

## The history of the Order and plan

In 1952, the International Joint Commission of Canada and the United States issued an Order of Approval, amended in 1956, for the construction of the hydroelectric power project at Cornwall, Ontario and Massena, New York. Operation of this project determines the outflow from Lake Ontario and affects water levels and flows on Lake Ontario and on the St. Lawrence River to Trois-Rivières, Quebec.

Nearly 50 years later, in response to concerns from shoreline property owners, recreational boaters and environmentalists, and to take into account changes in the conditions and technology, the Commission established an independent, U.S.-Canadian Study Board (the Study Board) in 2000 to undertake a five-year review of the 1956 Order. In its recommendations issued in May 2006, the Study proposed three options to the Commission: Plans A+, B+ and D+. The Commission was not obliged to choose any of the three plans.

After detailed review of the Study recommendations, in 2007 the Commission developed for consideration a proposed new Order and regulation plan: Plan 2007. The Commission will make a final decision on a proposed new Order and regulation plan after consulting with the U.S. and Canadian Governments, meeting with other authorities, and reviewing the results of public hearings and other comments on the drafts. In addition to the proposed new Order and Plan 2007, the Commission is addressing three related matters:

- monitoring and adaptive management;
- adjustments to the institutions that manage the regulated Lake Ontario outflows; and
- guidance for short-term deviations from the regulation plan.

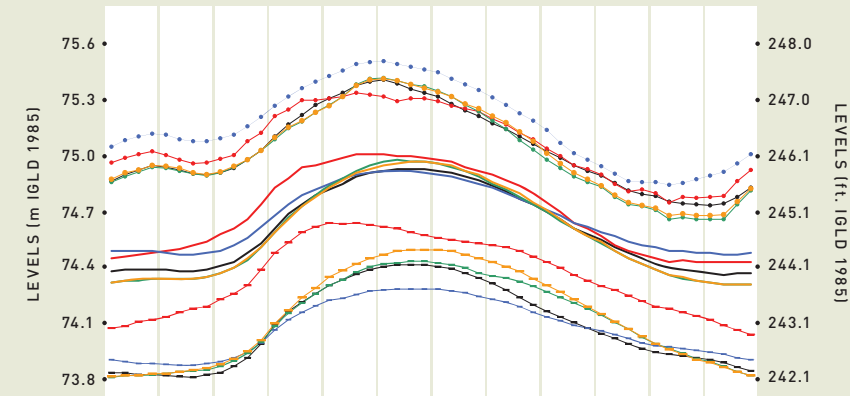
## HIGHS, MEDIUMS AND LOWS

The following graphs show the expected high, medium and low water levels at three key locations in the system for all plans under consideration.

### ALEXANDRIA BAY WATER LEVELS

AVERAGE, 1% AND 99% PROBABILITY OF EXCEEDENCE PLOTS

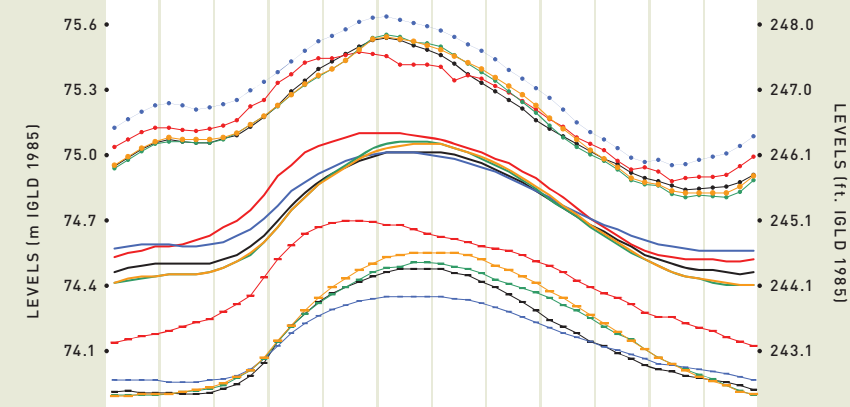
In the Upper River, Plan 2007 (in yellow) avoids extremes while producing overall benefits to the environment. Plan B+ (in blue) has higher highs and, in some cases, lower lows than other plans.



### LAKE ONTARIO WATER LEVELS

AVERAGE, 1% AND 99% PROBABILITY OF EXCEEDENCE PLOTS

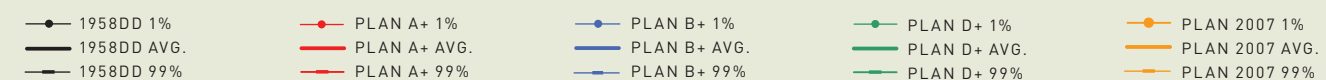
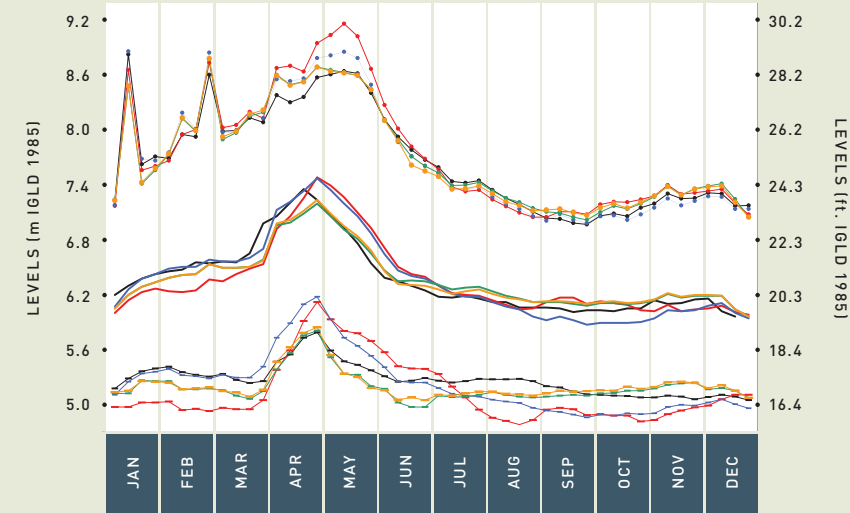
Plan B+ (blue) produces better environmental results through more variability in levels while Plan 2007 (yellow) strikes a balance that conserves more of the benefits currently provided under regulation.



### MONTREAL JETTY #1 WATER LEVELS

AVERAGE, 1% AND 99% PROBABILITY OF EXCEEDENCE PLOTS

Plans A+ (red) and B+ (blue) produce both higher and lower levels in some months. Plan 2007 (yellow) stays in the middle of the pack.



FOR CONSIDERATION AND DISCUSSION:

## Proposed new Order and Plan 2007

## Moving forward: A proposed new Order and plan

The International Joint Commission has released a proposed new Order of Approval and plan for regulation of the levels and flows in the Lake Ontario-St. Lawrence River system through the dam at Cornwall-Massena.

Plan 2007 and the proposed new Order is the best option that can be developed at this time, given the requirements of the Boundary Waters Treaty and the goals set by the two federal governments when the Project was developed in the 1950's. Compared to the current plan, it is an improvement with respect to environmental and overall economic benefits and takes a more balanced approach to all interests. The Commission has a strong interest in providing additional environmental benefits at the level provided in plans based on more natural flows (B+-based plans). However, the Commission finds it is impossible to do so at this time without unduly reducing the benefits and protections currently accorded to other interests.

It may be possible to further develop Plan B+ to achieve greater environmental benefits while addressing the related negative impacts to other interests. This would require measures (known as "mitigation") to compensate or assist those whose current benefits are at stake. The development and implementation of mitigation is primarily the responsibility of the governments.

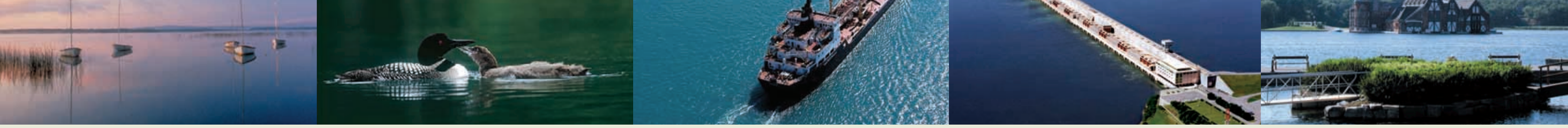
Flexibility is built into the proposed new Order to allow for a future shift from Plan 2007 to a plan with additional environmental benefits, such as a B+-based plan, when implemented mitigation may provide for such a transition.

Future Commissions thus could adopt a new regulation plan without revising the order. Change could occur whenever sufficient mitigation measures are in place and monitoring confirms they are working satisfactorily. The Commission will first consider whether suitable mitigation is in place within two years.

The proposed "adaptive management" program – a formal process for continually improving management policy and practices by learning from their outcomes – will be the key vehicle for assessing impacts to interests through monitoring and reporting, including on the implementation of mitigation measures. The governments of Canada and the United States have indicated their strong support for adaptive management and will actively participate in the further development of an adaptive management plan for implementation.

The Commission is presenting Plan 2007 and the proposed new Order for public review now, rather than staying with the current plan and Order and waiting for development of a mitigation plan. This is because the Commission believes that Plan 2007 would be an improvement over the current plan, and it is unclear when suitable mitigation measures could be developed and implemented.

Before making the final decision on a new Order and plan, the Commission will consider the public's views and seek the concurrence of the two federal governments. The Commission's goal is to sign a new Order by December 2008 and implement a new plan shortly thereafter.



# FIVE BUILDING BLOCKS

To regulate water levels and flows from Lake Ontario and much of the St. Lawrence River through the Moses-Saunders Dam, the International Joint Commission (IJC) is considering a proposed new Order and regulation plan (Plan 2007) and will make a final decision after consulting with governments and reviewing public comments. The proposed new Order and plan provide more transparent and predictable regulation under a wide range of conditions. In addition, they allow for significant improvements in wetland health and biodiversity.

## 1 → Proposed new Order of Approval

The proposed new Order provides the legal framework and authority for the continued operation of the Moses-Saunders Dam. Unlike the current 1956 Order, it makes explicit provision for recreational boating and the environment. Also, it continues to provide for those interests named in the Boundary Waters Treaty and the current Order, and brings into one place related authorities (such as for placing and removing ice booms). The proposed new Order provides a revised framework for the Commission's Board that will oversee the Order's implementation. It also provides for a regulation plan and includes provisions for monitoring and adaptive management in order to confirm that the new Order and plan produce the expected benefits and impacts and in order to make long-term improvements.

The proposed new Order would also allow the Commission to move to a regulation plan based on more natural flows, such as a variant of Plan B+, should governments implement an effective mitigation plan.

## 2 → Regulation plan

After the conclusion of the International Lake Ontario-St. Lawrence River Study, the Commission requested additional work by Study experts on a regulation plan that would allow occasional low water levels to provide environmental gains, retain high water level restrictions to reduce shoreline damages, and maintain benefits comparable to those in the current Order. A new regulation plan, known as Plan 2007, is the result. This plan takes a balanced approach and has overall benefits for all interests, including the environment. Experts based this plan on a far greater range of water conditions than was considered in the 1950s, including drier and wetter conditions than have been recorded, and four climate change scenarios.

Specifically, Plan 2007 provides for an increase in environmental benefits while also maintaining the same or improved level of benefits for property owners and the shipping industry.

## 3 → Adaptive management and the new Board

To help ensure that the expected benefits are realized and that needed improvements can be made in the long term, the Commission is recommending monitoring and adaptive management, including regular periodic reviews of available information. The governments of Canada and the United States have indicated their strong support for adaptive management and will actively participate in the further development of an adaptive management plan for implementation.

The newly renamed International Lake Ontario-St. Lawrence River Board, appointed by the Commission, will have broader responsibilities for monitoring and adaptive management and system-wide oversight of the Order and regulation. As a part of its duties, the Board will manage and coordinate increased communications needs.

## 4 → Implementation

The proposed new Order provides for short-term discretionary deviations and emergency deviations. Short-term discretionary deviations are minor within-week deviations from the plan flow and are usually made up in the following week. They apply to such contingencies as hydropower unit maintenance or assistance to commercial vessels due to unanticipated low water levels. Emergency deviations are rare, but necessary under extreme conditions such as major power blackouts, major power dam shutdowns or ships sinking.

The Commission believes that, apart from emergency measures and short-term beneficial interventions, deviations from the flows determined by the regulation plan must be minimized to realize the Plan's benefits.

## 5 → Public outreach

The Board will ensure two-way communications, and public understanding of the regulation process, decision, and impacts, as well as engagement in the monitoring and adaptive management program. The Board will establish a Communications Committee to implement a communications strategy and may, at its discretion, establish an informal group of public advisors.

The Commission also plans to establish technical and policy groups charged with overseeing monitoring and assessment and with providing communication between stakeholders and the Board on matters related to adaptive management.

## Environmental Performance Indicators

→ Plan 2007 produces solid results across almost all indicators, including species at risk.

1.00 = Plan 1958D with deviations as modelled.  
0.10 PLUS or MINUS from 1.00 is considered significant (Using Historical Supply Series 1900-2000).

	A+	B+	D+	2007
<b>LAKE ONTARIO</b>				
Wetland Meadow Marsh Community	1.02	1.44	1.17	1.22
Low Vegetation 18C - spawning habitat supply	0.89	0.95	0.94	0.93
High Vegetation 24C - spawning habitat supply	1.05	1.00	1.01	1.01
Low Vegetation 24C - spawning habitat supply	1.00	1.02	1.00	1.01
Northern Pike - YOUNG OF YEAR recruitment	1.02	1.00	1.05	1.02
Largemouth Bass - YOUNG OF YEAR recruitment	0.94	0.98	0.97	0.98
Least Bittern - reproductive index	0.88	1.04	0.96	0.93
Virginia Rail - reproductive index	0.96	1.11	0.99	0.96
Black Tern - reproductive index	1.03	1.12	1.01	0.97
Yellow Rail - preferred breeding habitat	0.96	1.01	0.98	0.99
King Rail - preferred breeding habitat	1.05	1.10	1.03	1.04
<b>ABOVE THE DAM</b>				
Low Vegetation 18C - spawning habitat supply	1.01	1.01	1.01	1.01
High Vegetation 24C - spawning habitat supply	1.03	1.01	1.02	1.02
Low Vegetation 24C - spawning habitat supply	1.01	1.01	1.01	1.01
Northern Pike - YOUNG OF YEAR recruitment	1.05	1.03	1.01	1.00
Largemouth Bass - YOUNG OF YEAR recruitment	0.99	1.00	1.00	1.00
Northern Pike - YOUNG OF YEAR net productivity <sup>1</sup>	N/A	N/A	N/A	N/A
Virginia Rail - reproductive index	1.16	1.27	1.31	1.31
Muskrat - house density in drowned river mouth wetlands	1.42	4.39	1.75	2.04
<b>BELOW THE DAM</b>				
Golden Shiner - suitable feeding habitat area	1.00	1.00	1.00	0.97
Wetlands fish - abundance index	0.87	0.90	0.84	0.81
Migratory wildfowl - habitat area	1.03	1.03	0.97	1.00
Least Bittern - reproductive index	1.03	1.06	1.00	1.00
Virginia Rail - reproductive index	0.94	0.97	1.06	1.06
Migratory wildfowl - productivity	1.06	1.00	1.00	1.00
Black Tern - reproductive index	0.84	0.77	1.00	1.03
Northern Pike - reproductive area	0.97	0.94	0.94	0.90
Frog sp. - reproductive habitat surface area	0.87	0.87	1.03	1.00
Eastern Sand Darter - reproductive area	1.10	1.03	1.13	1.13
Spiny Softshell Turtle - reproductive habitat surface area	1.03	1.06	1.03	1.06
Bridle Shiner - reproductive habitat surface area	1.00	0.97	1.00	1.03
Muskrat - surviving houses	1.04	0.88	0.96	0.96
<b>PERCENTAGE 'GOOD' SCORES FOR EACH PLAN</b>	<b>6%</b>	<b>19%</b>	<b>13%</b>	<b>13%</b>

<sup>1</sup> - After the release of the Study Board's Final Report, the Study experts who developed the charts reviewed them and made a number of small adjustments to correct some minor errors and reduce duplication.

<sup>1</sup> - The Northern Pike indicator for the upper river was found to be incorrectly functioning following publication of the Study Report. Experts involved in producing the report charts conducted a subsequent review for accuracy and corrected figures are presented.

■ = Worse than Plan 1958D with deviations   ■ = Better than Plan 1958D with deviations

## Economic Performance Indicators

→ Plan 2007 produces positive or neutral results economically across nearly all interests and regions as compared to Plan 1958D with deviations.

Average annual net discounted benefits (stochastic series<sup>1</sup>). All values are millions of U.S. dollars per year.

	A+	B+	D+	2007
<b>COASTAL</b>				
LAKE ONTARIO	\$0.46	-\$2.52	-\$0.23	\$0.06
Shore Protection Maintenance	\$0.57	-\$2.16	-\$0.17	\$0.03
Erosion to Unprotected Developed Parcels	-\$0.23	-\$0.17	\$0.02	\$0.01
Flooding	\$0.12	-\$0.20	-\$0.08	\$0.02
UPPER ST. LAWRENCE RIVER	\$0.01	-\$0.01	-\$0.01	\$0.00
Flooding	\$0.01	-\$0.01	-\$0.01	\$0.00
LOWER ST. LAWRENCE RIVER	-\$0.51	-\$0.22	\$0.09	\$0.09
Flooding	-\$0.51	-\$0.22	\$0.09	\$0.09
Shore Protection Maintenance <sup>2</sup>	N/A	N/A	N/A	N/A
<b>COMMERCIAL NAVIGATION</b>				
Lake Ontario	\$0.47	\$2.13	\$1.54	\$1.69
Seaway	-\$0.03	-\$0.01	-\$0.01	\$0.00
Montreal down	\$0.57	\$2.16	\$1.56	\$1.71
	-\$0.07	-\$0.02	-\$0.02	-\$0.01
<b>HYDROPOWER</b>				
NYPA - OPG	\$2.18	\$3.86	\$0.48	\$0.77
Hydro Quebec <sup>3</sup>	\$0.55	\$2.22	\$1.16	\$1.60
<b>RECREATIONAL BOATING</b>				
ABOVE DAM	\$1.20	-\$1.42	-\$0.36	-\$0.15
Lake Ontario	\$0.70	-\$1.18	-\$0.44	-\$0.27
Alex Bay	\$0.47	-\$0.29	\$0.03	\$0.06
Ogdensburg	\$0.01	\$0.00	\$0.01	\$0.01
Lake St. Lawrence	\$0.01	\$0.05	\$0.05	\$0.05
BELOW DAM	\$2.61	\$0.68	\$1.78	\$1.47
Lac St. Louis	\$1.39	\$0.49	\$0.89	\$0.74
Montreal	\$0.93	\$0.19	\$0.68	\$0.55
Lac St. Pierre	\$0.29	\$0.00	\$0.21	\$0.18
<b>TOTAL</b>	<b>\$6.68</b>	<b>\$4.72</b>	<b>\$4.43</b>	<b>\$5.53</b>

<sup>1</sup> - After the release of the Study Board's Final Report, the Study experts who developed the charts reviewed them and made a number of small adjustments to correct some minor errors and reduce duplication.

<sup>1</sup> - A statistically simulated series of years, using a sample of actual historic years as the raw data, to test different regulation plans by simulating conditions such as droughts and floods.

<sup>2</sup> - The lower river Shore Protection and Maintenance indicator was not calculated for the full stochastic series by the lower river coastal model.

<sup>3</sup> - An error was found in the A+ number for Hydro Quebec subsequent to the Study Board report, and has been corrected by experts involved in producing the report charts.