GLAM GREAT LAKES – ST. LAWRENCE RIVER ADAPTIVE MANAGEMENT COMMITTEE

PLAN 2014 EXPEDITIED REVIEW

Phase 1 Overview

How the expedited review began

In February 2020, the International Joint Commission (IJC) ordered an expedited review of Plan 2014, the management plan for Lake Ontario outflows. The review is being done by the IJC's Great Lakes-St. Lawrence River Adaptive Management Committee, known as the GLAM Committee. The first phase of that review was finished in November 2021.

The prime accomplishment

The Phase 1 review study produced an interactive computer-based Decision Support Tool (DST) that will inform decisions on outflows from Lake Ontario in response to extreme conditions. The tool provides a substantial amount of objective information about the real-life impacts of extreme water levels on shoreline properties, recreational boating, commercial shipping, natural ecosystems and other interests on Lake Ontario and the St. Lawrence River.

This tool will be used by the International Lake Ontario – St. Lawrence River Board (Board), which under some circumstances has the authority to override Plan 2014 and direct that more water, or less water, be released from the lake. These actions are referred to as "deviations" from the plan's rules.

In 2017 and 2019, the Board adjusted the outflow through the dams repeatedly to attempt to moderate the impacts to the degree possible. Board decisions dictated the outflow almost half the time from 2017 through 2020. The new Decision Support Tool should help the Board's six members make better-informed decisions in the future.

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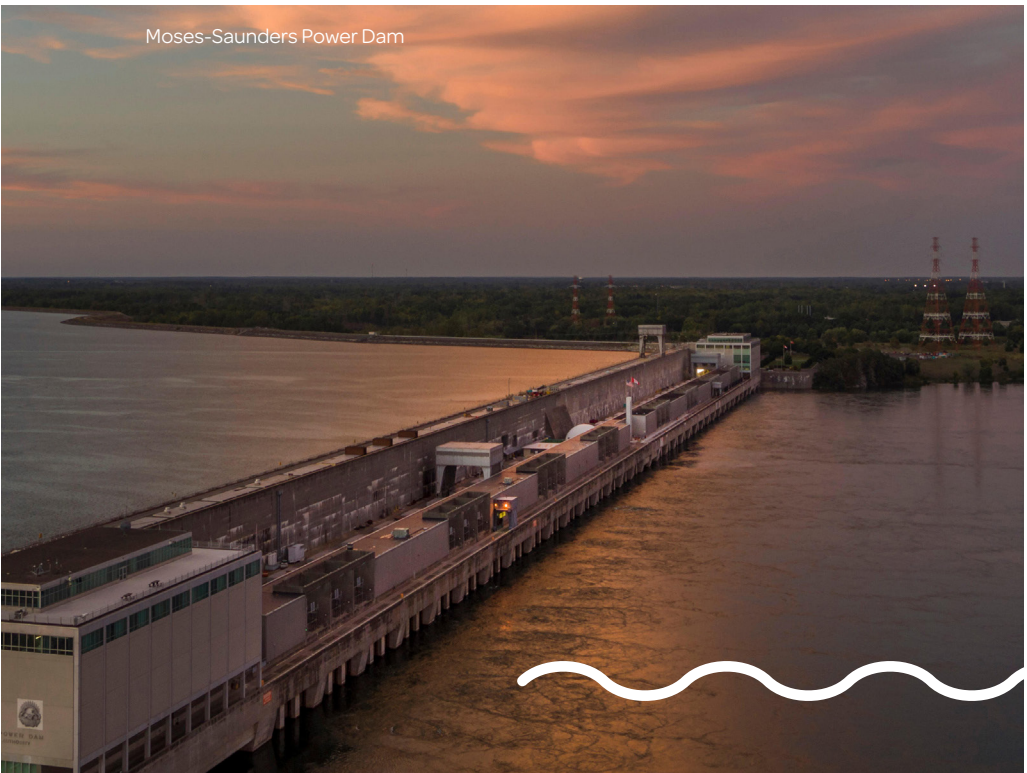
Why deviation decisions under extreme conditions were the focus

The International Lake Ontario - St. Lawrence River Board (Board), appointed by the IJC, oversees the operations of Plan 2014. When the Lake Ontario level reaches certain high or low "trigger points," the Board can choose to adjust the outflow from Lake Ontario differently than regulation Plan 2014 specifies. The outflows are adjusted through the Moses-Saunders Power Dam, a large hydroelectric facility on the St. Lawrence River.

When the Board was managing outflows in real-time under extreme circumstances in 2017, 2019 and early 2020, the Board members were well aware that significant flooding was happening throughout the Lake Ontario-St. Lawrence River system, but they had limited information about the incremental impact on interests that any potential outflow strategies would have both upstream and downstream.

When the IJC decided to order an expedited review of Plan 2014, the Lake Ontario water level remained very high. Levels on Lake Erie and the upper Great Lakes were very high as well. These conditions raised the prospect of continued extreme high water and potentially more flooding of the Lake Ontario and St. Lawrence River shorelines.

The IJC decided that Phase 1 of the review should focus on supporting outflow management decisions that might yield immediate improvements to help provide additional relief if extreme high water did recur. This led to gathering and organizing impact information needed to support possible outflow management decisions by the Board.


Moses-Saunders Power Dam

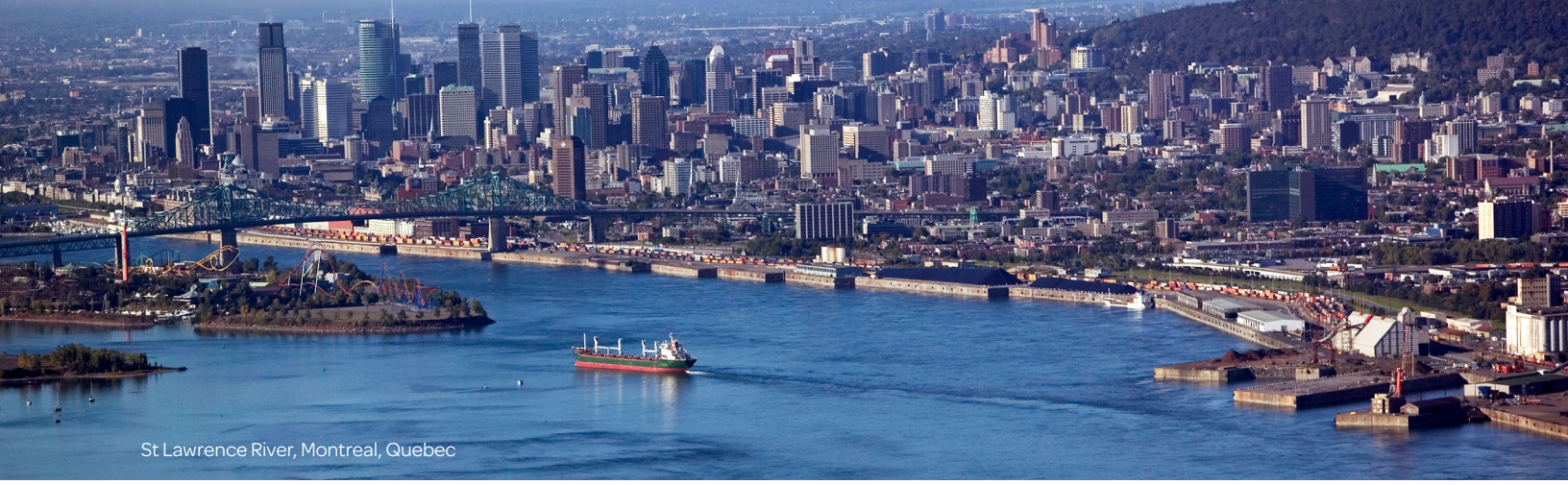
Other significant accomplishments

An investigation identified possible new outflow strategies and yielded nearly a dozen potential changes to the rules that restrain the outflow from Lake Ontario during periods of extreme high water. The possible changes relate to four sets of "limits" that are part of Plan 2014. These will be investigated in detail in Phase 2 of the review.

An 18-member Public Advisory Group (PAG) was established made up of volunteers representing shoreline property owners, local governments, business sectors, environmental advocates and Indigenous communities. Group members communicated directly with the GLAM Committee and with each other and were extremely helpful in creation of the Decision Support Tool. The GLAM Committee recommended that similar public engagement be extended into Phase 2 of the expedited review of Plan 2014.

Collected detailed information about the impacts of high water in 2017, 2019 and early 2020, which has been and will continue to be used in a variety of ways in the future, including in Phase 2 of the expedited review.

Initiated engagement with Indigenous Nations that may be impacted by fluctuating Lake Ontario and St. Lawrence River water levels towards including cultural values, perspectives and knowledge in the adaptive management effort.


St Lawrence River, Montreal, Quebec

How does the Board's new tool help inform deviation decisions?

The Board is responsible for setting outflows to respond to extreme high or low water, however, due to the complexity and limitations of the system, the Board generally is unable to bring about large changes in water levels on Lake Ontario in a short period of time.

As Lake Ontario water levels rise, Plan 2014 automatically increases the outflow from the lake, sometimes greatly. While no regulation plan can eliminate all impacts, the plan aims to the degree possible to balance the impacts of high water levels on various locations and users of the Lake Ontario-St. Lawrence River system.

Board members often are concerned that with high water levels everywhere, any decision they make to deviate from the plan rules to help one use or interest may unfairly harm another. For example, increasing outflows to decrease water levels on Lake Ontario by just an inch (or cm) in a week can cause water levels of the St. Lawrence River near Montreal to rise tenfold that week, and cause levels on the river immediately upstream of the dam (known as Lake St. Lawrence) to *fall* by a similar amount that week.

The new Decision Support Tool will help the Board better understand the impacts associated with these sorts of tradeoffs. The tool presents the Board with a collection of information on the impacts of high water, much of it gathered after the 2017 and 2019 high-water events. This information will show the Board how impacts may change throughout the system if a particular outflow strategy were used and depending on a range of forecast weather-driven inflow conditions.

The lack of reliable long-term forecasts of the weather and of the water supply to Lake Ontario and the St. Lawrence River remains a challenge for the Board. While the tool cannot eliminate this uncertainty, it does allow the Board to explore and better understand this uncertainty with the ability to test and assess outcomes under different possible weather conditions.

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Examples of shoreline impacts in 2017 and 2019

What's next?

With the completion of Phase 1, the transition began to Phase 2 of the expedited review of Plan 2014 . While work on the Decision Support Tool will continue, with metrics on extreme low water among the expected additions, Phase 2 has a much wider focus than Phase 1. It will examine the performance of Plan 2014 in times of extreme high and low water to see if any improvements or additions to the regulation plan may be helpful to provide additional relief.

The analysis will consider how potential plan changes perform across all interests and regions and under a full range of possible future conditions, including those brought about by climate change. Phase 2 is tentatively scheduled to be done by the end of 2024.

How much difference will the tool make?

The Decision Support Tool cannot help the Board "solve" the problem of extreme (high or low) water levels. Opportunities to affect the water level are limited. The amount of water coming into the lake and river depends on the weather and cannot be accurately predicted far enough in advance to prevent extreme high or low levels. The Board's deviation decisions can influence water levels on Lake Ontario in the order of centimeters or inches, not meters or feet — and even then, it must be careful not to do more harm in another part of the system than the good it does on Lake Ontario. The purpose of the tool is to provide the Board with quantitative impact data and display potential outcomes from alternative deviation strategies.

ijc.org/en/glam