

Ripple Effects

Étude internationale sur le lac Ontario - St. Lawrence
International Lake Ontario - St. Lawrence River Study

Étude internationale sur le lac Ontario et le fleuve Saint-Laurent
International Lake Ontario - St. Lawrence River Study

Volume 10, April 2005

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Dear Friend of Lake Ontario and the St. Lawrence River,

It was very good to see all of you this past summer! The input we received from you has been summarized and delivered to the Study Board for consideration. If you were unable to attend and would like to receive a copy of the handouts from the meetings, feel free to contact the communication representative from your country.

The Study Board has met several times with the Plan Formulation and Evaluation Group to further define and refine the Study Guidelines in preparation for their decision-making meeting regarding recommendations this April. They are also holding weekly teleconferences to discuss the issues that have been raised and the research of each of the Technical Work Groups.

Please mark the dates on your calendar now for our meetings this summer. The Public Interest Advisory Group will be facilitating the meetings this year and the Study Board will be presenting. We will be seeking your input regarding our draft recommendations to the International Joint Commission before the Study's final report is written.

Date	U.S.	Canada
Wednesday, June 22, 2005	Massena	Jordan
Thursday, June 23, 2005	Alexandria Bay	Toronto
Thursday, June 30, 2005		Akwesasne
Wednesday, July 13, 2005	Sackets Harbor	Belleville
Thursday, July 14, 2005	Oswego	Gananoque
Wednesday, July 20, 2005	North Rose	Cornwall
Thursday, July 21, 2005	Greece	Montreal
Thursday, July 28, 2005	Olcott	Sorel

Sincerely,



Dan Barletta, D.D.S.
U.S. Lead
Public Interest Advisory Group



Marcel Lussier
Canadian Lead
Public Interest Advisory Group

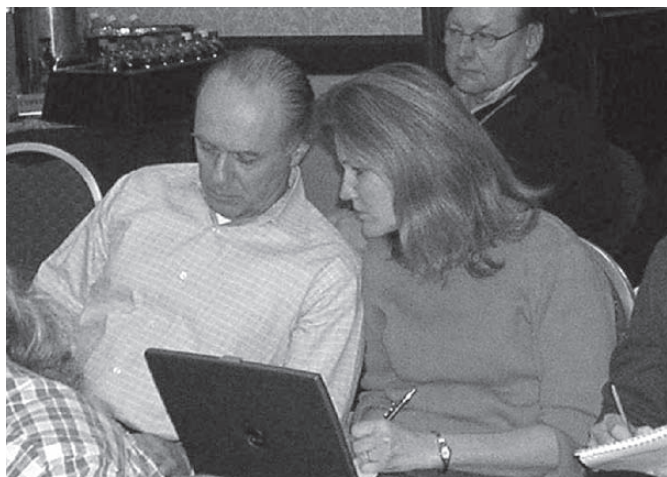
*The International Lake Ontario-St. Lawrence River Study was set in motion in December 2000 by the International Joint Commission to assess and evaluate the Commission's Order of Approval used to regulate outflows from Lake Ontario through the St. Lawrence River. The Study is evaluating the impacts of changing water levels on shoreline communities, domestic and industrial water uses, commercial navigation, hydropower production, the environment, and recreational boating and tourism. The Study will also take into account the forecasted effects of climate change.

The Public Interest Advisory Group is a volunteer group appointed by the International Joint Commission to ensure effective communication between the public and the International Lake Ontario-St. Lawrence River Study Team. This newsletter is published by the Public Interest Advisory Group to help keep you informed about the Study.

Defining the Decision Guidelines

By Wendy Leger and Bill Werick, Plan Formulation and Evaluation Group, Co-Leads

Practice makes perfect. To this end, the Study Board worked through another practice decision workshop along with members of the Public Interest Advisory Group (PIAG) on October 19-20, 2004 in Ottawa, Ontario and January 26 - 27, 2005 in Rochester, New York.



Bill Werick and Wendy Leger, Plan Formulation and Evaluation Group Leads, compare notes during a Study Board meeting in Rochester, NY.

Photo by Arleen Kreusch

During these workshops the Study Board had access to a full range of Performance Indicator (PI) results and could compare plans we have been experimenting with on the basis of both economic and environmental benefits. They were able to examine results from the Shared Vision Model regarding who were winners and who were losers for a number of new plans. The Study Board could see how a plan performed during various high and low water events and was able to investigate the timing of the impacts and results for individual performance indicators. All of this provided them with more information than they ever had access to before. This was not to say that everything was working perfectly. The benefit of using an iterative process and holding practice sessions is that it identifies problems and gaps and provides an opportunity to address them while there is still time.

The Study Board had many questions as they examined graphs and tables from the Shared Vision Model. For example, the Study Board wanted to know more about the relative importance of the impacts to each sector. If they saw a one million dollar average annual benefit, they wondered if this was a big gain, or a relatively small gain to an interest.

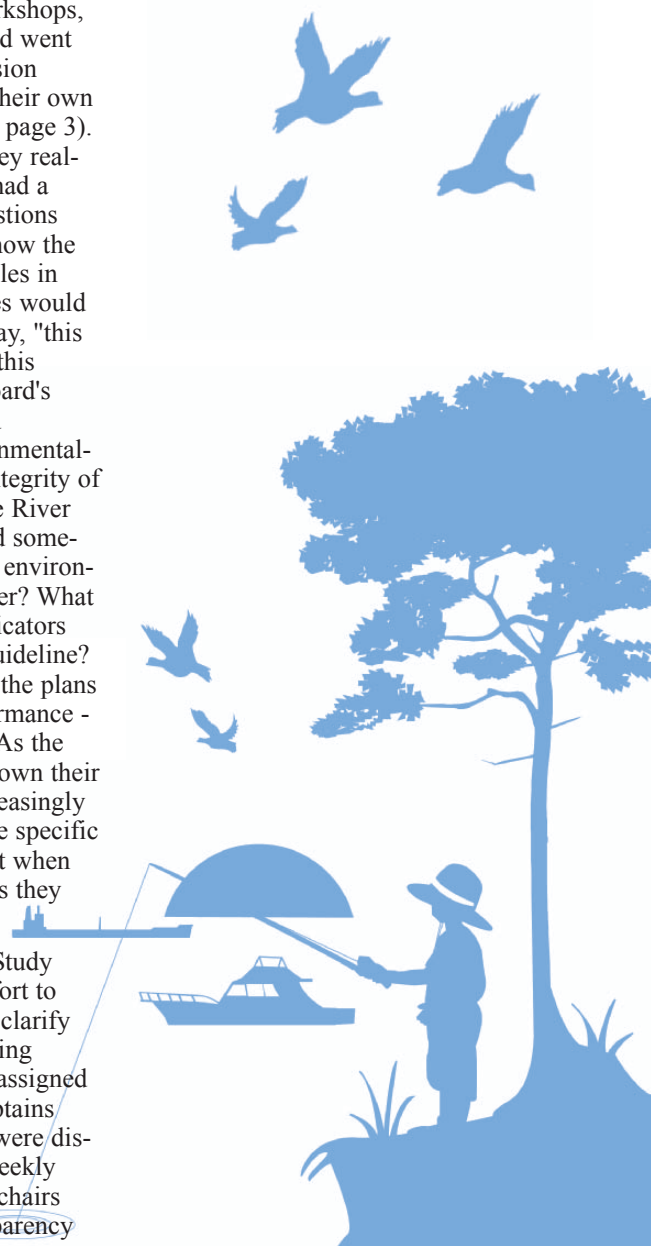
They wondered what the most important environmental performance indicators are - should ducks and frogs be considered equally? Moreover, can all of the performance indicators be trusted? They also wanted to know when the plans worked least well - was it in extreme wet conditions or after long dry spells? The Study Board gave some important feedback to the Plan Formulation and Evaluation Group on some important pieces of information they wanted to see.

During the workshops, the Study Board went through a decision process using their own guidelines (see page 3). As they did, they realized that they had a number of questions about exactly how the general principles in those guidelines would be applied to say, "this

plan is better than that plan for this guideline." For example, the Board's first guideline was "Criteria and Regulation Plans will be environmentally sustainable and respect the integrity of the Lake Ontario - St. Lawrence River System ecosystem." How would someone know if one plan was more environmentally sustainable than another? What environmental performance indicators should they use to assess this guideline? What would the Board do if all the plans had mixed environmental performance - bad for some, good for others? As the Study Board members moved down their list of guidelines it became increasingly apparent they needed to be more specific about what the guidelines meant when using them to select which plans they would send forward to the IJC.

To address these concerns, the Study Board engaged in a rigorous effort to work through each guideline to clarify its definition and its use in ranking plans. One Board member was assigned to "captain" each guideline. Captains developed position papers that were discussed and debated during bi-weekly conference calls. The PIAG co-chairs were the captains for the Transparency Guideline. The result of this process was a more useful set of guidelines that

were put to work in the Study-wide practice workshop held March 23-24 in Montreal, Quebec. The March workshop was the most realistic practice workshop to date in that all of the research behind the performance indicators was complete, all PIs were modeled and verified, viable plans were presented, and the Board had a functional set of guidelines for judging plans. Results from that workshop will be presented in the next addition of *Ripple Effects*, so stay tuned!



Vision, Goal, and Guidelines Defined and Refined

As the Study Board members practiced working through the decision making process with the Plan Formulation and Evaluation Group, the Board realized that their Vision, Goal, and Guidelines needed to be further defined and refined. The Vision, Goal, and Guidelines with expanded definitions below was approved at the Study Board's meeting in January, 2005.

Vision, Goal, and Guidelines

According to the Commission's directive, the Board's mandate is to undertake studies required to provide the Commission with the information it needs to evaluate options for regulating water levels and flows in order to benefit affected interests and the Great Lakes - St. Lawrence River system as a whole in a manner that conforms to the requirements of the Boundary Waters Treaty. The Board is guided by this mandate in pursuing its studies. To meet this mandate, the Board has adopted a vision and goal and developed the following guidelines for its activities as the foundation for providing advice to the Commission.

Vision

To contribute to economic, environmental and social sustainability of the Lake Ontario and St. Lawrence River System.

Goal

To identify flow regulation and criteria that best serve the range of affected interests, are widely accepted by all interests and address climatic conditions in the basin.

Guidelines

1. Criteria and Regulation Plans will contribute to the ecological integrity of the Lake Ontario - St. Lawrence River ecosystem.

This guideline will be measured by the positive or negative movement in environmental PIs to the degree those PIs are significant, certain and sensitive to changes in levels and flow as outlined below.

a. *Significance - the PI must show some key importance to the ecosystem and region*

b. *Certainty - there must be confidence in the results*

c. *Sensitivity - the PI must be affected by changes in levels and flows*

2. Criteria and Regulation Plans will produce a net benefit to the Lake Ontario - St. Lawrence River System and its users and will not result in disproportionate loss to any particular interest or geographic area.

The concept of net benefits applies to both economic and environmental performance indicators. Subject to the constraints imposed by other guidelines, the Board will prefer plans that maximize net economic and environmental benefits overall.

The definition of a disproportionate loss will be assessed qualitatively based on the following information.

a. *Loss means a decline in the average net benefits in the category compared to plan 1958DD with Deviations (1958DD) or a change in the temporal distribution of benefits that stakeholders have said would be harmful even though the average net benefit is positive. If there is no representative PI, the Board may consider some changes in a plan's ability to meet a criterion as a loss.*

b. *Categories can be the six interests represented by the technical working groups, in any of three geographic reaches (Ontario to Ogdensburg, Ogdensburg to the dam, the dam to Lac St. Pierre).*

c. *Losses that reflect a larger percent change from 1958DD are more likely to be considered disproportionate*

The Study Board will treat all the interests equally in its assessment of disproportionate loss (recognizing however, that it would be odd to come back with a plan that is worse for the areas the new plan was meant to improve - specifically the environment, and recreational boating.)

3. Criteria and Regulation Plans will be able to respond to unusual or unexpected conditions affecting the Lake Ontario - St. Lawrence River System.

This guideline will not be used for evaluating and ranking plans. Rather the Study Board will consider carefully the need to allow for deviations under unusual or unexpected conditions and

work towards a clear recommendation on when deviations may be warranted.

4. Mitigation alternatives may be identified to limit damages when considered appropriate.

The Study Board will consider a range of plans that include:

a. *Plans that maximize net benefits, but require mitigation to eliminate disproportionate loss (not to be implemented until the mitigation implementation measures are in place).*

b. *Plans that minimize losses and require little or no mitigation.*

5. Regulation of the Lake Ontario - St. Lawrence River System will be adaptable to the extent possible, to accommodate the potential for changes in water supply as a result of climate change and variability.

The historic and four stochastic time series which represent plausible future conditions will be used in formulating and evaluating plans with the best plans being run through the entire stochastic series. In addition, four climate change scenarios which represent a change or shift in climate will be used in a sensitivity analysis to determine how robust the plans are to climate change conditions.

6. Decision-making with respect to the development of the Lake Ontario - St. Lawrence River System Criteria and Plans will be transparent, involving and considering the full range of interests affected by any decisions with broad stakeholder and public input.

7. Criteria and Regulation Plans will incorporate current knowledge, state-of-the-art technology and the flexibility to adapt to future advances in knowledge, science and technology.



Mohawks at Akwesasne Urge Social/Cultural View of the System

By Greg McGillis, Study Staff

At a unique summer consultation this past year on Cornwall Island, Mohawk residents of Akwesasne called upon the Study Team to pay close attention to cultural and social issues as an integral part of plan formulation and decision-making. Approximately thirty interested participants gathered at the Akwesasne Mohawk School on Cornwall Island, Ontario to discuss the impact that the Study's work on outflows and water levels from the Moses-Saunders Dam could have on local Mohawk residents and their way of life. Canadian International Joint Commission Chair Herb Gray set the stage with comments in the spirit of cooperation and mutual understanding. Elder Ernie Benedict began the evening with a moving invocation and prayer.

The meeting held August 12, 2004 continued with a presentation by Elaine Kennedy on behalf of Study's Public Interest Advisory Group (PIAG). The twenty-five minute presentation was customized to look at the effects on Cornwall Island from similar presentations delivered throughout the system that summer.

Following the presentation, PIAG member Marc Hudon led an entertaining, informal and wide-ranging discussion between local residents and the Study Team members present, including Doug Cuthbert and Eugene Stakhiv, the Canadian and U.S. Study Co-Directors.

A constant concern was that, for all its impressive array of science and information, the Study Team must take into account social and cultural factors when making decisions about the St. Lawrence River upon which so many of them depend. Winter ice cover is an important resource for fishing, ice-roads and protection of shorelines and ice advisories would be useful. Medicinal plants should not be endangered.

Among the more recent developments, Mohawk participants said that the then-recent calcium chloride spill near Gananoque had highlighted the impor-

tance of respect for the way of life and viewpoints of Akwesasne residents. For example, local Mohawks expressed surprise that they were not advised about the chemical spill upstream that could have affected them.

Study representatives indicated that communications with all affected interests on possible plans and criteria were a priority going into the final year of the Study.



Doug Cuthbert, Study Canadian Director; Ernie Benedict, Akwesasne Elder; and Gene Stakhiv, Study U.S. Director, gather for a picture after the Cornwall Island meeting.

Photo by Greg McGillis



Mohawk Council of Akwesasne Grand Chief Angie Barnes with RT. Hon. Herb Gray, Chairman of the IJC Canadian Section during our public meeting on Cornwall Island last summer.

Photo by Greg McGillis



Lloyd Benedict explains how water level fluctuations impacted his fishery.

Photo by Arleen Kreuzsch

2004 Summer Meetings

By Arleen Kreusch, Study Staff

Over 400 people throughout the Lake Ontario - St. Lawrence River basin provided us with input this past summer through a series of fifteen meetings. Our first meeting was held on Cornwall Island with the Akwesasne Nation (see article page on 4). Meetings were held simultaneously in the United States and Canada pairing Massena, NY, with Jordan, Ontario; Alexandria Bay, NY, with Toronto, Ontario; Henderson, NY, with Belleville, Ontario; Oswego, NY, with Gananoque, Ontario; North Rose, NY, with Cornwall, Ontario; Greece, NY, with Dorval, Quebec; and Olcott, NY, with Trois-Rivières, Quebec by telephone conference call for the question and answer session.

An open house provided information regarding the Study and its nine technical work groups through a panel display. The presentation was tailored for each location and included information from the technical work groups that represent the main interests: Coastal Processes; Commercial Navigation; Environmental; Domestic, Municipal, and Industrial Water Uses; Hydroelectric Power; and Recreational Boating and Tourism. Handouts listing the preliminary performance indicators, the preliminary criteria and metrics, and the Study Board's guidelines were available. All of this information is available on the Study website at www.losl.org.

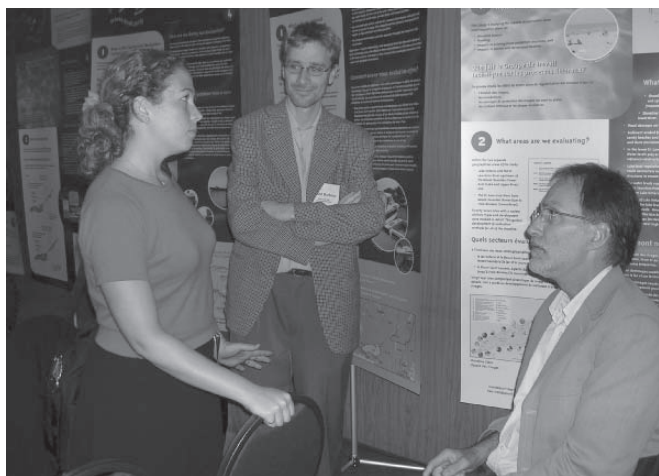
The shared vision process being used by the Study Board to evaluate plans and make recommendations was described during the presentation. The draft criteria, metrics and performance indicators were also highlighted. At each meeting the PIAG explained that performance indicators are measures of economic, social, and environmental impacts; criteria are water level guidelines, which give general direction to the regulation process - they are the water levels people prefer or want to avoid; and metrics are specific maximum or minimum flows or water levels that satisfy the criteria.

Transcripts from the meetings are available on the Study website. The Study Board reviewed the information we received from those that attended. Answers to a sampling of the questions from the meetings are included in the article on Page 6. For a complete set of questions and answers, please visit the Study website. If you do not have access to the web and would like to request a copy of either the handouts or a meeting transcript, please contact the communication representative in your country. We look forward to talking with you again this summer!



Canadian PIAG member, Elaine Kennedy, and U.S. PIAG Co-lead, Dan Barletta add finishing touches to the script for the first meeting of the summer with the Akwesasne Nation on Cornwall Island.

Photo by Arleen Kreusch



Annie Carrière, contractor for the Water Uses TWG, discusses the impacts of the climate change scenarios with Benoît Barbeau and Luc Bergeron from Zip Ville-Marie during the 2004 Montreal, Quebec, meeting.

Photo by Greg McGillis



Scott Tripoli explains the impacts of water levels on erosion during the 2004 Oswego, New York, meeting.

Photo by Aaron Smith

Summer 2004 Meeting Questions and Responses

By The Study Team

The questions and responses in the next several pages were compiled through review of the transcripts from our 2004 summer meetings. Due to space constraints this is a condensed list. If you would like to review a complete set of questions and answers, please visit the Study website at www.losl.org. If you do not have access to the web, or have additional questions, please contact the communication representative in your country (contact information listed on page 11).

Study Board

How are you going to ensure that the information you develop in the Study gets to the people that are affected?

We will ensure that final results and information generated by the Study are placed on the Study website and are available in hardcopy form to anyone who requests a copy. We have been and will continue to let people know that information is available through our newsletter, media relations and at our public meetings and workshops.

Social and cultural views of the River are important both to Aboriginal peoples and others. Can you take those factors into account in your Study?

Several meetings have taken place with First Nations to assure that their specific concerns about social and cultural factors are considered.

Why are you including the Upper River with the Lake? The Upper River area has different problems than the Lake. Why are they included together?

Although they are discussed together, the more detailed evaluations consider them separately. We have reviewed our work on the Upper River with several experts in the area and have had very positive feedback on the work that has been done.

What is your ability to regulate the Lake? How much control do you have?

We cannot completely control the level of the Lake since we can only control what goes out, not what comes in. The revised plan will attempt to manage the levels given revised acceptable outflows and estimates of possible inflows. We can't stop the very highs and we can't stop the very lows, but we can offset them a little with a robust plan. We want to avoid damage, but there is no way to keep the Lake or the River permanently at optimum levels, given the various water supply scenarios that naturally occur in the basin. Particularly during sustained wet or dry periods, our ability to regulate to the satisfaction of all stakeholders is extremely limited.

What are you doing about abrupt changes? We want stability in the system.

This is a dynamic system. It is not always possible to maintain a stable water level. Our objective is to produce regulation options that minimize abrupt changes caused by Mother Nature, minimize abrupt flows and meet the needs of the various interests.

Why can't more controls be put on the system to regulate it better?

Additional dams or control structures are not included in the mandate given to the Study by the International Joint Commission. Such structural changes are specifically not in the scope of the Study. In any case, additional structures might only complicate the regulation of an already complex system and governments would not approve such a structure because of the potential disruption and damage to the system..

Do any interests have priority over other interests?

The intent of the Board is to provide net benefits to the affected interests without creating disproportionate harm to any one interest. Keep in mind that to gain improvements some tradeoffs might be necessary between the interests.

What will the end result of the Study look like? How will it work?

The purpose of the Study is to formulate revised regulation plan options and criteria. Options are being developed and they will be the end result of the Study. The workings of the plan will be developed once the International Joint Commission selects an option.

Is no loss to any faction an attainable goal?

At any one point you may have a loss. The idea is to reduce the losses and gain as many benefits as possible. It's a complicated issue, but there are many more interests being studied now than ever before. At this time, the scientists and engineers involved with the Study believe that a new plan can be developed that will be better for all stakeholders.

We must consider lowering the water more in the winter so that when spring rain occurs we are not in a delicately high water situation already. Comments?

We have the research and information to model this idea and will do so. There will be a price to pay for the benefits of drawing the Lake down. The model will help to determine the tradeoffs that will be required and we will have to assess how much draw-down is reasonable in light of all interests. Winter drawdown is important in terms of fish production. Sometimes when winter ice forms at the wrong levees, there is a larger fish kill. In 1964 and 1965 large numbers of fish were found dead due to water levels.

Coastal Processes Technical Work Group

What effects do storm surges have on the lakes?

Wind driven events can cause the lake levels to rise rapidly in one or more areas of the system. These are most common in the late fall and are factored into the Study's flood and erosion prediction system models.

Regarding erosion in the Eastern Lake Ontario area, why have things been so bad with water levels since the 1930s?

Eastern Lake Ontario is a complex area. The supply of water into Lake Ontario has been much greater than in the early part of the 20th century. The eastern portion of Lake Ontario has therefore suffered more due to greater supply coming into the lake in comparison to the 1930s when the beaches were very wide. Shore protection also has a negative impact to the natural process of beach formation so it adds a dynamic complication.

We have built 100 feet back on the property but since the 1940s the shoreline continues to erode. Comments?

This is not uncommon. Erosion is a natural process around the perimeter of the Great Lakes. It is not good news but it is not due to the control of water levels. It

would be useful to look at the history of Lake levels. You built during very low Lake levels. Over the past 50 years we have entered into an era of larger amounts of water coming into the Lake system, noticeable since the 1950s. Levels are a function of natural processes. Levels would have been even higher without any control at all. Erosion will continue naturally and the only question is whether we can slow it down a little with water regulation regimes.

What has the Study reported about winter? What is the erosion impact of ice coupled with wave action?

Ice cover during the winter can actually reduce wave action and thereby reduce erosion. However as temperatures increase in the spring, chunks of ice can increase the amount of scouring that occurs during wave action. This process is complex and the Study's modelers are attempting to formulate new ideas of how to regulate the water levels during the winter to benefit property owners.

Where is the economic value due to loss of property value to the shoreline property owner when levels are low?

Erosion occurs at all lake levels but is generally accelerated during higher lake levels. It is therefore possible that a property could lose value during low water periods especially if a home was located very close to the shoreline. The Study evaluated the cost and time at which shoreline protection would be required at a given parcel. Regulation plans with lower water levels defer the need for shore protection whereas those plans with higher water levels accelerate the need for shore protection.

What about the economic value contributed by the shoreline property owners? Why isn't there a performance indicator regarding the taxes property owners pay and the economic value we add to the region?

The economic value of shoreline property owners to a region and the property taxes they pay is well beyond the scope of this study. The economics of the study are based on a comparison of alternative regulation plans and the economic impact of each plan with respect to each other.

How many places have been put off of the tax rolls because of erosion?

We could consider taxes, but we've been focusing more on direct expenses. We focus on measurable economic data to compare plans, not completely quantify every dollar spent. We are looking at compromise and trying to balance

between all interests. This information was not collected. Regardless of the regulation plan selected, it will not bring back any properties already lost because of erosion, so information on lost properties would not help in plan selection. We focused on measuring the future economic impacts to existing properties, which could be impacted by changes to the regulation plan.

As a property owner on the eastern shore of Lake Ontario, spring erosion is my biggest concern. Riprap is ineffective. Why can't something be done in anticipation of high waters in April caused by storms? Why can't we drop levels in the winter?

To answer the first part of your question a well designed and constructed riprap structure is generally the most preferred method of shore protection due to its effectiveness and affordability. If you have experience with an ineffective riprap structure it is likely due to it being improperly designed, constructed or maintained. The second part of your question pertains to the ability to control winter water levels in anticipation of high spring levels. The problem with dropping the winter lake level too low is that it may not recover in the spring and summer thereby having a major impact on lake and river interest groups that rely on adequate water levels during the spring through fall period. Furthermore, the system simply cannot be operated in a manner that would change water levels in a way that would prevent damages from storms and unforeseen meteorological events. However as part of the study we will be making recommendations that allow for quicker operational changes to the system based on improved weather forecasting.

Is the money I've spent protecting my property being included in your studies?

Yes, it is factored in as part of the economic models. One aspect being considered in the evaluation of regulation plans is the impact they will have on the need and cost to strengthen or repair/replace existing protection. For example, if a proposed plan led to a greater frequency of high water levels during stormy seasons, damage to shore protection would be accelerated and the protection would need to be replaced more frequently, with an economic cost.

Commercial Navigation Technical Work Group

Why is there a need for higher water levels potentially towards the end of the year for commercial shipping?

Water levels typically have a seasonal variation to them. In general, Lake Ontario levels tend to rise from around January to June and then Fall, depending on basin water supplies, from June to December. During this Fall season, there is a major movement of grain through the system for export to Europe. Also during this time, vessels are making their last trips through the system before the Seaway closes for the season in December. Requests for higher levels, usually downriver, occur infrequently and are normally for short periods of time. These requests are usually made when the actual supplies are short of the anticipated or forecasted supplies.

Is the water kept high strictly because of shipping?

Lake Ontario levels are not made high for shipping interests. If levels are high, it is a result of high supplies into the Lake or restrictions on outflows due to downstream conditions. In the past 50 years, supplies have generally been high. However, the water levels are lower under the current regulation plan than they would be without the plan.

What is the economic justification for shipping west of Montreal?

Shipping is an inexpensive mode of transportation when compared to alternative modes such as truck and often rail. Ships move such bulk commodities as grain, iron ore, petroleum products, manufactured iron and steel and coal through the Seaway system to a wide range of Canadian and U.S. ports located throughout the Great Lakes. In 2004 for instance, over 2,600 commercial transits were recorded, transporting over 30 million tons of cargo.

Environmental Technical Work Group

How do you rank the importance of the environment?

The Study ranks the importance of the environment equally with other interests.

What is going to be the arbitration method for ranking and placing priority on the environment?

Our integrated ecological response model has been incorporated into the Shared Vision Model. The Study Board has a guideline that identifies the need

Continued on next page

www.iosl.org

for any recommendations to respect the ecological integrity of the Lake and River ecosystem.

How do we bring environmental protection and natural systems to the forefront?

Environmental interests and concerns are being evaluated as a key part of the Study. Plan 1958-D did not take the environment into consideration.

Why didn't the Environmental Technical Work Group investigate the environment in the upper section of the St. Lawrence River?

The upper section of the St. Lawrence was studied and is included in the more detailed analysis, although the area has been grouped together for some purposes with Lake Ontario. Three PIs have been identified for this section of the river (northern pike, Virginia rail and muskrats), and the metrics by which they are evaluated were determined to be similar to the metrics in other parts of the Study area.

What are the impacts of water levels on wetlands?

Plant diversity and abundance depend on the frequency with which a particular wetland area is either drowned or left dry. Periodic high and low water levels are generally good for wetlands. There is also a secondary impact, in terms of faunal species that inhabit wetlands. For example, our investigations indicate that wetland sustainability is greatly affected by the abundance of muskrat in the wetland. If we can develop recommendations that will result in water levels that increase the muskrat population, we will be able to help the wetlands.

What is the linkage between water levels, their impact on the environment, and groundwater?

This issue has been considered, but the relation to ground water and lake levels is minimal. Based on an examination of data on the water supply and outflows, it has been determined that ground water probably plays a minor role in the overall water balance.

Are any of your studies related to a cleaner Lake?

We only look at the environmental issues that have a relation to water levels. While water pollution is a major issue, it is not addressed in this Study because it is not affected by water levels.

Why have you not converted environmental indicators to economic values?

It is very difficult to put a dollar figure

on an environmental indicator since dollars cannot replace, say, a lost species. The Environmental TWG has used an Integrated Ecological Response Model to determine the impact of levels on environmental factors.

Hydroelectric Power Technical Work Group

Can large variations caused by peaking and ponding near the dam be reduced or controlled?

Peaking and ponding is an operational aspect of any plan option. The Study is not investigating this aspect of operations.

Could the power companies not install more hydro generators allowing greater outflow as alternatives to holding water back?

There are no plans to modify the existing control structures, and that is not within the scope of the Study.

Hydrologic and Hydraulic Technical Work Group

What are you doing about forecasting? If we know levels are going to be high, why can't we lower the water in anticipation? Why can't water just be let out the St. Lawrence River when there are problems with high supplies?

The current regulation plan doesn't have any forecasting components. Now we have developed forecasting technology, and our new recommendations will include the use of a forecasting component. But the accuracy of forecasting future conditions is imperfect and risks of releasing or storing water will continue to be carefully considered in balancing the needs of all interests. Water cannot be let out of the Lake when there are high supplies without considering the impacts to the River.

In some months we have a lot of rain. Holdback caused higher levels and made things worse. Why do we hold water back?

When large volumes of rain fall, any plan will do its best to release some of that rain. Under most plans, some water is held back in case the opposite happens and supplies reduce substantially. It's usually easier to let water go than to hold back water you don't have. The various interests have different views on higher water: riparians don't like it in some months, recreational boaters like it in some months. Any plan will try to reduce the extremes for all affected

interests and achieve a compromise between conflicting interests in a very complex system.

This year we have had a very mild summer with a lot of rain. In August the St. Lawrence dropped over eight inches. Why?

Seasonal decline in the Fall is normal. Levels peak in June and decline in the fall. The decline has begun through diminishing supplies and evaporation. Although July 2004 experienced record rainfall, we are now on the natural curve. With a lot of rain in July more water was released to return to average levels as much as possible, but the increase in flows was not noticed due to high supplies. Although levels were down by eight inches, the average is usually more than that. No operational changes will occur until the new plans are in place.

Where and how are water levels measured?

There are six major gauges around the Lake. At each location, a shallow well is built near the shore with a pipe connected underwater to the Lake. The level of water in the well is the same level as the Lake. The levels of the six gauges located at Oswego, Kingston, Port Weller, Cobourg, Rochester, and Toronto are then averaged. There are also a number of gauges along both shores of the River.

How does climate change affect long-term water levels?

The Study is considering four possible cases - some of which result in higher levels, others result in lower levels - reflecting the uncertainty regarding climate change.

How much can you raise or lower the Lake, in practical terms? With control structures in place how much does man alter the four-foot range? Do we control the entire four-foot range or only the extremes?

The natural range from the highest high to the lowest low on Lake Ontario was over seven feet prior to regulation. Regulation has reduced the range to closer to six feet with a target range of four feet, which the plan and the Board achieves most of the time.

Please explain how having the dam has lowered levels.

The River was dredged to provide a channel for ships as part of the power dam project. Other changes also increased the volume that the River could hold. Releases can, therefore, result in more water leaving the Lake

than would have without the dredging. The Moses-Saunders power dam controls the outflows from Lake Ontario, so depending on supplies, outflows can be increased to lower levels.

Why are Lake levels so much higher than, say, in 1972 when there was so much more beachfront and better clearance for boating?

Lake levels vary every year, and in any year levels may or may not be higher than in 1972. Beachfronts and boating clearances change as a result of the levels occurring at the time. The last thirty years have, in fact, seen fairly high levels with much higher supply into Lake Ontario than before. Variation from year to year will always occur.

What is the difference between the 100-year average and the average over the past 40 years? The constant reference to the 100-year average is confusing and doesn't give the answer that should be given. Shouldn't we be looking at the 40-year average?

These long-term levels are natural changes and may happen. The 100-year average is the most reliable record of historic conditions. The 40-year average, often referred to, relates to the period during which the current control structures have been in place. Both periods are important.

Information Management Technical Work Group

Are your presentations and other documents made available on the website?

Wherever possible, they are. If there is a specific document that you need or would like to see, you can e-mail or call the communication representative in your country and they will provide the information if it is available.

Plan Formulation and Evaluation Group

Can a new plan address issues of reliability and predictability? Can water levels be more consistent?

The Plan Formulation and Evaluation Group is looking at reliability and predictability as it considers plan options.

Under the new plan could the Control Board make more frequent decisions and somehow achieve greater accuracy in their forecasts and releases?

The recommended plan may include more frequent outflow changes than the present weekly decisions. However, mak-

ing decisions in response to short-term events may have long-term consequences that we are unaware of.

How have you factored politics into the regulation plan options presented to the public?

We are not factoring politics into regulation decisions. The Study is focusing on meeting the needs of all interests as best we can and adhering to our guidelines and mandate from the International Joint Commission.

Is monitoring the rainfall in the upper lakes included in a portion of the Shared Vision Model?

The Shared Vision Model is a tool used to evaluate regulation plan options by modeling the various aspects of the system in a way that is agreed upon by the Study Team. The selected option may include a forecast procedure that would be based on future supplies, such as rainfall, on the upper lakes.

Recreational Boating Technical Work Group

Can the levels be held higher for a longer period of time during boating season?

There is a gradual natural decrease in levels following the peak. The current plan stops that a little, but natural processes dictate. In many cases, the decline happens too rapidly and causes problems. A new plan could modify this decline in levels. The Study is trying to come up with something that will be an improvement over the existing plan.

September 1st seems to be the magic date for a dramatic drop each year. Since power stations east of Cornwall do not have the capacity to hold water back, water is released down the system. Why can't surplus water be let out slower over a longer period of time? This would benefit recreational interests and should not provide any negative impact. Is an easy drop of the system possible?

Levels follow a natural cycle. During the spring more comes in. The peak is normally seen during late June, and then the supply goes down during the summer and fall months. Even without the dam the Lake would follow seasonal highs and lows with the lowest point in December. One problem with holding back the water is where to keep it. At the shoreline of Lake St. Frances, flooding would be a real problem. Lake St. Frances is not as big as Lake Ontario so fluctuation of water levels is much more

restricted, the fluctuations can be dramatic and the effects on residents more significant as a result. We try to stabilize levels there because there is no place to store the water. A more gradual drop of lake levels will be modeled and the results will be presented at the summer public meetings.

Can more be done to meet the short-term needs of boaters to get out of the water at the end of the season?

The plan formulators are looking at options that can slow the decline of water levels after the levels peak in the summer.

If a marina is poorly placed, why is that our problem?

We've included marinas and recreational boating as one of the interests and an area for study. We could ask the same thing about other economic interests such as shoreline owners who locate in floodplains or build too close to eroding shoreline, or municipal water intakes that are too shallow. Where possible, planners have tried to provide plans with some improvement to all interests, but poorly placed facilities still always face the risk of either very high or very low supplies and no plan will entirely avoid those problems. The marinas are there and the impact of water levels on those marinas is real so we have taken them into account in our economic models.

If you would like to review a complete set of questions and answers, please visit the Study website at www.losl.org

Performance Indicator Suggestions and Responses

Based on responses provided by the Study Team. Compiled by: Arleen Kreuzsch, Study Staff

Two summers ago we sought your input regarding draft performance indicators for each of the Technical Work Groups and the Study Board. Responses to most of the suggestions we received were outlined in Volume 9 of Ripple Effects. This article summarizes the responses to the suggestions we received for the Hydrology and Hydraulics Technical Work Group (TWG), the suggestions received from Canada for the Recreational Boating and Tourism TWG, and the Study Board. Actual suggestions and responses were included as an appendix to the PIAG Report for Study Years Two and Three. To request a copy of the report, any of the appendices, or the final performance indicators, please contact the communication representative in your country.

Hydrology and Hydraulics

Suggestions to this group were made regarding levels, flows and frazil ice. The amount of water entering and leaving the Lake will be tracked in the simulations of draft regulation plans. In making comparisons of Lake levels for different periods one must take into consideration the differing amounts of water entering Lake Ontario from its local basin as well as from Lake Erie in the different periods. Flows from Lake Ontario are varied in the winter to manage the build-up of frazil ice, which if left unchecked, can cause a restriction in the outflow of the River for much of the winter. It is recognized that any regulation plan that is recommended must contain the flexibility to vary flows in the winter to manage ice formation in the upper St. Lawrence River.

Recreational Boating and Tourism

The Study received performance indicator suggestions for the Recreational Boating and Tourism Group that included the number of boats in operation from one year to the next, and damages to boats. The Recreational Boating and Tourism Technical Work Group was

charged with developing performance indicators that would show effects of changing water levels on recreational boating and tourism interests, and ideal criteria for water levels that would best meet the needs of recreational boaters and associated businesses. An inventory of all marinas, yacht clubs and state, provincial or privately run boat launch ramps was conducted during the summer of 2002. Personal interviews inventoried services provided at each marina and yacht club. Operators were asked about impacts to their business from both high and low water conditions and mitigation measures used. Recreational boating impacts were evaluated considering boaters' daily expenditures and their willingness to pay beyond those expenditures along with the indirect impact on the local economy. In addition to recreational boaters that use Lake Ontario or the St. Lawrence River through marinas and yacht clubs, private docks and launch ramps, charter and tour boats have also been evaluated and included in our analysis.

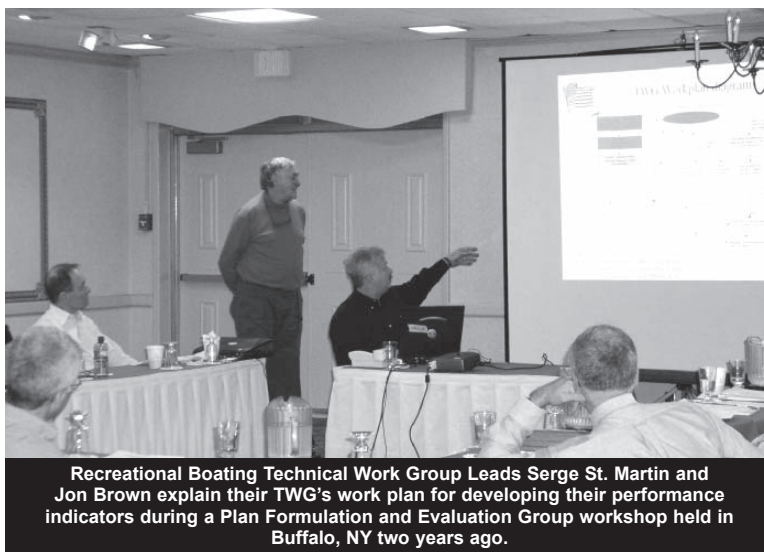


Photo by Arleen Kreuzsch

Recreational Boating Technical Work Group Leads Serge St. Martin and Jon Brown explain their TWG's work plan for developing their performance indicators during a Plan Formulation and Evaluation Group workshop held in Buffalo, NY two years ago.

This group was also asked if it evaluated information about commercial fishing activities. Commercial fishing has not been included in the Study because the commercial fishing industry is negligible in Lake Ontario.

Study Board

The Board received a suggestion to look at the performance indicators over time: short, medium and long-term and plan for a regular reconfiguration of the

criteria. It was also suggested that the criteria must be able to adapt. For their final report to the Commission, the Study Board will consider, discuss and address options and alternatives for regulation criteria and plan review, updating and adaptability in order to effectively address evolving conditions in future decades.

The Board was also asked to consider indigenous cultural needs. The Study Board is very cognizant of the need to identify and address Native and Tribal concerns. For this reason two representatives of the Mohawk community were appointed by the IJC as members of the Study Board; a number of meetings have been held to date over the course of the Study with representatives of the Akwesasne and Kahnawake communities on the St. Lawrence River and more are scheduled; concerns have been documented (see article on page 4) and several related environmental studies have been undertaken including a significant contract let to the Akwesasne Task Force on the Environment to identify and communicate Mohawk concerns.

Lifestyle was suggested as a performance indicator. This socio-cultural impact is recognized by the Study Team, but is difficult to evaluate. It can be a function of many facets of changing times. The many other qualitative aspects of social well-being that were raised at public meetings have been considered throughout the study.



Al Will, Public Interest Advisory Group, Hamilton, Ontario

Photo - Arleen Kreusch

PIAG Speakers Bureau

The Public Interest Advisory Group membership would like to meet with you. A representative in your area can give a presentation about the Study to your group, no matter the size. Please contact the communications staff listed at the end of this newsletter to request a presentation.

United States

Dan Barletta, D.D.S. - Rochester, NY
Thomas McAuslan - Oswego, NY
Tony McKenna - West Amherst, NY
Jon Montan - Canton, NY
Carol Simpson - Massena, NY
Henry Stewart - Rochester, NY
Max Streibel - Rochester, NY
Paul Thiebeau - Clayton, NY
Scott Tripoli - Mannsville, NY
Stephanie Weiss - Clayton, NY

Canada

Marcel Lussier - Montréal, PQ
Larry Field - Toronto, ON
Michel Gagné - Montréal, PQ
John Hall - Burlington, ON
Marc Hudon - Trois-Rivières, PQ
Elaine Kennedy - Cornwall, ON
Captain Ivan Lantz - Montréal, PQ
Sandra Lawn - Prescott, ON
Paul Webb - Brockville, ON
Al Will - Hamilton, ON



Jon Montan, Public Interest Advisory Group, Canton, New York.

Photo - Arleen Kreusch



Larry Field, Public Interest Advisory Group, Toronto, Ontario

Photo - Arleen Kreusch

Contacting Us

If you are interested in sharing your concerns about water levels in Lake Ontario and the St. Lawrence River, would like to receive more information about the Study, or would like to participate in one of our meetings, please contact the communication representative in your country.

United States

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Visit the Study website at www.losl.org !

2004 Study Announcements

Arrivals

Greg McGillis is welcomed as the new Public Information Officer in the Canadian Secretariat. He joins the Study from a career in politics and education. Greg has extensive writing experience, having won awards for his writing and publications in his previous work for the Ontario Secondary School Teachers' Federation.

Carol Simpson recently became a new U.S. Public Interest Advisory Group member. Carol is currently the Senior Community Relations Representative for the New York Power Authority, St. Lawrence-FDR Power Project in Massena, NY. She has lived along the St. Lawrence River all of her life and understands the economic impact to the area as a result of the River; the importance of the environmental state of the River and surrounding area; and the aesthetic

nature and beauty the River offers. Carol looks forward to partnering with those who are actively working to not only sustain but enhance the River's important qualities.

Dr. Jeffrey Watson joined the Study in July as the new co-lead of the Environmental Technical Working Group. Bringing over 35 years of experience in research and management of natural resources and environmental issues to the Study, Dr. Watson has worked as a scientist and a senior manager in the public, private and NGO sectors. He has authored a wide array of papers on water issues and the environment and is a noted expert on the link between science, public policy and public communications.

Congratulations to:

Our congratulations go to PIAG member, Henry S. Stewart. Henry was sworn in as a member of the Bar of the Supreme Court of the United States on June 21, 2004. The admission ceremony was held in the United States Supreme Court Chamber and was presided over by eight of the nine Justices of the court, including Chief Justice William H. Rehnquist.



Featured in our Next Issue

Study's draft candidate plans
Final summer meeting locations

**International Joint Commission
Canadian Secretariat Study Office
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Ottawa, ON, K1P 6K6**



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