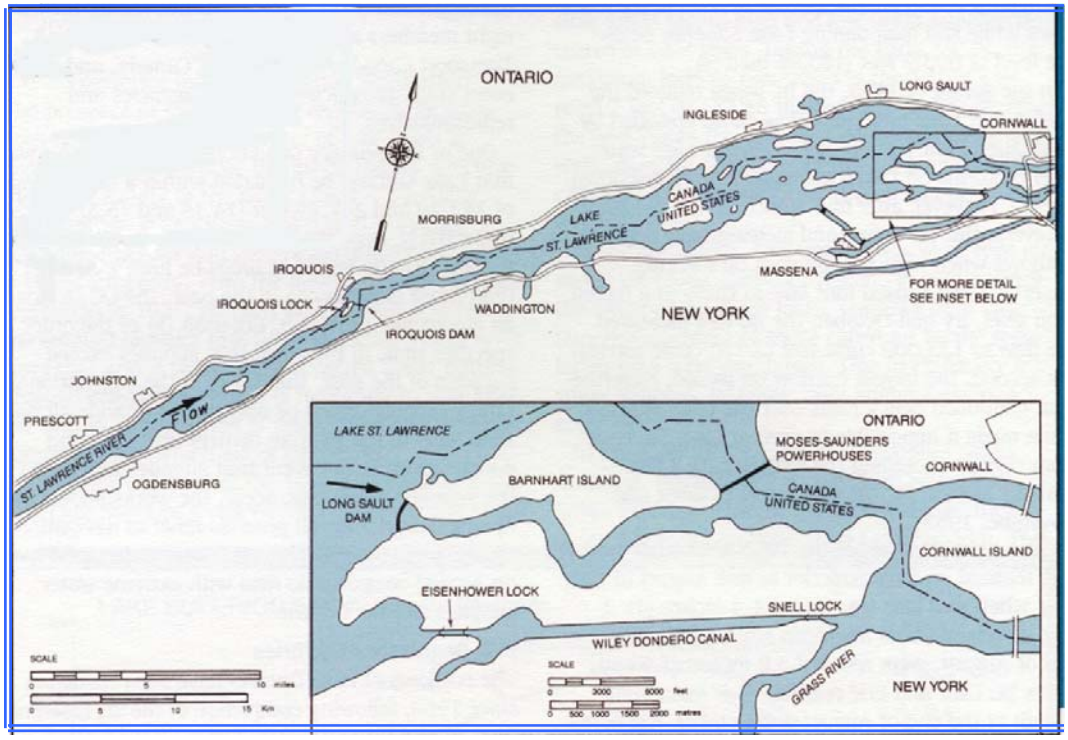
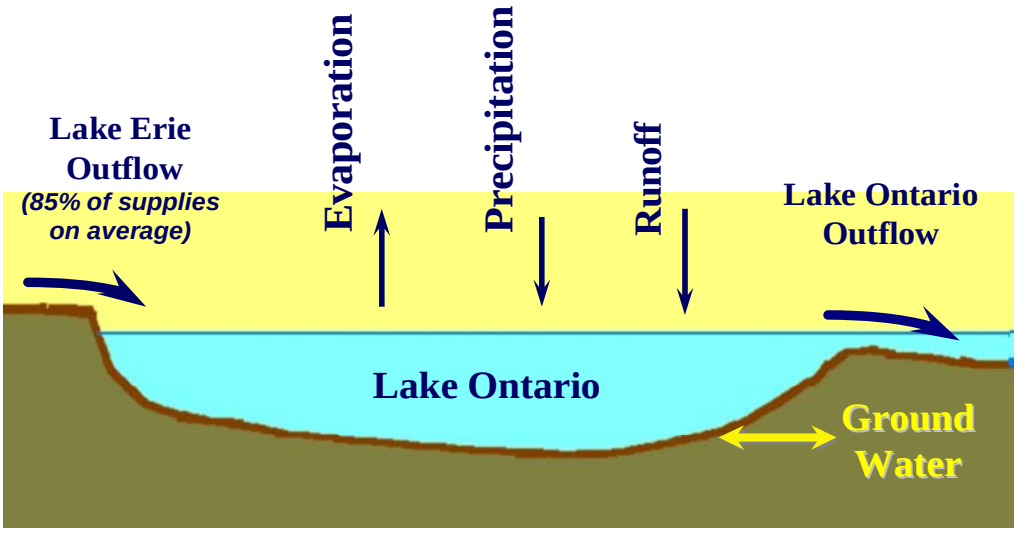


Figure 4. Factors Affecting the Still Level of Lake Ontario



1 HYDROLOGICAL CONDITIONS

Lake Ontario is the furthest downstream of the five Great Lakes. It receives the outflow of Lakes Superior, Michigan, Huron and Erie (Figure 1). From a long-term perspective, about 85 percent of the water received by Lake Ontario comes from the upstream Great Lakes. Lake Ontario outflows are controlled at a location about 160 kilometres (100 miles) from the Lake (Figure 2), with almost all of the water going through the Moses-Saunders powerhouse. Prior to construction of the powerhouse and navigation locks (Figure 3), the flow out of Lake Ontario was controlled by a set of rapids that began about 110 kilometres (70 miles) downstream of the Lake, near the towns of Ogdensburg, New York and Prescott, Ontario.

Water supply to Lake Ontario is composed of four main factors (Figure 4): inflow from Lake Erie through the Niagara River and Welland Canal diversion, precipitation on the surface of the Lake, runoff from streams and groundwater flowing into the Lake, and evaporation of water from the Lake. In addition, water for consumptive use is taken from the Lake. None of these factors are controlled.

In this report, supplies to Lake Ontario are reported in terms of Net Basin Supplies and Net Total Supplies. The definitions of these terms are as follows:

The Net Basin Supply is the net of the amount of precipitation over the Lake, runoff to the Lake, including groundwater, and evaporation and consumptive uses from the Lake's surface. Precipitation and runoff are estimated by measurements but it is not possible to accurately measure evaporation and consumptive uses. Therefore, the Net Basin Supply is estimated as the difference between the Lake's outflow down the St. Lawrence River and inflow from Lake Erie, plus any change in storage within the Lake itself as a result of a rise or fall in the Lake's level. An indicator of the amount of spring runoff that may be expected is obtained by monitoring the snow pack in the basin.
The Net Total Supply is obtained by adding to the Net Basin Supply the inflows from Lake Erie through the Niagara River and Welland Canal. The Niagara River flow is computed using a stage-discharge relationship for the Niagara River below Niagara Falls and adding the flow through the hydropower turbines located along the Niagara River.

1.1 Net Basin Supply to Lake Ontario

The monthly local net basin supplies for March through August 2009 are provided in Table 1 and shown on Figure 5. Figure 5 also shows the long-term average monthly net basin supplies, and supplies for 2007 and 2008. The horizontal bars above and below the plots are the recorded maximum and minimum long-term monthly net basin supplies.

The monthly net basin supplies were above average throughout the reporting period. The six-month average NBS would be expected to be exceeded about 20% of the time.

1.1.2 Precipitation

Monthly precipitation amounts for the Lake Ontario and Great Lakes basins for March through August 2009 are provided in Table 2 and shown on Figure 6. Figure 6 also shows the long-term average, monthly maxima and minima, and precipitation for 2007 and 2008.

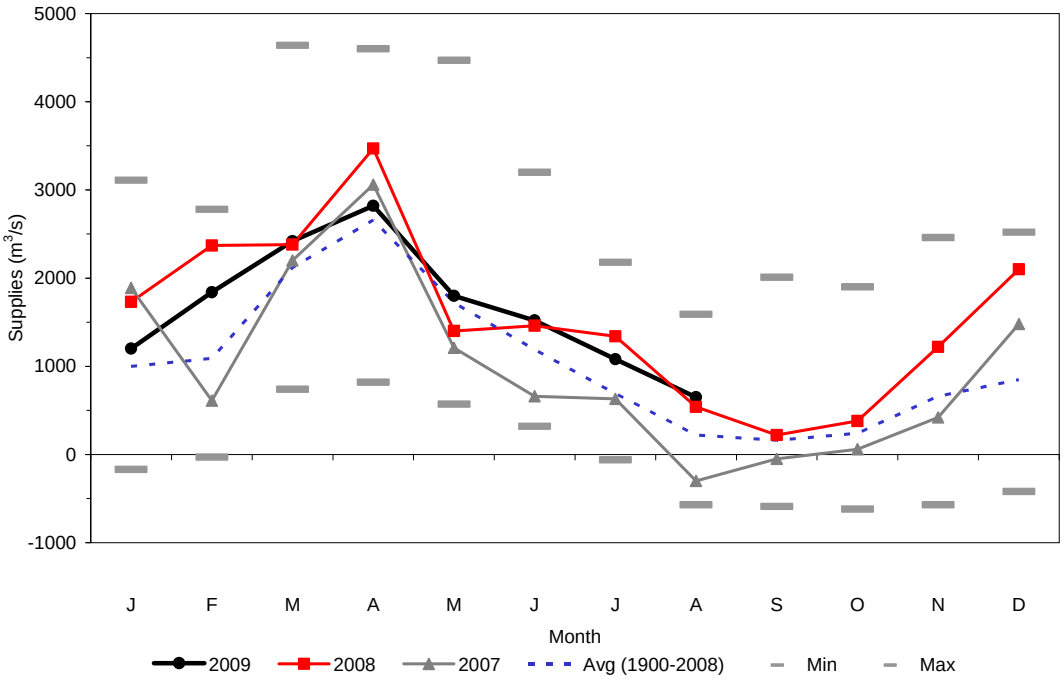
Monthly precipitation in the Lake Ontario basin was average in March and has been above average since. The total amount of precipitation received in the basin over the 6-month period was 518 mm (20.4 in.) which was 113% of average and has been exceeded 20% of the time.

Table 1. Monthly Mean Supplies to Lake Ontario

2009	Inflow from Lake Erie				Local Net Basin Supplies			Total Supplies			
	m^3/s	tcfs	Exceed. Prob.(1)	% of LTA (1)	m^3/s	tcfs	Exceed. Prob. (1)	m^3/s	tcfs	Exceed. Prob. (1)	% of LTA (1)
Mar	6320	223	19	111	2420	85	32	8740	309	22	112
Apr	6450	228	25	108	2820	100	42	9270	327	30	108
May	6540	231	32	105	1800	64	42	8340	295	36	105
Jun	6210	219	50	100	1520	54	22	7730	273	35	104
Jul	6350	224	37	104	1080	38	16	7430	262	23	109
Aug	6220	220	38	103	650	23	11	6870	243	21	110

(1) Based on period of record 1900-2008

Figure 5. Net Basin Supply to Lake Ontario



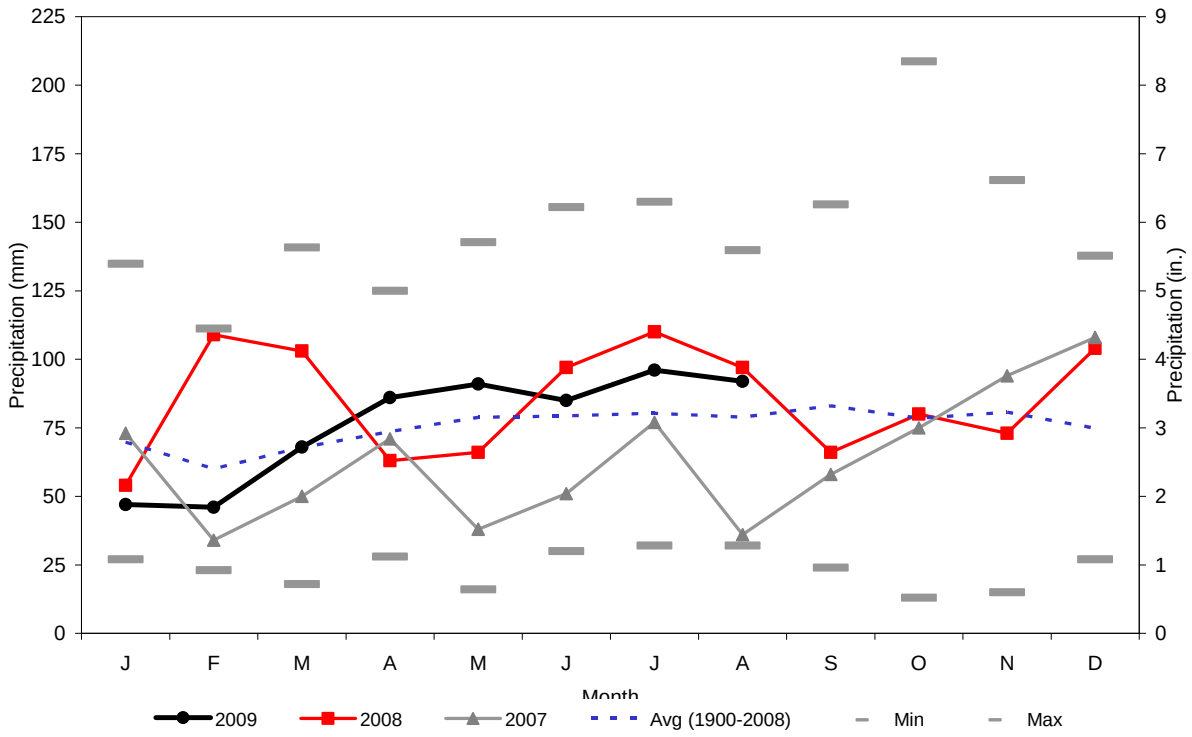
By comparison, 476 mm (18.7 in.) of precipitation fell in the entire Great Lakes basin, which was about 108% of average and has been exceeded 22% of the time. The precipitation on the Great Lakes basin was above average in March, April and August after being slightly below during the summer on the Lake Ontario basin.

Table 2. Precipitation over the Lake Ontario and Great Lakes Basins

2009	Great Lakes Basin			Lake Ontario Basin		
	mm (inches)(1)	% of LTA(2)	Exceed. Prob.(3)	mm (inches)(1)	% of LTA(2)	Exceed. Prob.(3)
Mar	62 (2.43)	113	32	68(2.67)	100	48
Apr	85 (3.35)	133	12	86 (3.38)	116	30
May	72 (2.83)	94	56	91 (3.57)	115	35
Jun	80 (3.13)	99	52	85 (3.33)	108	41
Jul	74 (2.91)	92	64	96 (3.76)	120	24
Aug	103 (4.05)	129	12	92 (3.64)	116	28

(1)Provisional
(2) Based on period of record 1900-2008
(3) Based on period of record 1900-2006

Figure 6. Precipitation over Lake Ontario Basin



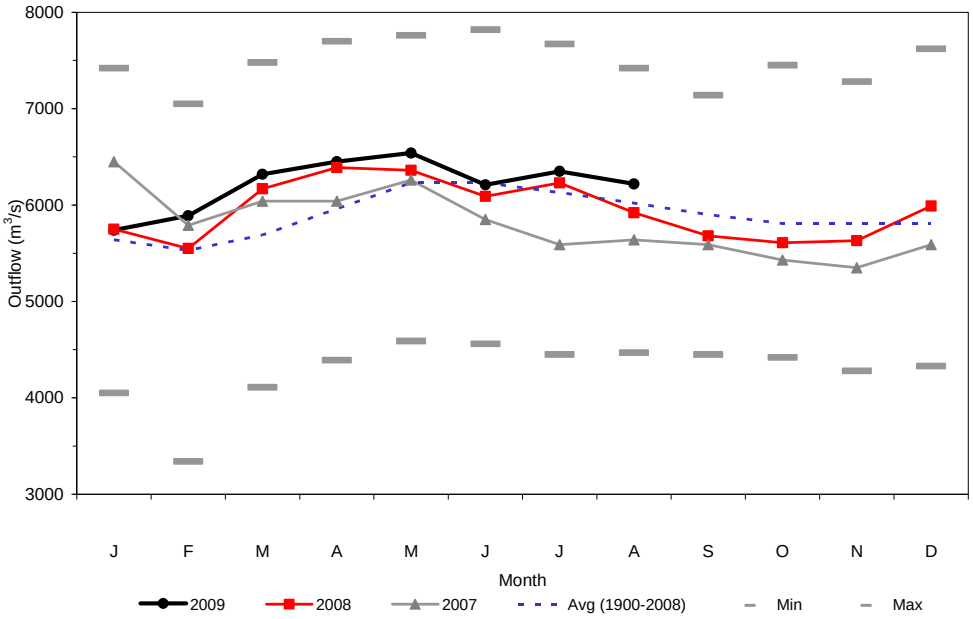
1.1.2 Snow-pack on the Lake Ontario Basin

The snow-pack on the Lake Ontario basin at the start of the reporting period was below average except at the eastern end. This resulted in less than average snowmelt throughout the region. Because of the limited snowpack data and lack of skill in predicting future precipitation, it is difficult to forecast the volume of spring runoff.

1.2 Supply from Lake Erie

Inflows to Lake Ontario from Lake Erie during the reporting period are provided in Table 1 and shown in Figure 7. Inflows from Lake Erie were above average throughout the reporting period, with the exception of June, when inflows were near average. The six-month average inflow would be expected to be exceeded 32% of the time.

Figure 7. Supply from Lake Erie



1.3 Net Total Supply to Lake Ontario

The monthly net total supplies to Lake Ontario for the March through August 2009 period are provided in Table 1 and shown in Figure 8. For comparison purposes, the six-month net total supplies for the past ten years are provided in Table 3 and Figure 9. The monthly net total supply was above average every month of the reporting period. Overall, the six-month net total supply from March to August was the highest in the past ten years and would be expected to be exceeded 25% of the time.

Figure 8. Net Total Supply to Lake Ontario

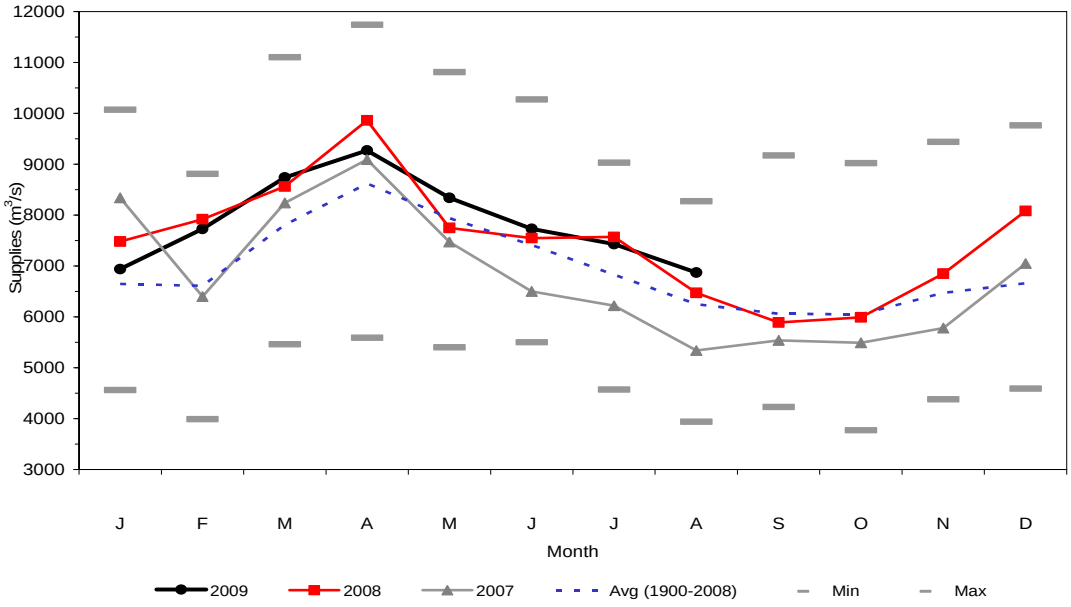
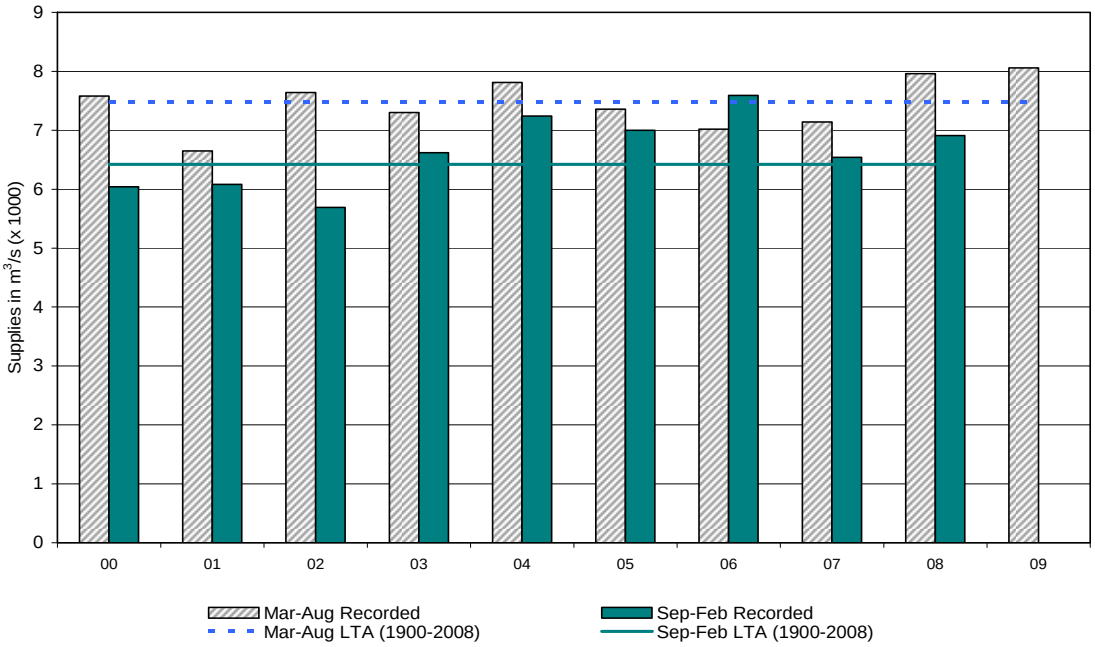


Table 3. Average and Recorded Six-Month Net Total Supplies (Mar-Aug)

	Long-Term Average [1]		**Recorded**			**Recorded Below (-) or Above Average (+)**		
	(m^3/s)	(tcfs)	(m^3/s)	(tcfs)	Exceed.Prob.[1]	(m^3/s)	(tcfs)	Percent
Mar–Aug 00	7480	264	7580	268	45	100	4	1
Mar–Aug 01	7480	264	6650	235	83	-830	-29	-11
Mar–Aug 02	7480	264	7640	270	42	160	6	2
Mar–Aug 03	7480	264	7300	258	58	-180	-6	-2
Mar–Aug 04	7480	264	7810	276	36	330	12	4
Mar–Aug 05	7480	264	7360	260	55	-120	-4	-2
Mar–Aug 06	7480	264	7020	248	70	-460	-16	-6
Mar–Aug 07	7480	264	7140	252	64	-340	-12	-5
Mar–Aug 08	7480	264	7960	281	29	480	17	6
Mar–Aug 09*	7480	264	8060	285	25	580	20	8

[1] Based on period of record 1900-2008

Figure 9. Lake Ontario Average & Recorded Six-Month Net Total Supplies



1.4 Ottawa River Basin

Outflows from the Ottawa River were above average at the beginning of the reporting period, then climbed to well-above average values for the first half of April. Following the passing of the two freshet peaks (8 April and 2 May), outflows generally remained slightly above average until the end of July. Due to heavy, persistent rainstorms across the region, outflows during the first week of August rose to record high values for that time of year. Ottawa River outflows remained above average at the close of the reporting period.

2 REGULATION OF FLOWS & LEVELS

2.1 Application of Regulation Plan 1958-D

The Board assures that the provisions of the Commission's Orders of Approval relating to Lake Ontario-St. Lawrence River outflows and levels are met. Control of the outflows and levels of Lake Ontario follows a regulation plan that was designed to satisfy the criteria set out in the Commission's 1956 Orders and other requirements that were established to balance the benefits of regulation among various interests. The current plan of regulation, Regulation Plan 1958-D, was adopted by the Commission in 1963.

In 1961, the Commission authorized the Board to deviate from the outflows specified by the regulation plan in order to provide additional benefits to interests when this could be done without appreciable adverse effects on other interests. Today, the Board reviews conditions in the Great

Lakes and Lake Ontario-St. Lawrence River basins at least monthly and establishes outflow strategies for the coming weeks that may or may not include deviations from Plan flows.

The outflow from Lake Ontario is computed weekly by following the procedure laid out in the Board's July 1963 Report to the Commission on Regulation Plan 1958-D. The computational procedure includes the following steps (the reader is referred to the Board's 1963 Report for additional details and considerations):

- Calculation of a provisional flow based on present conditions in the system (e.g., recent supplies and current/computed levels);
- Checking the provisional outflow against operational limits designed to protect interests; and,
- Setting a final 'Plan' outflow.

The Plan outflow is then reviewed by the Board's Regulation Representatives and Operations Advisory Group (OAG), and assessed against the Board's current outflow strategy and the current operational requirements of domestic water supply, navigation, power and other interests in the system. If all are in agreement, the Regulation Representatives, on behalf of the Board, recommend an outflow for the coming week to the Government representatives who direct the hydropower entities (who operate the structures that control the outflows) on the outflow. If not all OAG members and Regulation Representatives agree on the flow for the coming week, the Board of Control is called upon to decide.

To aid in decision making, the Board analyses includes the risk of exceeding the criteria of the Orders and other water level indicators developed by the Board through experience.

2.2 Board Regulation Strategies and Actions

The Board, in conjunction with its staff, monitored water levels and flows carefully and reviewed its regulation strategy monthly. It issued news releases on its strategies and rationale after each regulation decision. In order to be responsive to changing conditions and the needs of interests, the Board schedules monthly teleconferences to review conditions in the Great Lakes-St. Lawrence River system and develop outflow strategies to respond to conditions and ensure that the Board is able to offer assistance to interests in times of critical need. The outflow strategies are designed to enhance the benefits provided by Regulation Plan 1958-D while not causing appreciable adverse effects to any interest. The strategy decisions made during the reporting period, and their rationales, are available on the Board's Website, maintained by the Canadian Coast Guard, at www.islrbc.org.

The Board's strategy during the reporting period was to generally release the flows specified by Plan 1958-D, but to intervene as necessary to meet critical needs using its authority to make short-term deviations. As a result of high inflows from the Ottawa River, the Board directed that flows below those specified by Plan 1958-D be released to prevent serious flooding in the Montréal area early in April and for a couple of days in early May (see Figure 10 and Table 4). This year, Lake Ontario rose gradually to a peak of 75.21 m (246.75 ft) on 16 May, fell slightly in the following days and then crested again on 29 May to 1 June at that level (see Figure 11). As the risk of flooding near Montreal subsided, Lake Ontario outflows were increased gradually, and deviations were then offset with a series of over-discharge deviations during the latter part of April and in the first week of May. By 8 May, all of the water that had been temporarily stored on Lake Ontario (relative to strict adherence to Plan 1958-D) was removed. Plan-prescribed outflows were released the remainder of the reporting period.

The discretionary deviations from Plan 1958-D prescribed flows were achieved without causing appreciable adverse effects on other interests and maintained levels well within the regulation criteria and other requirements of the Commission's Orders of Approval.

2.2.1 Deviations from Regulation Plan 1958-D

Table 4 summarizes the Board's discretionary deviations during the reporting period. The Board deviated three times from Plan-prescribed outflows. At the beginning of the reporting period, 0.8 cm (0.3 in.) of water had been removed from Lake Ontario due to previous deviations. Early in March, a steady flow was maintained (below Plan-prescribed outflows) to maintain a safe ice cover. In early April, flows were reduced to prevent downstream flooding (from high Ottawa River inflows), then outflows were raised in mid April in order to remove this temporarily stored water from Lake Ontario and reduce the Lake's level. A third deviation occurred at the beginning of May when flows were again reduced to lower the risk of flooding downstream and later increased to remove the temporarily stored water. Discretionary deviations never exceeded 0.8 cm (0.3 in.). Plan-prescribed outflows were released the balance of the reporting period.

Table 4. Summary of Outflow Deviations from Regulation Plan 1958-D Outflow

Date 2009	Deviation (cms)	Dev. (cms-wks)	Acc. Dev. rounded (cms-wks)	Cum. Effect on Lake Ont. rounded (cm)	Reason for Deviation
Mar 5			**270**	**-0.8**	
Mar 5-6	-30 for 48 hrs	**-9**	**260**	**-0.8**	Winter Operations – Ice Management
Apr 5-7	-400 for 59 hrs	**-140**			Pt. Claire approaching Flood Stage
Apr 7	-700 for 9 hrs	**-38**			Pt. Claire approaching Flood Stage
Apr 7-8	-1200 for 16 hrs	**-114**			Pt. Claire approaching Flood Stage
Apr 8	-800 for 12 hrs	**-57**			Pt. Claire levels declining
Apr 9	-500 for 21 hrs	**-63**			Pt. Claire levels declining
Apr 9-10	-200 for 25 hrs	**-30**	**-180**	**0.6**	Pt. Claire levels declining
Apr 11	-260 for 22 hrs	**-34**			Pt. Claire levels declining
Apr 11-12	-130 for 26 hrs	**-20**			Pt. Claire levels declining
Apr 17	160 for 24 hrs	**23**	**-210**	**0.7**	To reduce stored water
Apr 18-24	100 for 168 hrs	**100**	**-110**	**0.3**	To reduce stored water
Apr 25-May 1	110 for 168 hrs	**110**	**0**	**0.0**	To reduce stored water
May 2-3	-130 for 48 hrs	**-37**			Pt. Claire approaching Flood Stage
May 4-8	50 for 120 hrs	**36**	**0**	**0.0**	To reduce stored water

Figure 10. Lake Ontario Daily Outflows for 2009

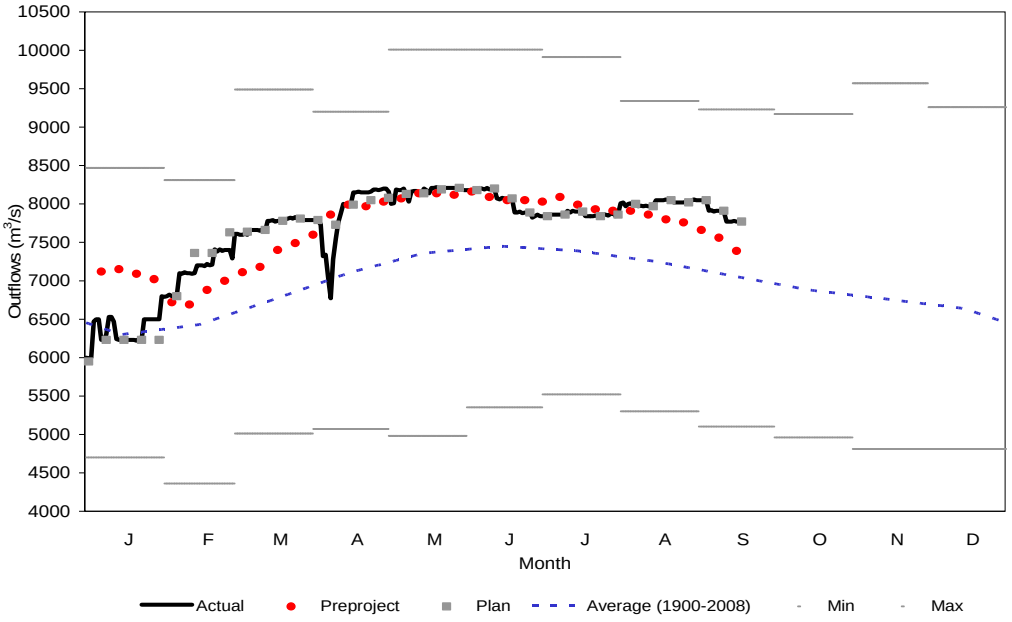
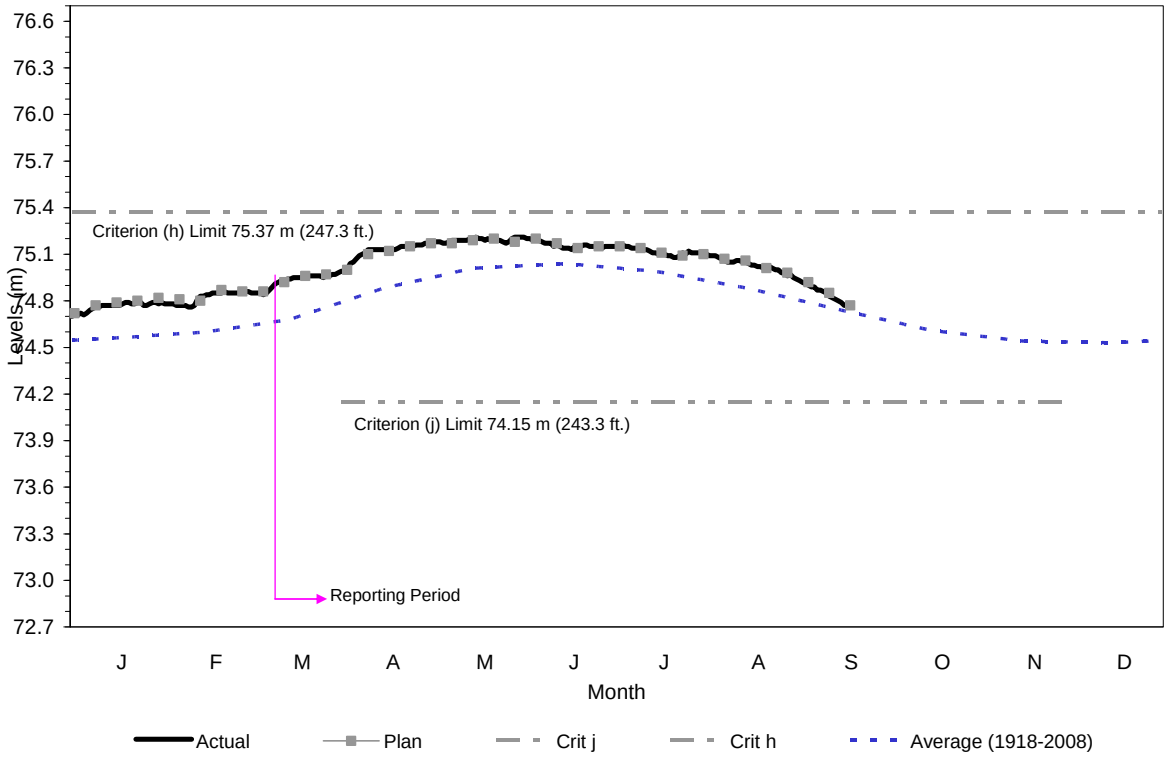


Figure 11. Lake Ontario Actual and Plan Levels for 2009



2.2.2 Ice Management

The hydropower entities install a series of ice booms each winter in the international section of the River to aid in the formation and stabilization of the ice cover. The booms are normally removed as the ice deteriorates locally.

Ice cover deteriorated rapidly after the first week of March. Lake St. Lawrence was ice free by 10 March, and ice cover had dissipated by 21 March in the Beauharnois Canal.

This year, all booms in the international section were removed by 26 March, without incident or problem.

2.2.3 Iroquois Dam Operations

Under the conditions of paragraph (j) of the Commission's Order of Approval dated 29 October 1952, the power entities are permitted to operate Iroquois Dam with Board approval. The gates of the dam can be lowered into the water to assist in ice formation and to reduce the level of Lake St. Lawrence when there are low outflows. Boaters must use the Iroquois lock to bypass the dam when the dam gates are in use.

The gates at Iroquois Dam were lowered from 8 to 11 April, to help suppress high Lake St. Lawrence levels.

2.3 Results of Regulation

2.3.1 Upstream

<u>Lake Ontario</u>

The effects of Regulation Plan 1958-D and the Board's outflow strategies on the level of Lake Ontario are shown in Figures 11 and 12.

On 5 March, the beginning of the reporting period, the daily level of Lake Ontario was 20 cm (8 in.) above average. The lake level rose at its typical rate and peaked at 75.21 m (246.75 ft.) on 16 May and again 29 May to 1 June. The level then gradually fell before stabilizing around 75.15 m (246.56 ft.) from mid-June to mid-July as above-average outflows offset above-average supplies. The level then resumed its seasonal decline and fell at its typical rate. At the end of the reporting period, the level was 74.77 m (245.30 ft), about 3 cm (1.2 in.) above average. The monthly levels of Lake Ontario ranged from a low of 74.92 m (245.80 ft.) in March to a high of 75.19 m (246.69 ft.) in May, and declined to the end of the reporting period to below the low March level, within the 1.22 m (4-ft.) regulatory range.

As a means of informing the Commission on the impacts of regulation activities on levels and outflows, the Board provides the Commission with a comparison of Lake Ontario's actual monthly levels and outflows to those that would have been obtained under pre-project conditions (that is, the levels and outflows that would have occurred had regulation not been undertaken). A summary of this comparison for the reporting period is provided in Table 5. Figure 13 provides a comparison of the actual daily levels with the long-term average, weekly computed Plan 1958-D and pre-project levels. Lake Ontario remained between 29 to 31 cm (11 to 12 in.) lower than it would have been without regulation.

Figure 12. Daily Water Levels on Lake Ontario

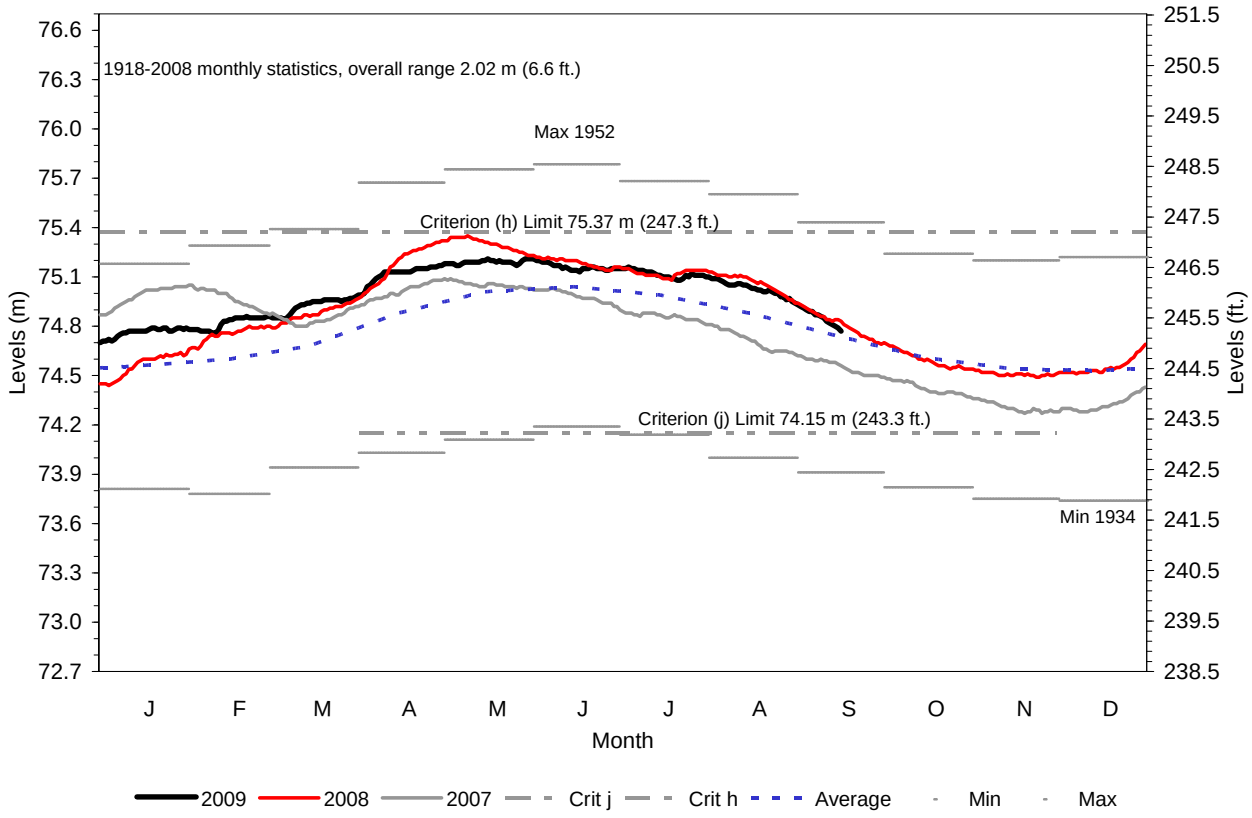
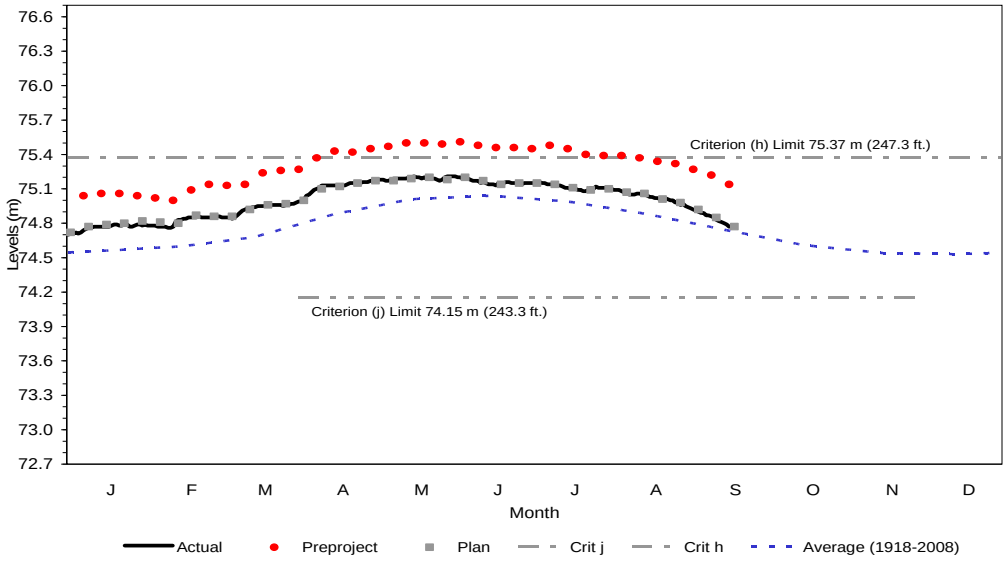


Table 5. Lake Ontario Recorded and Pre-Project Levels and Outflows

2009	Lake Ontario Monthly Mean Water Levels (IGLD 1985) - meters (feet)			Lake Ontario Monthly Mean Outflow m^3/s (tcfs)		
	Recorded	Pre-project	Diff.	Recorded	Pre-project	Diff.
Mar	74.92 (245.80)	75.21 (246.75)	-0.29 (-0.95)	7730 (273)	7370 (260)	360 (13)
Apr	75.12 (246.45)	75.41 (247.41)	-0.29 (-0.96)	7880 (278)	7960 (281)	-80 (-3)
May	75.19 (246.68)	75.49 (247.67)	-0.30 (-0.99)	8170 (289)	8120 (287)	50 (2)
Jun	75.16 (246.58)	75.46 (247.57)	-0.30 (-0.99)	8050 (284)	8070 (285)	-20 (-1)
Jul	75.12 (246.45)	75.42 (247.44)	-0.30 (-0.99)	7860 (278)	7980 (282)	-120 (-4)
Aug	75.03 (246.16)	75.34 (247.18)	-0.31 (-1.02)	8020 (283)	7800 (275)	220 (8)

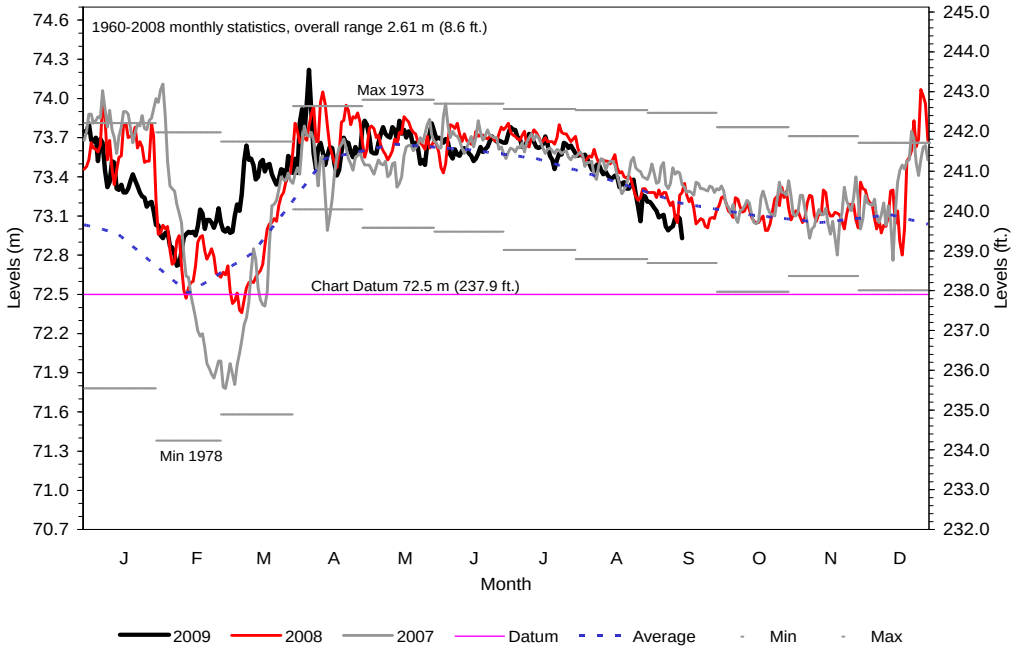
Figure 13. Lake Ontario Actual, Pre-Project and Plan Levels for 2009



Lake St. Lawrence

The daily levels on Lake St. Lawrence (Figure 14) were well above average until 8 April when outflows were increased gradually as the threat of downstream flooding subsided. Levels then generally remained near average until late June, when outflow limitations within Plan 1958-D and high Lake Ontario levels resulted in Lake St. Lawrence levels rising back above average. The level declined to close to average conditions by late August and continued to fall thereafter.

Figure 14. Water Level on Lake St. Lawrence (at Long Sault Dam)



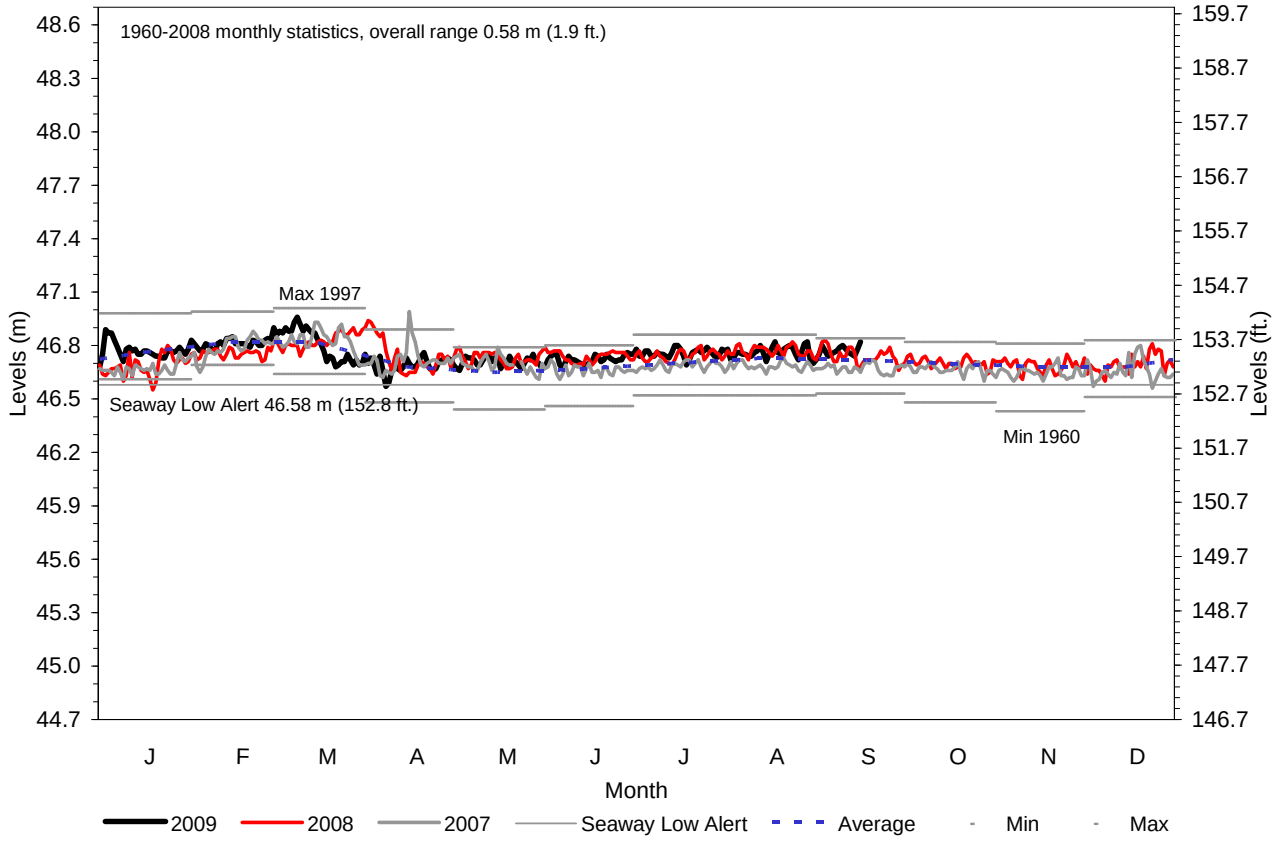
2.3.2 Downstream

Lake St. Francis

The regulation of Lake Ontario outflows has a limited effect on the levels of Lake St. Francis, as the lake level is regulated by hydropower plant operations at Beauharnois and Les Cèdres, Québec. The historic range of monthly mean levels on Lake St. Francis since completion of the Saunders-Moses project is about one-fifth that of Lake St. Lawrence.

The daily levels on Lake St. Francis at Summerstown (Figure 15) were near to slightly above average throughout the reporting period.

Figure 15. Water Level on Lake St. Francis (at Summerstown)



Lake St. Louis

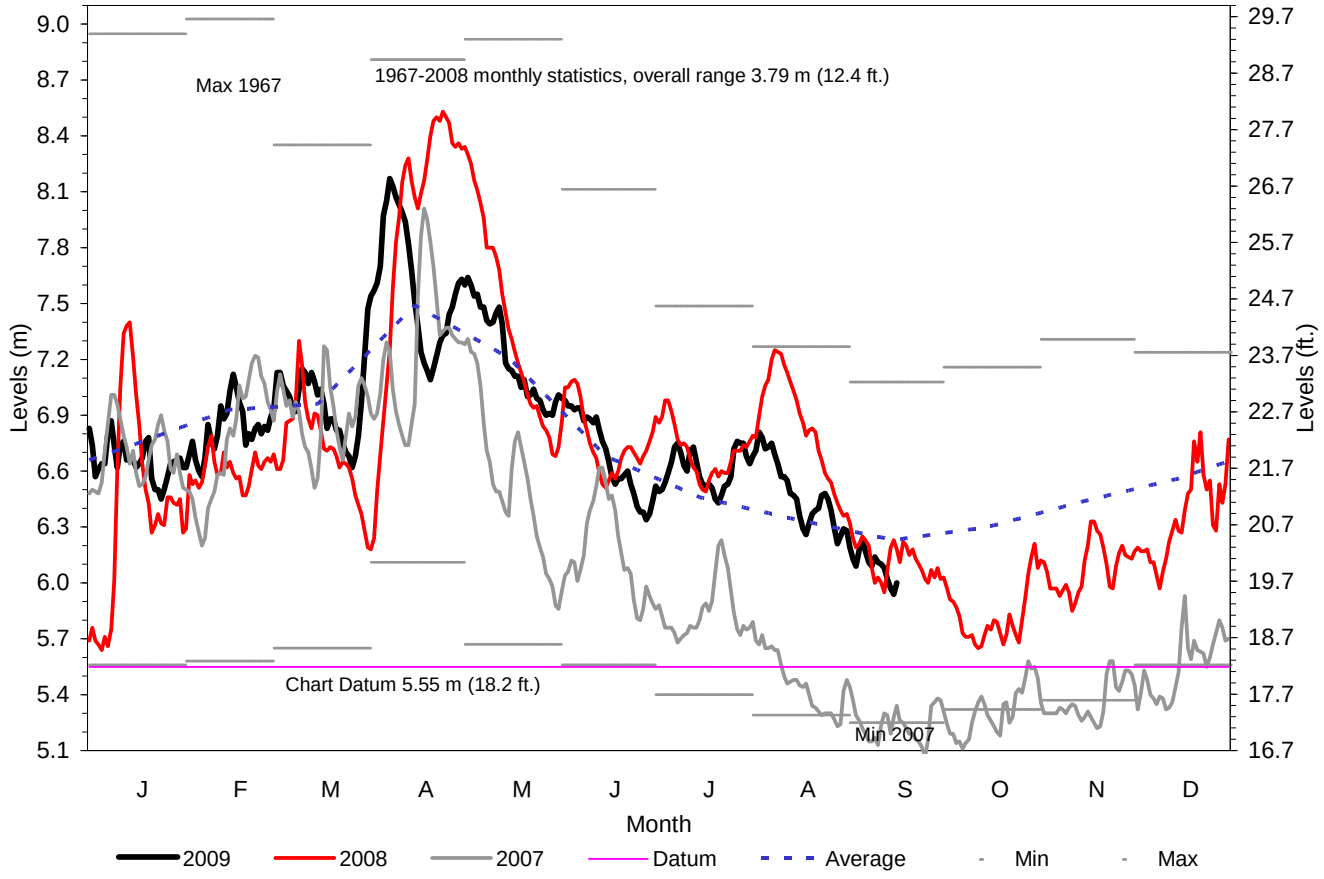
Lake St. Louis water levels are influenced by the discharges from both the St. Lawrence and Ottawa Rivers. The daily water levels on Lake St. Louis at Pointe-Claire (Figure 16) generally remained above average for the entire reporting period. On 7 April, they briefly exceeded the flood alert level [22.10 m (72.5 ft)] but remained below the flood stage level [22.33 m (73.3 ft)] due to the deviations below plan outflow from Lake Ontario undertaken by the Board.

Figure 16. Water Level on Lake St. Louis (at Pointe-Claire)

Port of Montreal

Water level fluctuations in Montreal Harbour are influenced by the discharges from the St. Lawrence and Ottawa Rivers, winds, the tide, and in winter, by downstream ice conditions. The daily water levels in Port of Montreal (Figure 17) went from below average in late March to a peak of 8.17 m, well above average, on 7 April during the spring freshet. By 15 April water levels had dipped below average until 26 April. They remained near average from then until late June. Water levels fluctuated in July and August from above to near average in response to rainfall runoff in the region, falling below average later in September.

Figure 17. Water Level in the Port of Montréal (at Jetty #1)



3 BOARD ACTIVITIES

3.1 Board Meetings & Conference Calls

The Board continued to oversee the operations of 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 and Ottawa River systems. The Regulation Representatives provided the Board with weekly regulation data, monthly reviews of the hydrological conditions, monthly risk analyses using water level outlooks, and advised the Board on regulation strategy options and their potential impacts on water levels and interests throughout the system. The Board's Operations Advisory Group (OAG) held weekly teleconferences to apprise the Regulation Representatives of operational requirements and constraints. The Committee on River Gauging continued to monitor the Power Entities' program for operation and maintenance of the gauging system required for Board operations, and report annually.

The Board continued to assess conditions in the basin and adjust its regulation strategy at least monthly through meetings, conference calls, telephone and e-mail. The Board met twice face-to-face, on 31 March in Washington, DC and on 15-16 September in Burlington, Ontario. The Board

met once by teleconference, on 15 July. Table 6 provides a list of Board Members in attendance at these meetings and teleconference.

The Board continued to liaise with the IJC regarding the possible new Order of Approval and regulation plan for the Lake Ontario-St. Lawrence River system. In that regard, the Board held a workshop in Oswego, NY on 17-18 March to begin exploring how to better understand and take into consideration environmental impacts through discretionary deviations within its current authority. The summary and conclusions of this workshop are included in an appendix.

3.2 Meetings with the Public and Input from the Public

The Board held its spring meeting/teleconference with the public on 17 March from Oswego, NY, where 25 members of the public attended and 24 people called in. The Board provided an update of current water level conditions and received comments and questions. The most common concern expressed by the public related to Lake Ontario shore erosion and their belief that the above average lake levels were exacerbating storm damage. Several asked the Board to reduce the lake levels. One stated that they thought that lake levels were allowed to get too low in the fall for boating. The Board explained that the lake levels were well within the range specified by the Commission's criteria. There were also questions related to the outcome and status of the Commission's review of the Lake Ontario - St Lawrence River regulation.

The Board held its fall meeting/teleconference with the public on 15 September 2009 from Burlington, Ontario, where about two dozen members of the public attended and over 45 people called in. Most people are aware that the high water supplies resulted in the water levels and outflows experienced. Some expect that outflow regulation can maintain levels to their liking throughout the Lake Ontario - St Lawrence system. Some asked that levels be lowered to reduce shore property erosion, while others asked for higher levels to better accommodate their boating activities. Some stated that a range of levels is needed to maintain a healthy diversity of wetland plants, and requested that both higher and lower lake levels be allowed to occur. However, many participants do ask whether other factors are significant. Some questioned the impact of wind setup, wave action, shoreline profiles, silting processes, the lack of marina channel maintenance, and climate change. The Board provided explanations. IJC representatives also reported on the progress of potential new Orders of Approval and regulation plan following the Lake Ontario - St Lawrence River Study.

During the reporting period, the Communications Committee, individual Board Members and the Secretaries continued to actively engage in outreach, information exchange and liaison with stakeholders throughout the Lake Ontario-St. Lawrence River system. Board members and staff responded to a number of inquiries from the general public concerning water level conditions and the Board’s strategies.

4. COMMUNICATIONS COMMITTEE REPORT

The Board continued to work with the IJC through the Communications Committee to seek opportunities to improve communications with the public. Peter Yeomans became the new Canadian Board member on the committee. IJC staff have developed a new webpage for communication by the Board to the public.

Routine communication activities carried out during the reporting period included:

- Preparation of news releases: The Board issued news releases after each regulation decision, to provide the public with recent information on water level conditions, regulation strategies and rationale;

- Operation of the Board's 1-800 numbers: The Board continued to post weekly updates of levels and flows. In the U.S., the number is 1-800-883-6390, and in Canada the numbers are 1-800-215-8794 (English) and 1-800-215-9173 (French);

- Operation of the Board's new Web Page on the Internet: The existing webpage maintained by the Canadian Coast Guard, http://www.islrbc.org/ will point to the new page. The Page includes:
  - Weekly updates on water levels and outflows;
  - General information about the Board, its activities, mandate, and structure;
  - Announcements about Board-related meetings/teleconferences with the public and events;
  - Announcements about the Board's outflow strategies and related news releases;
  - Posting of the Board's meeting minutes and teleconference summaries, as well as information bulletins and progress reports;
  - A copy of the IJC Orders of Approval;
  - Links to related water level, outflow, and weather data;
  - Links to related Websites; and
  - Frequently asked questions.

- The Board's spring and fall meeting/teleconference with the public (Section 3.2);

- The Board's Regulation Representatives send out weekly updates on Lake Ontario regulation and water level and outflow conditions, as well as the Board's news releases and public meeting notices, to a list of over 260 e-mail subscribers which continues to grow.

The U.S. Army Corps of Engineers has announced tat it intends to hire a communications specialist part-time to assist the Board. This person is expected to begin assisting the Board by late fall and will focus on priority issues identified jointly by the Board and IJC staff.

5 RIVER GAUGING COMMITTEE REPORT

The Board's St. Lawrence Committee on River Gauging monitors the Power Entities' program of operating and maintaining 15 water level gauges required for the Board's monitoring of water levels and flows related to the operation of structures and forebay elevations. This includes annual inspections of the water level gauging network. The Committee also ensures the accuracy of flow and water level measurements. This includes annual inspections of the computational methods used at each of the eight outflow structures as well as auditing the Power Entities' data processing. The Committee is charged with providing the Board with an annual report on the inspection results and computed outflows.

The Committee continued to monitor, facilitate and report on progress made by the responsible agencies in follow up to recommendations appearing in Committee's reports that were adopted by the Board.

The 2007 report was submitted on 24 April 2009 and approved on 16 September by the Board. The 2008 report will be submitted to the Board in the near future.

5.1 Water Level Gauges

Gauge monitoring activities proceeded routinely during the reporting period.

5.2 Raisin River Diversion

The Raisin River Diversion was opened on 9 September and still in operation on 16 September. The diverted outflow was less than 0.1 m^3/s (3.5 cfs), which has a negligible impact on operations. The diversion channel remains severely overgrown with vegetation, which restricts the amount of water diverted. The diversion is used to augment low flows in the headwaters of the South Branch of the Raisin River.

5.3 Turbine Upgrades

Moses Unit 31 was removed from service for upgrade on 2 August 2008, and was returned to service on 29 April 2009. Moses Unit 32 was removed from service for upgrade on 1 May 2009 and is expected back in service on 18 December 2009. Finalized rating tables for the upgraded Baldwin-Lima-Hamilton units: 17, 18, 21, 22, 25, 26, 29, and 30 were issued as of 30 June 2009, and are in the process of being reviewed to obtain Board approval. Post upgrade field testing of unit 27 (the first of the upgraded Allis-Chalmers units) took place from 23 October to 6 November 2008.

5.4 Cornwall Canal

This canal historically served as the navigation canal. Since the canal was closed to navigation in 1959, a diversion of water into the canal has continued in order to provide industrial water supply, dilution of urban stormwater discharging into the canal and fish habitat. The amount diverted had long been at a constant flowrate of about 5.7 m^3/s (200 cfs), but with the recent closure of the last industrial user, Ontario Power Generation (OPG) reduced the flow in the canal on 1 June 2009 by about 1.1 m^3/s (39 cfs) to 4.6 m^3/s (162 cfs). This was approximately the amount in the agreement between OPG and the industrial user. OPG has initiated a review of the flows through the canal to determine any environmental impacts of reducing flows through the canal. Should environmental conditions allow, the diversion could be reduced further and the water utilized to increase power production by both NYPA and OPG. OPG is currently rating the latest valve setting to ensure the canal supply is adequate and will make further measurements at various valve settings to ensure accurate flow measurements can be made.

6 ST. LAWRENCE SEAWAY REPORT

The Seaway navigation season for the Montreal-Lake Ontario Section officially opened 31 March with the first vessel, the MV Spruceglen, going through the International Section in the early hours of 1 April 2009 March. Maximum vessel draft was limited to 80.0 dm due to ice conditions until 3 April, at which time favourable water levels permitted maximum draft to be increased to 80.8 dm.

7 HYDROPOWER PEAKING AND PONDING

By letter dated 13 October 1983, the Commission authorized Ontario Power Generation and the New York Power Authority to continue to carry out peaking and ponding operations at the St. Lawrence Project. Conditions governing peaking and ponding operations are specified in Addendum No. 3 to the Operational Guides for Regulation Plan 1958-D. On 9 September 2008, the IJC renewed the approval for three years or until new Orders of Approval are issued.

Peaking operations were conducted during the reporting period, but no ponding operations were conducted.

8 BOARD and COMMITTEE MEMBERSHIP CHANGES

Due to the absence of Mr. Lorquet, Mr. Carpentier graciously continued in the role of the Canadian Co-Chair at the beginning of the reporting period. Mr. Jim Vollmershausen was appointed Canadian Co-Chair on 5 June 2009. Mr. Vollmershausen is a Canadian federal public servant, currently serving as the Regional Director General of the Ontario Region of the department of Environment Canada. Mr. Vollmershausen has many years experience in water and environmental management.

The Board expressed its deepest sympathies on the passing of Mr. Jacques Lorquet on 14 July. Mr. Lorquet served the Board well for seven years, providing leadership and expertise as Canadian Co-Chair.

Mr. Tom Brown was appointed to the U.S. Section of the Board on 31 March 2009. Mr. Brown is an Environmental Consultant, former Regional Director and career employee with the New York State Department of Environmental Conservation, and a return member to the International St. Lawrence River Board of Control.

Ms. Joan Frain was appointed to the Canadian Section of the Board on 20 July 2009. She is a civil engineer with 27 years experience in water management, and is currently Manager - Water Policy and Planning in the Water Resources and Aboriginal Relations Division of Ontario Power Generation. Ms. Frain also currently serves on a number of other Regulatory Boards.

After careful assessment of its roles and responsibilities, Fisheries and Oceans Canada (DFO) has concluded that membership on the ISLRBC is no longer a function that should be undertaken by the Canadian Coast Guard. Mr. Breton has informed the Board that he will continue as a member until the conclusion of the IJC's 2009 semi-annual meetings. With his departure, there will be one vacancy on the Canadian Section of the Board.

Ms. Gail Faveri, from Environment Canada, succeeded Mr. Flavio D'Agnolo, of DFO as Canadian Secretary on 6 July 2009.

Table 6

Attendance at Meetings and Teleconferences (5 March – 16 September 2009)

Board Member	Country	31 Mar. Mtg.	15 Jul. T. Conf.	15-16 Sep. Mtg.
Mr. J. Bernier	U.S.	X	X	X
Mr. D. Breton	Can.	X	X	
Mr. T. Brown[1]	U.S.	N/A	X	X
Mr. A. Carpentier	Can.	X	X	X
Col. J. Drolet[2]		N/A	N/A	X
Ms. J. Frain[3]	Can.	N/A	N/A	X
Dr. T. Hullar	U.S.	X		X
Mr. J. Lorquet[4]	Can.	N/A	N/A	N/A
Col. V. Quarles[5]	U.S.	X	X	
MG John W. Peabody[6]	U.S.			
Dr. F. Sciremammano, Jr.	U.S.	X	X	X
Mr. J. Vollmershausen[7]	Can.	N/A	X	X
Mr. P. Yeomans	Can.		X	X

Notes:
1. Appointed to U.S. Section on 31 March 2009
2. Represented U.S. Co-Chair in absence of MG Peabody and Col. Quarles
3. Appointed to Canadian Section on 20 July 2009
4. Canadian Co-Chair (Mr. A. Carpentier acted as Canadian Co-Chair during Mr. J. Lorquet's absence)
5. Alternate U.S. Co-Chair
6. U.S. Co-Chair
7. Canadian Co-Chair, appointed 5 June 2009.

Location of Meetings:
31 March 2009, Washington, D.C.
15-16 September 2009, Burlington, Ontario

Respectfully submitted,

Members for Canada	**Members for the United States**
J. Vollmershausen, Chair	MG J. W. Peabody, Chair
A. Carpentier	J. Bernier
D. Breton	T. Hullar
P. Yeomans	F. Sciremammano, Jr.
J. Frain	T. E. Brown

APPENDIX I

Abbreviations and Terms Used in this Report

actual (data)	the actual recorded value
avg	average
Board	International St. Lawrence River Board of Control (unless otherwise specified)
cfs	cubic feet per second
cm	centimetre(s)
cms	cubic metres per second
Commission	International Joint Commission
computed level, outflow	the level or outflow computed by Regulation Plan 1958-D
deviation (outflow)	a Lake Ontario outflow different from the Plan 1958-D outflow
exceedence probability	the percent of time that the value was exceeded in the past
ft	foot/feet
IJC	International Joint Commission
ISLRBC	International St. Lawrence River Board of Control
in	inche(s)
Lake	Lake Ontario (unless otherwise specified)
level	water level
LTA	long-term average
m	metres
m^3/s	cubic metres per second
mm	millimetres
NYPA	New York Power Authority
OAG	the Board's Operations Advisory Group
OPG	Ontario Power Generation
Peaking	hour-to-hour flow changes over the course of a day
Plan	Regulation Plan 1958-D
Ponding	day-to-day flow changes over the course of a week
pre-project	the levels and outflows that would have occurred had regulation not been undertaken
regulation	management of levels and flows in the Lake Ontario-St. Lawrence River system by physical control of outflows from Lake Ontario
Regulation Plan 1958-D	current plan of regulation for Lake Ontario
Seaway	the St. Lawrence Seaway (commercial navigation facility)
Study Board	International Lake Ontario-St. Lawrence River Study Board
supply	quantity of water received
tcfs	thousand cubic feet per second

APPENDIX II

Report Summarizing the Workshop on Discretionary Deviations from Regulation Plan 1958 D and the Environment

1.1 ... March 31, 2009

The International St. Lawrence River Board of Control held a workshop on March 17-18, 2009, in Oswego, New York, with approximately 30 participants to begin exploring how to better understand and take into consideration environmental impacts through discretionary deviations under the board's current authority. Workshop goals included helping the Board learn what environmental information is available from the Lake Ontario – St. Lawrence River Study, considering the possible use of this information, and considering steps forward.

Background

The Board determines the outflows from Lake Ontario into the St. Lawrence River in accordance with a legal framework (Orders, 1952, revised 1956) and an operational plan (Plan 1958D, 1963) approved by the International Joint Commission. The Commission also provided the Board with the authority to deviate from the flow determined by Plan 1958D under certain circumstances, including in 1961 for what are known as "discretionary deviations." Discretionary deviations can be undertaken to provide beneficial effects or relief from adverse effects to an interest, when doing so will not cause appreciable adverse effects to any other interests or endanger meeting the criteria and other requirements of the Commission's Order.

The Commission is reviewing its Orders and considering various alternative operational plans. Pending a final decision, the Commission has asked the Board to consider how to better understand and take into account environmental impacts through temporary deviations under its current authority because of evidence from the 5-year Lake Ontario – St. Lawrence River Study (2006). Considerable data, models and information acquired during the Study show that there have been both mixed and negative environmental impacts, perhaps the most notable being a decline in the wetlands diversity of the Upper River and Lake Ontario, under the current regulation plan as implemented. The Study developed and evaluated several plans that are better in this regard. The Commission stated in a September 4, 2008 letter to the U.S. Department of State and the Foreign Affairs Canada that, in the interim, the Board may take into account all the information developed during the study in considering discretionary deviations, including the impact of discretionary deviations on the environment. The Board and the Commission subsequently discussed this possibility in greater detail, which led as a first step to the organization of this workshop.

Workshop Components

The workshop included presentations (available upon request) on the following topics: the criteria and other aspects of the Order of Approval, Plan 1958D and how it calculates outflows, the authority provided to the Board for discretionary deviations, example deviations taken by the Board under that authority, environmental work from the Lake Ontario – St. Lawrence River study that might be relevant to consideration of discretionary deviations, and preparatory adaptive management efforts to date in U.S. and Canadian federal

agencies (particularly with respect to the Lake Ontario – St. Lawrence River Study.) Much time was spent in discussion.

Observations

- The Board focuses heavily on current and projected water levels and flows in considering possible discretionary deviations. Impacts are considered qualitatively through the experience of Board members, and quantitatively when information is available, but the Board does not typically perform an after-the-fact comprehensive assessment to determine actual impacts to all interests.

- The Board has previously taken the environment into account in making its discretionary deviations (such as in response to a request from a downstream environmental agency to assist with fish spawning; note that not all requests are accepted.) These environmental considerations may have been requests from government agencies or based on knowledge of one or more Board members.

- The Board does not have full environmental information, modeling, and expertise available to it at present for its discretionary decision-making.

- The Lake Ontario – St. Lawrence River Study was developed to assess candidate plans under a variety of conditions occurring over the long term, with evaluations of indicators over minimum periods of a century. Discretionary deviations are focused on what flow to release in the short term – often for a week or less. The good information in the Study may not be framed in a way that directly facilitates short-term trade-off assessment and decision-making (e.g., one can't compare relative impacts to different environmental performance indicators because their scales are different.)

- There is some promise of avoiding environmental harm or effecting environmental benefits in the Lower St. Lawrence River, where water levels respond more rapidly to flow changes from discretionary deviations than they do on Lake Ontario.

- Work on the Lake Ontario – St. Lawrence River Study by experts from Environment Canada and Quebec produced a Lower River environmental chart showing preferred water level ranges over critical time periods for species week-by-week. This chart shows some potential for future use by the Board.

- Because of its large surface area, discretionary deviations rarely change Lake Ontario's water levels by more than a centimeter or two over the course of a week. The cumulative result of several weeks of deviations can change the lake level more substantially. In the past decade, the greatest effect has been a change of 22 cm compared to the plan level, but more typically lake level effects from discretionary deviations are in the order of millimeters.

Conclusions

- Some small benefits for the environment may be possible through discretionary deviations, and probably only in the St. Lawrence River. Greater changes, including long-term improvement of wetlands, require a new Plan and/or Order.

- Workshop participants agreed that it is not possible to implement a significantly different plan (e.g., Plan 2007 or Plan B+) via discretionary deviations, if that were desired, because of limitations in the Board's current authority.

- Short-term deviations (days, weeks or a few months) are more likely to fall within the Board's authority than long-term deviations (many months, years or decades.)

- Lake Ontario often requires multi-year phenomena to effect environmental benefits, but the St. Lawrence River operates on an annual cycle (it is more dynamic, and has greater variability.) Therefore, environmental deviations for the river show greater promise, but also have greater uncertainty/risk. (For example, a short-term flow change may be potentially effective, but the river's short-term variability makes multi-week forecasting more uncertain with potential for a desired environmental effect to be unrealized.)

- The 12 environmental performance indicators for the lower river from the Lake Ontario – St. Lawrence River Study are not in opposition (e.g., an increase in flow to assist one is unlikely to pose negative consequences for the others.)

- Tools exist to show potential short-term environmental impacts on the lower river, most notably via a 2-dimensional model prepared by Environment Canada.

Possible Direction

Workshop participants discussed three primary approaches: creating institutional linkages to improve board access to environmental information and concerns, better documenting and codifying the range and practice of discretionary deviations, and developing guidelines and information for potential Board operational use.

Creating Institutional Linkages. Workshop participants agreed that it should be possible to make institutional changes relatively quickly, with needed resources limited to possible travel and other minor costs. Thus, while it is worth considering on its own merits, it may also provide an interim step if also considering actions that would take longer or require greater resources. The following institutional options were considered (options are not mutually exclusive.)

- *Board membership*. Increase environmental expertise on the board by asking the Commission to fill current vacancies. Discussion ensued around not appointing an environmental activist, but rather a person that can take a system-wide approach, understand that he/she does not represent an agency or interest, and can work cooperatively with others to achieve consensus.

- *Environmental Advice*. Include people with environmental expertise on the Board's Operations Advisory Group or establish an Environmental Advisory Group. Members could be drawn from academics and/or environmental agencies. Some suggested including those involved in furthering the Lake Ontario Lakewide Management Plan (LaMP) or the State of the Lakes Ecosystem Conference (SOLEC). Ties to the Lake Ontario LaMP or SOLEC may facilitate linking Great Lakes Water Quality Agreement issues with water regulation issues and promote more of a watershed approach. (It was mentioned that these latter groups' interests is only the upper part of the system where discretionary deviation water level changes are smallest.) Questions were raised as to whether the environmental advisory

group should operate separately from the Operations Advisory Group, or whether integration should occur in advance of advice being provided to the Board.

- *Requests.* Increase awareness that the Board considers requests for discretionary deviations, including for environmental issues, as one means of helping surface potential environmental concerns or opportunities. The Board may need to ask the requester to specify impacts that would result from the requested change.

Documenting/Codifying Discretionary Deviations. The following suggested actions would capture and document Board experience. They would also provide information on the scale of discretionary deviations, which could help bound generally what may or may not be possible through the Board's current authority, including for environmental purposes. Agency expertise is available to carry out these tasks, but is currently committed (or over-committed.) Priorities would need to be adjusted to free personnel within the next year, likely affecting timeframes for the ongoing Upper Great Lakes Study, or other personnel would need to be identified, possibly with funding implications.

- *Simulate Discretionary Deviations.* Compare computer simulations of 1958DD, and 1958DD with appropriate deviations removed, in order to determine the impacts of the Board's past discretionary deviations. The simulation of 1958DD with criterion k and, if possible, ice management deviations separated, would codify the best indication of normal board use of discretionary deviations.

- *Improve Documentation.* Better document board experience with discretionary deviations (what does it do, when, why, and what are the impacts.)

Developing Guidelines and Information. The options listed below (not mutually exclusive) provide examples and tools for board operational use. Further refinement would be required for many options, suggesting a time lag before results could be utilized. Information from the Lake Ontario – St. Lawrence River study would need to be transformed for operational use. Expertise to undertake this transformation would likely need to be drawn from more than a single expert given the breadth and complexity of environmental issues and differences among Lake Ontario, the upper St. Lawrence River upstream of the dam (including Lake St. Lawrence), and the lower St. Lawrence River downstream of the dam. Funding may also be required to support this work.

- *Sample Environmental Discretionary Deviation*. Develop an example where a feasible discretionary deviation would have positive environmental impacts. Environmental experts at the workshop indicated that it would be possible to review past circumstances to identify circumstances where a discretionary deviation taken, or one avoided, could have had positive environmental impacts.

- *Systematic Review.* Perform a systematic review of potential indicators and opportunities from the Lake Ontario – St. Lawrence River study, transforming available information into a form suitable for operational purposes. This would include environmental issues as well as the development of a more explicit set of factors affecting other interests that are taken into consideration by the Board.

- *Single Species Examination.* Develop a list of opportunities for a single species (e.g., muskrat): under what conditions would small flow change be helpful?

- *"Flag Sheet" or Criteria.* Develop a "flag sheet" with the timing of the most promising environmental indicators, to include an explanation of desired outcomes with respect to water levels and flows (e.g., fish reproduction, bird nesting, etc.) Alternatively, form a group to develop hydrologically-based environmental criteria from the Lake Ontario – St. Lawrence River Study, with impacts identified.

- *Test Modeling*. Run a computer simulation of "1958-DE" (reflecting possible environmental deviations) in parallel with actual board-determined flows to determine impacts and gain experience. Alternatively, run 1958-DE for an earlier 3-year period to see what effect environmental deviations could have had.

- *Pilot Adaptive Management*. Establish a pilot adaptive management effort: consider the monitoring, reporting and assessment associated with discretionary deviations to be a small-scale test of subsequent adaptive management. The Board provides a structure for doing so, and links could be considered to State of the Lakes Ecosystem Conference work. Links could also be looked for to integrate activities for adaptive management in work (activities, agreement) already realized in the system by agencies. Cautions were expressed about the difficulties of narrowing what is proposed for monitoring, and potential funding needs were flagged.

Participants also discussed possible opportunities for promoting desired actions:

- *Request funding from the International Joint Commission through its International Watershed Initiative (IWI).* Participants noted that efforts to better integrate water regulation with water quality and biological issues are consistent with the IWI. The Commission has a framework for considering proposals from various Boards for funding, and has funding available for the IWI. A proposal from the Board could be either for scoping or implementing suggested work. Participants suggested that the Board may also wish to consider associated communications issues, either incorporating them into any proposal submitted (stakeholder involvement is an integral component of the IWI) or combining them with previously-flagged communications needs.

- *Request that the Commission (1) send letters to agencies asking for assistance, and/or (2) ask the U.S. Department of State and Foreign Affairs Canada to coordinate activities and funding related to environmental monitoring and assessment*. Letters to agencies might affect agency priorities, which in the U.S. might influence decisions regarding stimulus funding expected by agencies such as NOAA and EPA.

References: Documents provided by workshop organizers and participants

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- *Report prepared by E. Bourget, CEIWR*