Appendix A

International Lake Ontario-St. Lawrence River Study

Public Interest Advisory Group Membership and Affiliations

PIAG Member	Affiliations
Dan Barletta Rochester, NY, U.S.	Member of Study Board Grandview Beach Association South Shore Advisory Committee Lake Ontario Levels Oversight
Larry Field Downsview, ON, Canada	Liaison to Coastal Processes TWG Toronto & Region Conservation Authority
Paul Finnegan Albany, NY, U.S.	Liaison to Hydroelectric Power TWG Liaison to Hydrologic & Hydraulic TWG New York Power Authority
Michel Gagné Montreal, QC, Canada	Liaison to Domestic, Industrial and Municipal Water Uses TWG
John Hall Burlington, ON, Canada	Liaison to Environmental TWG Liaison to Information Management TWG Hamilton Harbour Remedial Action Plan
Marc Hudon Chicoutimi, QC, Canada	Liaison to Environmental TWG Liaison to Coastal Processes TWG Liaison to Commercial Navigation TWG Union Québécoise pour la Conservation de la Nature (UQCN)
Elaine Kennedy St. Andrews, ON, Canada	Liaison to Environmental TWG Liaison to Hydrologic & Hydraulic TWG Cornwall and District Environment Committee
Anjuna Langevin Rimouski, QC, Canada	Liaison to Commercial Navigation TWG
Sandra Lawn Prescott, ON, Canada	Liaison to Environmental TWG Liaison to Recreational Boating TWG
Marcel Lussier Bossard, QC, Canada	Member of the Study Board Liaison to Hydroelectric Power TWG. Liaison to Domestic, Industrial and Municipal Water Uses TWG
Thomas H. McAuslin Oswego, NY, U.S.	Liaison to Commercial Navigation TWG Liaison to Recreation Boating TWG Port of Oswego

PIAG Member	Affiliations
Anthony McKenna West Amherst, NY, U.S.	Liaison to Coastal Processes TWG New York Great Lakes Basin Advisory Council Executive Committee, Niagara USA Chamber of Commerce Board of Directors, Buffalo Niagara Partnership
Jon Montan Canton, NY, U.S.	Liaison to Recreation Boating TWG
Henry S. Stewart Rochester, NY, U.S.	Liaison to Coastal Processes TWG Lake Ontario South Shore Council International Great Lakes Coalition South Shore Advisory Committee
Max K. Streibel Greece, NY	Liaison to Coastal Processes TWG Rochester Harbor Town Planning/Advisory Committee South Shore Collaborative
Paul A. Thiebeau, Jr. Clayton, NY	International Water Levels Coalition
Scott D. Tripoli Mannsville, NY	Liaison to Commercial Navigation TWG Liaison to Hydrologic & Hydraulic TWG Liaison to Plan Formulation and Evaluation TWG
Paul Webb Iroquois, ON, Canada	Liaison to Recreation Boating TWG International Water Levels Coalition
Stephanie Weiss Clayton, NY, U.S.	Liaison to Environmental TWG Save the River
Al Will Hamilton, ON, Canada	Liaison to Recreation Boating TWG Ontario Sailing Association

Appendix B

International Lake Ontario-St. Lawrence River Study

Outreach Meetings

April 1, 2002 – March 31, 2004

One of the goals of the Study is to ensure an effective two-way communication with the public. To this end, the Public Interest Advisory Group has a speakers' bureau that is willing to meet with interested groups, no matter the size, to discuss the Study and the concerns of the public. Furthermore, the Technical Work Groups and Study Board members also have opportunities to speak at meetings of interested groups. The table below lists the many meetings that have taken place between April 2002 and March 2004 where Study activities were presented to the public, and where public concerns were heard.

Audience - Organization	Location	Date	Approx. No. of Attendees
Outlook Club	Sandy Creek, NY	May 28, 2002	11
Grand View Beach Association	Greece, NY	May, 2002	100
Resource Stewardship Council S.D.&G.	Chesterville, Ont.	June 27, 2002	12
South Stormont Planning Advisory Committee	Osnabruck Centre, Ont.	July 9, 2002	7
Ault Island Community Association	Ault Island, Ont.	July 20, 2002	25
Friends of Sandy Pond Beach	Sandy Creek, NY	July 25, 2002	7
Integrated Transboundary Water Management Conference 2002	Traverse City, MI	July 2002	5
PIAG Round Table Meeting	Sackets Harbor, NY	Aug. 8, 2002	17
PIAG Public Meeting	Sackets Harbor, NY	Aug. 8, 2002	67
Study Board Public Meeting	Ogdensburg, NY	Sept. 19, 2002	76
Rotary Club of Cornwall, Sunrise	Cornwall, Ont.	Oct. 16, 2002	35
Grand View Beach Association	Greece, NY	Oct. 21, 2002	45
PIAG Round Table	Belleville, ON	Oct. 30, 2002	17
PIAG Public Meeting	Belleville, ON	Oct. 30, 2002	33

Audience - Organization	Location	Date	Approx. No. of Attendees
Long Sault Legion	Long Sault, Ont.	Nov. 16, 2002	60
PIAG Round Table	Trois Rivières, QC	Nov. 26, 2002	24
PIAG Public Meeting	Trois Rivières, QC	Nov. 26, 2002	32
Lion's Club Zone Meeting	Lockport, NY	Feb. 11, 2003	65
Rotary Club	Greece, NY	Feb. 12, 2003	90
Akwesasne Meeting	Akwesasne, NY	Feb. 20, 2003	10
World Water Forum	Kyoto, Japan	March 20, 2003	50
Grand View Beach Association	Rochester, NY	March 24, 2003	50
PIAG Round Table Meeting	Cornwall, ON	May 15, 2003	10
PIAG Public Meeting	Cornwall, ON	May 15, 2003	12
Lake Ontario Dune Coalition	Mannsville, NY	June 14, 2003	15
Grand View Beach Association	Rochester, NY	June 15, 2003	70
Great Lakes Mayor's Conference	St. Catharines, ON	June 16, 2003	50
PIAG Round Table Meeting	Niagara-on-the-Lake, ON	June 18, 2003	16
PIAG Public Meeting	Niagara-on-the-Lake, ON	June 18, 2003	9
PIAG Round Table Meeting	Wilson, NY	June 19, 2003	10
PIAG Public Meeting	Wilson, NY	June 19, 2003	61
Greece Rotary Club	Greece, NY	July 30, 2003	80
Native American Fish and Wildlife Society Northeast Regional Conference	Akwesasne, NY	Aug. 5, 2003	40
PIAG Round Table Meeting	Greece, NY	Aug. 7, 2003	14

Audience - Organization	Location	Date	Approx. No. of Attendees
PIAG Public Meeting	Greece, NY	Aug. 7, 2003	81
Sandy Pond Channel Maintenance Association	Sandy Creek, NY	Aug. 17, 2003	41
Kingston and the Islands Township Meeting	Kingston, ON	Sept. 8, 2003	9
PIAG Round Table Meeting	Sodus Point, NY	Sept. 10, 2003	13
Save Our Sodus	Sodus Point, NY	Sept. 10, 2003	68
United Church Women's Rally	Alexandria, Ontario	Sept. 16, 2003	25
The Committee on Inquiry	Geneva, NY	Sept. 16, 2003	25
IJC Biennial Meeting	Ann Arbor, MI	Sept. 19, 2003	50
Meeting at Kahnawake	Mohawk Nation of Kahnawake	Sept. 23, 2003	4
PIAG Public Meeting	Montreal, QC	Sept. 24, 2003	45
Comité ZIP du Haut Saint-Laurent	Notre-Dame-de-l'Île Perrot, QC	Oct. 1, 2003	25
Great Lakes Commission Annual Meeting	Chicago, IL	Oct. 3, 2003	50
Lake Ontario Fishing Coalition	Watertown, NY	Oct. 3, 2003	20
Greece Chamber of Commerce Economic Prosperity Committee	Greece, NY	Oct. 10, 2003	15
Comité ZIP Ville-Marie	Beaconsfield, QC	Oct. 14, 2003	20
Canadian Coastal Conference 2003	Kingston, ON	Oct. 17, 2003	40
Comité ZIP Ville-Marie	Dorval, QC	Oct. 22, 2003	30
Comité ZIP du Haut Saint-Laurent	Châteauguay, QC	Nov. 5, 2003	30
The Ingleside Women's Institute	Ingleside, ON	Nov. 19, 2003	16
NYS Dept. of State, Coastal Resources Division	Albany, NY	Nov. 20, 2003	10

Audience - Organization	Location	Date	Approx. No. of Attendees
Mohawk Nation of Kahnawake	Kahnawake	Nov. 20, 2003	5
Kiwanis	Greece, NY	Nov. 25, 2003	20
Broadcast Television	Western Monroe County	Dec. 8 and 22, 2003	N/A
Cornwall & District Environment Committee	Cornwall, ON	December 16, 2003	10
Akwesasne Task force on the Environment	Akwesasne Lands	Jan. 12, 2004	12
Canadian Association of the Club of Rome	Ottawa, ON	Jan. 15, 2004	40
Mother of Sorrows Men's Club	Rochester, NY	Jan. 20, 2004	95
Braddock's Bay Fish and Wildlife Association	Greece, NY	Jan. 29, 2004	10
Save the River	Alexandria Bay, NY	Feb. 7, 2004	80
Kodak Community Advisory Council	Rochester, NY	Feb. 9, 2004	20
CKON Radio Show *Tetewataron*	Akwesasne Lands	Feb. 11, 2004	N/A
Grand View Beach Association	Greece, NY	Mar. 22, 2004	50
Akwesasne Task Force on the Environment	Tsi Snaihne Fire Dept., Akwesasne Lands	Feb. 25, 2004	16
Akwesasne Task Force on the Environment	Kawehnoke Fire Station, Cornwall Island	Mar. 3, 2004	10
Akwesasne Task Force on the Environment	Akwesasne Lands	Mar. 17, 2004	10
Lockport Rotary Club	Lockport, NY	Mar. 30, 2004	35
New York State Wetlands Forum	Rochester, NY	Mar. 31, 2004	150

Appendix C

International Lake Ontario-St. Lawrence River Study

Summary of Akwesasne Concerns

April 1, 2002 – March 31, 2004

St. Regis Mohawk Public Meeting
Feb 20, 2003 1 p.m.

Ten tribal members, including Chief Smoke, Ken Jock (Director of the Environmental Department), Shawn Martin (former Study Board member), police and a few others attended.

Comments:

The tribal members raised the following issues of concern:

Need to take fishing grounds into account when setting water levels. When the Control Board holds water back upstream to mitigate anticipated flooding of Montreal during the Ottawa freshet, the Board should take into account the impact it has on tribal fishing. The fishing takes place above the Moses-Francis dam since the fish below the dam are too contaminated. (The tribe has about 10 commercial fishermen.)

Brad Parker, Environmental TWG lead, will follow up to determine the water level preferences of the fishermen.

Ottawa Freshet. Why take special account of the Ottawa River flooding? What about other rivers flooding into the St. Lawrence during the spring melt?

PIAG members explained:

- The potential impact of the freshet on flooding Montreal
- The Ottawa River flooding is substantially greater than other rivers/tributaries flowing into the St. Lawrence; and
- The Ottawa River freshet is the first of a series of flooding that develop during the spring thaw.

Why change water levels, do our views matter?
PIAG speakers and Russ Trowbridge, IJC liaison, said that the Mohawks views were very important; that is why we were holding the meeting. We very much want and need First Nations input into the Study. We will have another PIAG meeting in a year or so to update the community on the Study's progress. There would also be another public information meeting on May 15th for the broader community in Cornwall. Mr. Trowbridge, said the new IJC Commissioners would most likely visit St. Regis in the spring or summer.

What about the interests of the people living on the islands? Main concern is that they are losing beaches and other land due to erosion.

Response: We will take their views into account. We will be interviewing tribal members to get specific information. If there are similar problems related to water levels, we need to know about them.

Tribal Opposition to Seaway Expansion. Chief Smoke presented a petition signed by the tribal council strongly opposing the Seaway navigation expansion study. Ms. Kennedy and Ms. Weiss noted that our Study only concerns water levels, not Seaway expansion. Ms. Kennedy accepted a copy of the petition for information only, and suggested the Council send the original to their representatives in Washington.

The Study needs to take the Seaway expansion study into account – everything is connected.

Response:

- We don't know if the Seaway expansion would go ahead; and it is too complicated to get into this in the water levels Study.
- We are undertaking the Study because it is an important and current issue. It stands on its own merits.
- You are correct in that everything is connected. Therefore, if the navigation study goes forward, the work done on the current water levels management Study will be part of the foundation for the navigation study, since the work we are doing now will be taken into account. But it doesn't make sense to steer the current work towards a study that is only a possibility at this point and doesn't even have defined parameters.

Combined notes from CKON radio show "Tetewataron" in Akwesasne and public consultations at the Tsi Snaihne Fire Dept., Akwesasne Lands, and the Kawehnoke Fire Station, Cornwall Island

Radio show and consultations conducted by the Akwesasne Task Force for the Environment (ATFE), based on a LakeOntario-St. Lawrence River Study research contract, from February, 11 - March 3, 2004.

1. Hydrologic & Hydraulic Technical Work Group

1.1. Water levels around Akwesasne lands are not merely fluctuating four inches (10.16 cm). Levels for Lake St. Francis do not appear to be as constant as the Study is claiming them to be. At Hen Island, for instance, up to two-foot (60.96-cm) variations are observed from day to day. People are seeing extreme fluctuations within each week, some days as much as 2 feet (60.96 cm).

1.2. These fluctuations may be a result of peaking and ponding. Is the Study considering peaking and ponding? It may be difficult to say that peaking and ponding has an effect on water levels in Akwesasne. Another point to consider is whether the proximity to the actual dam influences the remarkable

fluctuations in water levels. Do other populations report such extreme changes in water levels, or is it a familiar scenario for people who live next to the dam?

1.3. Modelling is not being done on hourly fluctuations, just quarter-monthly means. Extreme water-level fluctuations at Akwesasne within a quarter-month may not be captured by the use of quarter-monthly means. Would it be possible to get the hourly fluctuation data from the Cornwall and Summerstown gauges?

1.4. In terms of seasonal fluctuations, one person observed that the levels dropped at least three to four (.91 to 1.22 meters) over the summer of 2003.

1.5. If averages per decade are used for modelling, then extreme events will not be captured.

1.6. ATFE wonders if using median levels instead of mean levels will help capture fluctuations.

1.7. Is the Study taking into consideration the affects from the Beauharnois Dam?

1.8. In Mohawk beliefs, you cannot control water levels. The Mohawk people do not believe in dams. When the Seaway and the dam came in, they changed the currents, created new marshes and caused sediments to collect in other areas.

1.9. Is the mean water level higher since the dam was put in? It would appear so based on observations.

2. Coastal TWG

2.1. Possible erosion due to water-level fluctuations (caused by proximity to the dam) at "hot-spots" identified by both Pacific International Engineering and the people of Akwesasne are not being adequately addressed by the current Study. The erosion is mainly being attributed to ship wakes.

2.2. Pacific International Engineering has confirmed that ship wakes and vibrations cause erosion. Ship traffic has started an erosional condition that probably won't stop.

2.3. Ship wakes have eroded islands in the shipping channel. One island (name to be confirmed) has nearly been cut in half. Also, in the south channel of Cornwall Island, the ships must increase their speed in order to navigate through the current coming from Polly's Gut at the west end of the island. This causes erosion on the south shore of Cornwall Island. Although a breakwall was constructed at the southern mouth of Polly's Gut, the currents in the shipping channel are still strong.

2.4. ATFE would like the Study to look at erosion and ship vibration problems in relation to extreme weekly levels and fluctuations, rather than quarter-monthly averages.

2.5. Undercutting is a problem. Residents are concerned that the road near Snye, which runs along the side of the River, may cave in due to undercutting erosion. This is also an issue on the southwest tip of Cornwall Island.

2.6. Erosion hot spots:

- Yellow Island—erosion the size of a football field on the western tip
- Cornwall Island—south shore, lost 75 ft. (22.86 meters) of land; pine trees falling into the River (This one point has been visually inspected by one of the Study researchers for ATFE; however, more erosion is suspected. The erosion here is difficult to discern from aerial maps.)

- Cornwall Island—north shore, lost at least 22 ft. (6.71 meters of land
- Cornwall Island—there used to be sandy beaches all around the island
- Mouth of Raquette River
- Thompson Island
- St. Regis Island—north shore
- Pilon Island—south shore

2.7. People are losing 3 to 4 feet (.91 to 1.22 metres) of shoreline in the summer.
2.8. Erosion happens where there's clay.
2.9. Artists take pottery clay. With erosion, this clay may no longer be available. [cross-reference: cultural performance indicator (PI)]
2.10. Since the building and operation of the Moses-Saunders Dam, farmlands have been flooded, and individuals have been unable to access their property. Some islands have been submerged. Simard Island was almost completely flooded.
2.11. Flooding and erosion have caused trees to disappear from riverbanks. Before the Seaway, trees would create canopies between islands. Now, there are no trees on the banks. The gentleman who stated this said that his grandmother told him this, so the time frame is about 45 years ago.
2.12. Some erosion-control measures have been implemented, such as boulders being placed along the shoreline. This may stop erosion, but has cultural impacts. People are unable to access the River in the same way. They cannot walk along the shoreline, gather at the riverbanks as families, etc. People used to dive off the trees and swim. This form of exercise is less available to them. There is more obesity in the community now. [cross-reference: cultural, health PI]

3. Environment TWG

3.1. Black ash trees, used for traditional basket weaving, have been lost due to flooding. Acres of woodlots lost. [cross-reference: cultural PI]
3.2. Sweet flag is pushed out by a proliferation of cattails. Sweet flag is a common medicinal plant. [cross-reference: cultural, health PI]
3.3. Marshes may be affected by ship wakes.
3.4. In general, fish have been used to give strength to people. They have had a ceremonial value. The decrease in fish consumption caused by a decrease in quality and quantity of fish has ceremonial, cultural and health impacts (people are consuming less Omega 3 fatty acids, which may have health effects). People used to eat three meals of fish per day. [cross-reference: ceremonial, cultural, health PI]
3.5. Walleye, a staple in the diet of the people of Akwesasne, has decreased remarkably. [cross-reference: health PI]
3.6. Perch, a staple in the diet of the people of Akwesasne, has decreased remarkably. [cross-reference: health PI]
3.7. Sturgeon, a staple in the diet of the people of Akwesasne, has decreased remarkably. [cross-reference: health PI]
3.8. Bullhead has been depleted. In 1990, they had their last annual bullhead feed, thus losing both a fundraiser and a cultural event. [cross-reference: cultural, health PI]
3.9. Endangered species of heron (which type, to be confirmed) on Hen Island.

4. Observations on water-level impacts not captured by a current TWG

ATFE is researching the effects of water levels on ceremonies, culture and health. [See above points under Environment and Coastal TWG headings for PIs that have ceremonial, cultural or health implications.]

The decrease in the activity of fishing has led to segments of Mohawk language being lost, i.e., the Mohawk word for "netting", and other fishing-related words.

5. Observations outside of Study mandate

5.1. People are very concerned that the Study results may be used to justify the Seaway expansion project.

5.2. ATFE is interested in the contaminated sludge hot spots around Cornwall Island (hot spots identified by the Remedial Action Plan in the Cornwall area).

5.3. Quality of water is an issue. One gentleman mentioned that he and his father would go fishing when he was a boy. He said that you could see the bottom of the River, about 25 feet (7.62 meters) deep, the water was so clear. They used to drink right out of the River with a cup dipped over the side of the boat.

Appendix D

International Lake Ontario-St. Lawrence River Study

Summary of Khanawake Concerns

November 20, 2003

This is a summary of the questions and concerns raised by the people of Kahnawake at the Lake Ontario-St. Lawrence River Study meeting at the Kahnawake Community Services Centre on November 20, 2003.

Kahnawake participants included Chiefs from the Mohawk Council of Kahnawake and representatives from the Mohawk Council of Kahnawake's Environment Office and the general community. Representing the Study were Christiane Hudon, Environmental TWG; Elaine Kennedy, PIAG; Tom McAuley, IJC liaison; Jean Morin, Hydrologic and Hydraulic TWG; Serge St-Martin, Recreational Boating and Tourism TWG and Michelle Tracy, Study Staff.

The meeting involved introductions, brief opening remarks by Mr McAuley and Ms. Kennedy, and then two short, but informative presentations by Dr. Hudon and Dr. Morin. Dr. Hudon's presentation focussed on the impacts of changing water levels on ecology of Lac St. Louis. Dr. Morin showed images and graphs of past and projected water levels and flows on Lac St. Louis, and specifically the Kahnawake area.

We would like to thank the people of Kahnawake for inviting the Study to participate in a dialogue with them about the impacts of water-level regulation. The following questions and concerns will be circulated to the Lake Ontario-St. Lawrence River Study Board, the Technical Work Groups and the Public Interest Advisory Group. They have been organized according to theme.

The Seaway

Much of the initial discussion focussed on the impacts of the Seaway, including a concern that the Study was gathering information for the project to further widen the Seaway. Prior to the Seaway construction, people depended on the St. Lawrence River for fishing, washing clothes, swimming and other community activities. The word "Kahnawake" reflects this reality, as it means "swiftly moving currents which we depend on daily for our survival".

Once the Seaway was built, people were cut off from living off the River. Impacts were numerous, including a change in diet and a subsequent increase in diabetes-related illnesses and cancers. Neighboring marshland was destroyed, which affected populations of pike, carp and muskrats. Elders now speak of "pipes floating in the water" (the ships). The River had been a place for family activities, and one community member remembered washtubs, clothes drying in the sun, a pot of soup cooking; others remembered swimming in the St. Lawrence.

Chief Tiorahkwathe questioned the notion of "progress", which to him was equivalent to a short-term right leading to a long-term wrong.

Tom McAuley and Elaine Kennedy reassured meeting attendees that the Study had nothing to do with the Seaway Review, and that many people were against the project, including people from as far away as Georgian Bay.

Environment

There were concerns about water quality, as it affects both fish (sturgeon spawning beds downstream) and drinking water, as well as contaminated sediment, especially near the Onake Paddling Club, where children play. People noted the disappearance of salamanders and small, centipede-like organisms used for bait (which in turn affected fishing).

There were conflicting reports about the numbers of ducks and herons. One person reported seeing less and less of them, while others reported seeing a return of herons and mallards, especially near the marina. Ecologists have even found mating egrets along the Seaway wall.

There were concerns about the spraying for the West Nile Virus, which is affecting pike, muskrats, turtles, ducks and cranes. There were also concerns about increasing zebra mussels.

Christiane Hudon suggested that an increase in herons could be due to a decrease in chemical pollutants, as toxins make heron eggs brittle. She also suggested that children playing in toxic sediment would not make them immediately ill—they would be more at risk of a bacterial infection from the water.

Jean Morin brought up the influence of the Châteauguay River, in terms of contributing agricultural chemicals and sediment accumulation into the bay near Kahnawake. This area has significant slower currents compared to the pre-Seaway period, and favor fine sediment accumulation.

On the subject of zebra mussels, both Dr. Hudon and Dr. Morin agreed that when water is slow, low and warm, chances are that there will be more mussels than there used to be.

Drinking Water

The Kahnawake water treatment facilities are upstream of the community. A pipe goes under the Seaway into the main part of the St. Lawrence River. 1700 homes in Kahnawake are on the water infrastructure, while 200 are on wells. There were concerns about water levels over intake pipes, water levels as they affect water quality, and the amounts of chlorine needed to treat the water at the purification facilities. However, there were also concerns about well water—especially in regards to the dumps in Kahnawake that leach toxins into the ground water.

Tom McAuley extended on offer from Denis Péloquin, of the Domestic, Industrial and Municipal Water Uses Technical Work Group, to do a survey of the Kahnawake water treatment facilities. In this way, the Kahnawake data would become a part of the Study.

Chief Eugene Montour replied that Eva Johnson would take this offer back to Council.

Recreational Boating

Water levels have been exceptionally low around Kahnawake's marina, which houses the Onake Paddling Club, as well as private boats. According to Serge St-Martin, one of the Study's criteria should be that there is enough water in October for people to pull their boats out of the water. However, as early as August, there was only 1 foot (30.48 cm) of water in the Seaway channel. Different people mentioned that they can practically walk across to nearby islands, and that they're seeing rocks they've never seen before near the marina.

One person wanted to know if it would be possible to have some machines come in and cut the weeds in the water at the marina. This, however, was deemed to be expensive and inefficient, as the weeds would grow back quickly enough.

Chief Eugene Montour wanted to know if it would be possible, through the Study, to lobby people to bring more water down the River. Elaine Kennedy replied that the Study was gathering information about desired water levels from people both upstream and downstream of the Moses-Saunders Dam. She underlined that one of the goals of the Study was to try to improve things for everybody, but that it wouldn't be possible to please everybody all of the time.

Closing

Chief Tiorahkwathe invited the Study to come and give its presentation again to more conservationists and Council Members. A suggested time was spring 2004.

Appendix E

International Lake Ontario-St. Lawrence River Study

Questions and Answers from Canadian Public Interest Advisory Group Public Meetings

April 1, 2002 – March 31, 2004

Belleville, Ontario
Afternoon Roundtable Discussion
October 30, 2002 2:00 p.m.

Holdbacks

Q1: Predictions lead to reactions regarding holdbacks. Is any work being done for long-term predictions for owners along the lakeshore?

A1: *In terms of parameters, the current plan endeavors to keep the regulation within four feet (1.22 meters). Natural effects can impact the range but the Control Board attempts to keep within the range. Over the last 40 years, only a small amount of incidences occurred outside of that range. Forecasting is difficult and even our ability to forecast weather beyond five to ten days is a challenge. Science provides support but not all the answers. One aspect of the Study includes the impact of climate change. In developing a regulation plan, one that is robust enough to include climate change is preferred. Models are currently being reviewed. The hydrology group is studying historical combinations from the past 100 years to develop high and low scenarios. (Coastal TWG - Ralph Moulton)*

It is understood that decisions by the Control Board impact inflows and outflows. We need to set the stage for best and worst case scenario so that regulations 10 to 15 years from now are responsive to various needs. We are seeing more dramatic situations and diverse reactions. (PIAG - Larry Field)

Recommendation: It is recommended that the plan identify impacts on various interests.

Influence on Controls

Q2: If you cannot control the system but can influence it, how much "wiggle room" is available? How restricted is the operation and is there room to maneuver?

A2: *In the presentation, the graph showed the two-foot (.61 meter) reduction from six to four feet (1.83 to 1.22 meters). One challenge will be to define the "wiggle room". Impacts from the release of some restraints and benefits from the relaxation of constraints are being examined. All options are being considered. The optimum level of ranges and timeframes need to be defined and overlaid with other interests. Details can be discussed in more depth another two years into the Study. (Study Board - Doug Cuthbert)*

Various needs around the Lake need to be better understood. A few windows of opportunity will exist and a few sacrifices may be recommended. Involvement is important. (PIAG - Marc Hudon)

The impacts of flooding and draught conditions are known. The effects of holding water back are dramatic downstream. If Lake Ontario is held back and goes up 2 cm (.79 inches) then Lake St. Lawrence will go up 23 cm (9.06 inches) and Montreal Harbour will go down 30 cm (11.81 inches). Extreme swings are experienced. Wiggle room in the Lake really affects the St. Lawrence. Wiggle room is less extreme in Lake Ontario. (PIAG - Elaine Kennedy)

Water Management

Q3: Will the IJC communicate results to the people in municipalities related to water management?

A3: *That is up to the Study Board. Criteria and regulations will be examined. However, flexibility and planning along the shoreline is needed as it relates to water level variation. Any further comments received will be brought back to the Study Board. (Study Board - Doug Cuthbert)*

Q4: The last two to three years have been noticeably dry with outflows from the Lake and evaporation. Relative to the small seasonal range in water levels and with respect to water withdrawal, is the aspect of municipal use and its significance being considered in the Study? What information will go back to the communities for planning purposes?

A4: *This issue has not really been discussed. Concerning water consumption in the Great Lakes and the effects on supplies, recent studies indicate that municipal uses within the basin are not increasing as had been expected. Consumption is estimated at five percent with some returning to the system through various avenues. The amount is very small and inconsequential. This factor is not relative to the Study. (Study Board - Doug Cuthbert)*

Q5: What is the impact of increased water use?

A5: *Municipal uses are small in comparison to agricultural uses. Much is evaporated or lost into the system. It is not a factor given the percentage of use versus impact. Climate change and natural variability are the significant points to consider. Eighty-five percent of the inflow to Lake Ontario comes through the Niagara River. Only 15 percent comes from various watersheds which accounts for groundwater intake and recharge from intakes. (Study Board - Doug Cuthbert)*

Consideration: Climate change and natural variability are significant points to consider.

Dredging

Q6: The review and approval of documents raises concern, particularly related to dredging. How will this be incorporated within the Study?

A6: *This is being discussed. Dredging has a potential impact on flows in the Great Lakes. However, dams effectively offset that impact. The range of water levels is a known factor. (Study Board - Doug Cuthbert)*

Q7: Regarding environmental impacts, demand for dredging may increase and potential impacts outside of wetlands may rise. Increased dredging creates more opportunity for intrusion of sediment impact. Comments?

A7: *The existing range is four feet (1.22 meters). The Study will examine how the system could be influenced to have less of an impact. Activities are designed taking into account minimum and maximum lake levels. With climate variations and impacts, influence on the system continues to be studied. (PIAG - Larry Field)*

The Study is still in the early stages. Basically, the existing structure is being reviewed. Greater fluctuations of outflows will be examined to determine whether it is beneficial to operate within a narrower or wider range. Determining a range that is most beneficial when looking at all interests continues to be explored. Fluctuation happens but the increases and decreases are not balanced. (Coastal TWG - Ralph Moulton)

Recreational Boating

Q8: Two weeks in August is the most critical period in the boating season. At times, boats cannot get out. Locally, damage has been slight, however, little improvement is seen. Comments?

A8: *The Study will identify impacts and respond to the needs between Canada and the U.S. The IJC will provide impact to any proposed changes. Marina information is important. For example, if this detail can be quantified it will assist in regulation. (PIAG - Larry Field and Coastal TWG - Ralph Moulton)*

Integrity

Q9: What is your definition of integrity?

A9: *With respect to the presentation, the natural integrity was intended. (PIAG - John Hall)*

Q10: Regarding biological and physical integrity, will these be weighted?

A10: *In terms of modifying the regulation plan, there are no criteria now that address the environment. Looking at integrity and factoring in environmental conditions are a concern. Perhaps one principle should be no net loss and to stimulate gains. Narrow levels, however, are not beneficial to environmental interests where highs and lows are needed to benefit wetlands. Details and definition are needed. Performance*

indicators need to be determined and reviewed. The water quality aspect likely will not be addressed in great detail. (Study Board - Doug Cuthbert)

No weighting has been designed for the Study although public insight would be helpful in determining tradeoffs between the various components (fisheries, wetlands, recreational uses, navigation and hydrological issues). Various viewpoints would assist in defining and rating formulas in an attempt to evaluate regulation plans. The no net loss policy that applies to fish and fish habitat is a good thing. (Environmental TWG - Brad Parker)

Q11: Biological, chemical and environmental integrity should be the main focus. Will the public have input?

A11: *The concern is understood. Weighting is not appropriate for this Study but what is appropriate is for the public to define what they consider most important. Public safety and environmental priorities is a common approach to address issues of concern. Public consultation is important for added value. (Environmental TWG - Brad Parker)*

This meeting is very important. To include public input and move forward, we will want to communicate again and keep informed. (PIAG - Elaine Kennedy)

To maintain the physical and biological integrity of the shorelines, we need to know the sensitivities, thresholds and concerns on water levels in the local area. (Study Board - Doug Cuthbert)

The previous range was approximately six feet (1.83 meters). Prior to regulation there were many more deviations. (PIAG - Larry Field)

Ranges, high and low occurrences and their timing need to be studied. Water levels are crucial in a wetland for a healthy mixture of plants and are important to recreational boaters. Many data sets are to be considered. (PIAG - John Hall)

Water Level Fluctuation

Q12: Why does the Lake go down two feet (.61 meters) every year?

A12: *Lake Ontario has a natural cycle, close to 40 cm (15.75 inches), and reaches its maximum in early summer (mid-June) so it is normal to see a natural drop from mid-summer to fall. This year was dramatic because the first six months were very wet bringing the level up 30 cm (11.81 inches) above normal. Levels were reduced to avoid going over the maximum followed by a six-week dry period and low supplies, which brought the level down rapidly measuring approximately a 60-cm (23.62-inch) drop. (Study Board - Doug Cuthbert)*

Q13: This appears to be an annual occurrence over the last six years. What in the system is making this happen? What can be done to stop it?

A13: *I understand you would like to see less of a drop. The difference between this year and last was drastic. With a wet spring, despite the dry summer, the regulation plan called for higher outflows. In hindsight, the Control Board would have acted differently. The impact throughout the system is delicate. Balance is difficult. (Study Board - Doug Cuthbert)*

Q14: Higher water levels (another two feet (.61 meters)) are needed in August to operate marinas. Low water increases silt and dredging costs. Comments?

A14: *High water is needed in June to maintain high levels. Lake Ontario levels need to be examined. (Study Board - Doug Cuthbert)*

The impact of increased and decrease flows is being studied. Results from modeling will provide a basis for better decisions. (PIAG - Larry Field)

In an attempt to develop a regulation plan that satisfies various demands, statistics are being developed to study the impacts of future Lake level fluctuations, natural variations and any combinations related to water availability, flows and supplies. (Coastal TWG - Ralph Moulton)

Progress

Q15: The Study would be better understood if we educated ourselves on the various issues. To proceed, we must learn the limitations and abilities while being cautious of raising false expectations. Efforts to improve regulations must be reasonable. Comments?

A15: *A change in this plan will not solve all local problems but with a better understanding maybe there will be a local solution regarding sedimentation and boating concerns. A wide range of variables exists. Proposed changes and the scope may be limited. (PIAG - Larry Field)*

The environmental aspect has been increasing over the years. Habitat is another large issue. The economic development of recreational boating appears to be a concern. (PIAG - Marc Hudon)

Fish and Wildlife Habitat

Q16: The loss of fish and wildlife habitat is a concern. Plant and animal communities lack biological diversity and the ability to maintain sufficient communities. Comments?

A16: *Although there is an influence on habitat, contaminant loadings affect fishing and fish consumption. Water quality and contaminant level issues are also a concern. Water quality issues seem to drive many factors and concerns. From a LaMP perspective, impacts from Lake levels should perhaps be considered. (PIAG - Larry Field)*

Comments

C1: From a levels perspective, recreational boating, marina operations, dredging and dock extensions need to be considered along with other related aspects including water

conservation. Shoreline levels for fisheries need to be further examined to determine impacts. More information is needed.

C2: A study on fish habitat in the Bay of Quinte area is underway. Priority wetlands have been identified and several around the Bay are being studied.

C3: Wetlands are important to warm water fisheries. Both warm water and cold water fisheries need to be considered.

C4: Shoreline erosion is also an issue. Residents in Rochester are very concerned with erosion, protection and shoreline management. Through the Conservation Authorities, erosion controls and setbacks are enforced to provide protection. Locally, however, a good part of the shoreline is bedrock so erosion is not a big concern here.

Belleville, Ontario
Evening Meeting
October 30, 2002 7:00 p.m.

<u>Water Level Fluctuation</u>

Q1: Rather than looking at a theoretical world, the real world says do not wait until the water drops three feet (.91 meters). A monitoring device is needed to flag conditions and provide warnings. Comments?

A1: *Valid criticism. Monitoring systems are not bad. The decision-making process needs attention. (Study Board - Doug Cuthbert)*

Q2: *Wellers Bay is an inland body of water separated from Lake Ontario by only one channel. Water level fluctuation is very hard to work with so when navigation dredging in the channel is based on existing chart datum we are concerned with how that will affect us down the road. Starting mid-August, the levels drop too fast and often boats are grounded. There has not been sufficient notice. Basically, we need enough water in the low periods. Existing chart datum should not be altered and a constant rate on the rise or fall of theLake should be kept. Comments?*

A2: *Due to the wet spring, more water accumulated than anticipated so a decision was made to let out more water than normal but shortly after, we entered into dry period and the rapid drop could not be avoided. To be more responsive to rapid fluctuations, the control system must allow adjustments to compensate for unexpected scenarios. We have heard numerous concerns regarding fast drops and will ensure the Control Board is notified. If a quick drop is required, I am hearing that communication in advance is critical. One element to consider is the different users in Rochester, New York. High water here translates to even higher levels in Rochester. (PIAG - Larry Field/Elaine Kennedy/Marc Hudon)*

Recommendation: Control influences so that water levels do not drop too fast or too early. Any rapid drops require advance communication. To be more responsive to rapid fluctuations and to compensate for unexpected scenarios, controls should allow adjustments.

Q3: One solution is not easy. It is not simple to control the Lake in an instant. Impacts are known but when the levels are lowered again it will be even worse. Comments?

A3: *Impacts are influenced within the four-foot (1.22-meter) range. The rapid decrease was faster than normal. The Study is an attempt to even out fluctuations. The existing plan was based on Lake levels and inflows from the 1800's. From data collection we need to update information and the system. (PIAG - Larry Field)*

Q4: Regarding the active charter boat industry in the Quinte area, when I relocated the vessel this year, the Port Authority assured me that the plan would be maintained and water levels would be similar to last year. Had I known that the water would drop so quickly, the boat could have been taken out of the water in a timelier manner and a $3K bill avoided. Advance notice would have been very helpful. Protecting the environment is important but surely plunging water levels should be detected at the weekly Friday meetings. The key is to advise of drastic changes in advance. Comments?

A4: *In terms of "wiggle room" (how fast and how much to change the system), you have to balance change and timing of flows at Cornwall. The natural cycle of the Lake drops 30 to 40 cm (11.81 to15.75 inches) normally but plunged 60 cm (23.62 inches) unexpectedly. The Control Board wants to be more attentive to these issues. (IJC liaison - Tom McAuley)*

Recommendation: To advise of drastic water level changes in advance.

Q5: Why can't they just maintain 91 cm (or three feet) above sea level as an objective?

A5: *A three-foot (91-cm) change on Lake Ontario could potentially impact the St. Lawrence River by 30 feet (9.14 meters), particularly by Montreal. With more controls you would need to build more dams. With the present system, policies and principals for water levels cannot be managed in this way. The water must fluctuate. (Study Board - Doug Cuthbert)*

Q6: I've heard there may be a plan to lower the Lake level. Some channels cannot be dug any deeper because of the rock and are threatened to becoming swamps. Incoming lake water keeps the weeds down. Comments?

A6: *Other groups are proposing to lower the Lake but not this group. (PIAG - Larry Field)*

Q7: Areas with previous high water levels are now dry and particularly noticeable after the civic holiday weekend. Inland water wells are affected when levels decrease. Fluctuation has choked some areas, floating docks are inoperable, unmarked rocks create much concern and amphibians suffer. Less fluctuation and a hold until Labor Day at Weller's Bay is needed. Shoreline management is crucial. Comments?

A7: *Comments noted.* (PIAG - Larry Field)

Recommendation: Inland water concerns. Weller's Bay requires less fluctuation and a hold until Labour Day.

Q8: To control actions, when planning to drop water levels quickly, mariners should simply be advised through broadcast on VHS (Channel 16) so that measures could be taken. Comments?

A8: *Comment recorded.* (PIAG - Larry Field)

Q9: Any comments on the discrepancies of how much water levels have dropped? Is there a definitive number?

A9: *The figure is a 60-cm (23.62-inch) drop since the peak mid-June. Data is available on the website and gauges are accurate to measure vertical drops. (Study Board - Doug Cuthbert)*

Progress

Q10: If the Study is in year two, what will happen over the next three years?

A10: *With respect to the Board of Control reacting quicker, it will take a couple of more years before the Study Board is in a position to make recommendations. Concerns here are echoed in other places and these will be passed on. However, Plan 1958D stipulates the regulations and will not be changed until the five-year Study is complete. It is a huge undertaking to balance contrasting concerns. (PIAG - Larry Field/Elaine Kennedy)*

Q11: Since 1958 didn't anyone keep records? We already know the effects.

A11: *Information collected over the past number of years has only been reviewed in terms of three main issues (hydro power, commercial navigation and water intakes). Now our society has changed and we have new needs that must be studied and balanced. We are constantly learning along with the scientists. Down the St. Lawrence on the Quebec side, we are screaming for water but will not get it according to the Plan. At low tide, the water is left in the Seaway channel six miles out. Tough conditions are experienced in other areas too. But all concerns will be gathered and reviewed to propose changes. Collaboration is important. The task is enormous. (PIAG - Elaine Kennedy/Marc Hudon)*

Q12: What is the status on the progress of this Study? Will this Study be different than ones in the past that were shelved? Will there be a useful product at the end?

A12: *Volunteers drawn from many agencies are spending clusters of time on the Study and a handful of staff is working full-time. The Study is on schedule and on budget. In year three, a lot of the technical work will be tabled and exposed and sensitivities listed. The exciting parts will come in year four. In year five, the receptivity will also be an interesting time. The Commission is committed to making changes and responding to recommendations. (Study Board - Doug Cuthbert)*

Funding

Q13: Is funding forthcoming?

A13: *No negative signals to date. Funding is year to year and requested from both sides. Strong political support from both sides is provided. Uncertainties do exist but the Study will be completed in response to common concerns among various public interests. Any withdrawal would likely stir too much controversy. (Study Board - Doug Cuthbert and PIAG - Elaine Kennedy)*

Q14: Is the Study going to compare the cost of adaptation with levels of control? Seven million dollars would go a long way to alleviating shoreline damage.

A14: *We have the ability to do that but the depth of comparison is uncertain at this time. A lot of other issues come into play. One of the Technical Work Groups will be evaluating the impacts of erosion and costs of shoreline protection related to adaptation opposed to succumbing to damages. With respect to adaptation for commercial navigation on the St. Lawrence River, in May 2003, new ships that are over 900 feet (274 meters) long with good maneuverability able to deliver full loads in optimal conditions will be purchased. (Study Board - Doug Cuthbert, Coastal TWG - Ralph Moulton, and PIAG - Marc Hudon)*

Credibility

Q15: It is not fair that a lot of information has been thrown at people to digest. Highly trained people review Lake level operations every Friday, however, Lake Ontario has been down more than three feet (.91 meters) since July 15 impacting every inlet and cove. I had to pull my boat out. Three feet (.91 meters) is a lot of draft. There seems to be a lot missing. What power of recommendation is there at the end of the data gathering and are you credible to do anything about it? What is actually being done?

A15: *With respect to the overall Study, concerns are being echoed throughout the Great Lakes and St. Lawrence. We are looking at levels and will make recommendations for improvements to the IJC who will pass information on to the Control Board to regulate the plan. In comparison to last year, there has been a huge drop in levels. Water was held back on the Lake due to concern of drought conditions knowing that water is needed at the end of summer into the fall. Normally, there is always a cyclical drop in levels from June through fall. A sensitive time for shipping and boaters is in the fall months when levels are impacted the most. Water was therefore held back to compensate. However, this year we had a very wet spring and the water levels rose much higher than a year ago. Come June, there was concern that water levels were still rising so the regulation plan called for more flows. However, it got warm and water supplies dried up with no rainfall. Both situations acted to pull the level down very quickly. We need to know how to change the regulation plan to be more responsive. (Study Board - Doug Cuthbert)*

Q16: At the Cataraqui Region Conservation Authority, we are hearing this is an intricate issue and sympathize with the boating concerns. We know that inland watersheds are managed by the Conservation Authorities. Federal and provincial agencies and

municipalities have a large stake along with Quebec and the U.S., however, I do not see a group directly involved in speaking with government groups to ensure that the rules and regulations applied have impact. What are your comments on inter-governmental affairs?

A16: *There is a huge need to have linkages between federal, provincial, municipal and Conservation Authority officials. Through members of the Study Board and PIAG, all agencies are represented. When recommendations go back to the IJC, those linkages have not yet been determined. (Study Board - Doug Cuthbert)*

Q17: Are these representations at the political or staff level where final decisions are made?

A17: *Staff level and technical level. It is not political. (Study Board - Doug Cuthbert)*

Q18: What is the Board looking at that is concrete? They have a lot of power and can raise a lot of money because they are international. What happens in Rochester happens in Cobourg. They seem to express concerns more vocally in Rochester.

A18: *Sensitivities are greater in Rochester than in Cobourg and Belleville. In terms of reversing adjustments and realizing the impacts, the Study is trying to better understand the system and to keep balance even with fluctuations. (Study Board - Doug Cuthbert and PIAG - Larry Field)*

Political Interaction

Q19: When dealing with public interest groups, shouldn't the politicians be involved since they have to make the final decision?

A19: *At the Study level we do not have the mandate to link with the politicians. The Commission will take the lead in that context. However, interaction at the political level is a good point. Generally, people involved in the Study are not elected. (Study Board - Doug Cuthbert)*

Recommendation: Political interaction is recommended.

Inland Waterways

Q20: Previously, tree harvesters that looked like old fashioned combines used go through Lake Scugog in a conga line to cut plants right at the bottom and all boaters had a wonderful time for two to three years. I haven't seen one since 1974. Where are they and why hasn't the Fisheries Department or a government authority set those things in motion? You can hardly move in some of the inland waterways, bays and coves.

A20: *The Study is also looking at environmental issues, wetlands, fish habitat and regrowth. The Study is trying to balance recreational boating needs with the natural environment. The Study group is looking at competing issues but does not look at inland lakes. (PIAG - Larry Field)*

Water Usage

Q21: Levels used to fluctuate up to four feet (1.22 meters) but since the St. Lawrence Seaway has been in operation, I have noticed that levels have not varied that much. Enough potable water is going out to the ocean to almost satisfy the world. We are wasting a tremendous amount of water. Why are we not keeping it in the Lake? To save Montreal from embarrassing sewage issues water levels remained high to compensate for insufficient sewage treatment plants. Perhaps a lock system should be in place similar to the St. Lawrence system to control water and allow the U.S. access to take more water possibly even helping to pay for the lock.

A21: *The range of fluctuations has narrowed since the structures were built in the 1950's. Through the Study we are examining if narrowing needs to be increased or decreased. (Coastal TWG - Ralph Moulton)*

Regarding water being wasted, water has value in any location. Water going down the River sustains wetlands and is valued in terms of the natural environment. Massive structures would be needed for control. The effects of holding water back are dramatic downstream. If Lake Ontario is held back and goes up 2 cm (.79 inches) then Lake St. Lawrence will go up 23 cm (9.06 inches) and Montreal Harbour will go down 30 cm (11.81 inches). Extreme swings are experienced and although water is a precious commodity the effects must be considered. (Coastal TWG - Ralph Moulton and PIAG - Larry Field/Elaine Kennedy)

Concerning Montreal, over the last ten years, a sewage treatment plant has been constructed on the east side and has addressed some of those problems. Dilution of sewage is no longer an issue. Although it has crossed many minds, a dam to regulate the flow would likely damage and kill many fish and wildlife in the St. Lawrence River and would impact commercial navigation. Much of the flow supplies drinking water to many municipalities. Beyond fresh water, salt water creeps upstream slowly and contaminates the well. The impact of higher salt water levels is a concern. It is a complex system. Everyone ponders how to protect our precious water supply. (Coastal TWG - Ralph Moulton and PIAG - Marc Hudon)

Q22: The hydro supply is a concern. The minute water gets into Lake Superior, it should belong to Ontario Hydro but it becomes half Canadian and half American. The drainage canal 40 years ago had a limit. From past work experience, $4K is lost per day. Has anyone looked into that?

A22: *Diversions into Lake Superior fluctuate yearly. There are three main locations for power generation on the Great Lakes system that are international (Sault St. Marie, Niagara Falls and Cornwall). That arrangement was reached in 1942 when Canada asked the U.S. for diversion of water into the Great Lakes but since then no attempt to change that arrangement has occurred. This concern rests outside of the Study parameter. (Coastal TWG - Ralph Moulton)*

Other Proposed Changes

Q23: Driven by commercial navigation interests, I understand the U.S. Army Corps of Engineers will propose fairly large changes to the system to remove entire islands through an eight-year study pending approval and funding ($10 million each Canada/U.S.). Are you partnering with them? Will the models change from that study group?

A23: *The Toronto Region Conservation Authority took a position for the Canadian government not to participate due to the massive changes proposed. Both supporting and opposing letters have been received from various interest groups. The U.S. Corps of Engineers has done a recognizance study that has been sent to authorities in Washington, however, it is undecided whether to proceed to the next level to complete a feasibility study. Some efforts to include it in the U.S. budget have been attempted but issues remain controversial. It is not clear whether the U.S. government will proceed. Transport Canada would be the Canadian lead. Long-term viability is a concern. On the assumption that this study will not go forward since unapproved, the International Lake Ontario-St. Lawrence River Study is proceeding. (PIAG - Larry Field and Coastal TWG - Ralph Moulton)*

PIAG Roundtable Meeting
Trois-Rivières
Nov. 26, 2002

Q1: Do you have any data on the impacts of the St. Maurice River, whose significant outflows influence the St. Lawrence?

A1: *The zone of Study ends at the eastern edge of Lac St. Pierre; however, where hydraulics (levels and flows) are concerned, the Study extends to Batiscan in order to take into account the influence of the St. Maurice River. (Study Board - André Carpentier)*

Q2: Can you explain why we experience water-level variations of at least 30 centimetres two times per day? Is it related to the four-foot (1.22-meter) fluctuation allowance?

A2: *We established the regulation plan 1958-D in order to try to keep the fluctuations on Lake Ontario within four feet (1.22 metres). In your case, I think you're experiencing fluctuations due to tides as well as fluctuations from outflows, as outflows would not vary that rapidly on their own. Even when there is a fluctuation of 600 m3/s from Lake Ontario, there are many attenuating effects in all of the lakes along the River. And the more we go downstream, the more the fluctuations from tides become significant. In Quebec City, it's a question of metres, while you're talking about 30 cm (11.81 inches). (Study Board - André Carpentier)*

Q3: How long does it take for water to flow from Lake Ontario to Lake St. Pierre?

A3: *On average, in the spring, it takes between 36-48 hours. In the summer, it can take approximately 60-72 hours. (Study Board - André Carpentier)*

Q4: Between commercial navigation, wildlife habitats, recreational boaters and riparians, who has priority in terms of water-level management?

A4: *Plan 1958-D has to follow the priorities established in 1909 by the Boundary Waters Treaty: domestic water uses, commercial navigation and hydropower. Unfortunately, in the 1950s, neither the environment nor recreational boating were considered. It's one of the mandates of this Study to try to correct the regulation criteria to integrate recreational boating and environmental issues. That is why we are doing so many studies in order to determine, once we propose changes to the regulation plan, what the impacts will be for all interests, including hydropower, commercial navigation and the environment. (Study Board - André Carpentier)*

Q5: There are some fish that spawn in rapids and others that spawn in calm waters. But in the spring, what are we doing to ensure that we don't disturb the spawning grounds?

A5: *Ultimately, there will have to be certain "compromises". We cannot flood residences along with wetlands. We cannot completely drop the water levels in order to favour the emergence of wetlands or spawning grounds to the detriment of the other interests that are there. But time creates compromises as well. The evolution of water levels is different from one season to another and from one year to another. So there will probably be the development of conditions that will favour one interest without harming another. (Study Board - André Carpentier)*

Q6: Why are we experiencing such dramatic lows in our region (Trois-Rivières)? Recreational boaters are finding themselves with inaccessible rivers. In Batiscan, Nicolet and even in the St. Maurice River, there are high river bottoms. We're also seeing islands disappear. Recreational boaters also have the problem of trees at the River bottom, hazards and accidents.

A6: *In the spring, about 15,000 to 16,000 m3/s of water flows into Lake St. Pierre, while in August (this year, for example) there was about 6,000 to 7,000 m3/s of water. So the difference is due to the changes in seasonal and climatic conditions. There is not a lot of water. The Control Board maintains a minimum level in Lake St. Louis so as not to hamper commercial navigation or water intakes in Lake St. Louis , and this is felt in Montreal Harbour and in Lake St. Pierre. So the impact is beneficial, even downstream. (Study Board - André Carpentier)*

Q7: Where does the influence of the tides stop?

A7: *Generally, it is accepted that the bulk of the tides die out in Lake St. Pierre, but if we look more closely at the data, we can detect, over a month, a tidal signal all the way to Montreal Harbour. (Coastal TWG - Jean-François Cantin)*

Q8: We have big problems with riverbanks in Champlain, Sainte-Marthe, Sainte-Anne-de-la-Pérade. We're seeing heavy damages—the people there are losing their land. Last year there was a woman who was mowing her lawn on her tractor, and the land crumbled and she ended up in the River. Is it the dredging of the River—Seaway navigation—that is causing this? Will there be agreements made with Quebec?

A8: *We are using the best tools, the best science possible to determine what impacts relate to natural processes (such as erosion), which take place regardless, and*

commercial navigation. I don't know what agreements exist between governments, nor what actions they are going to take. (Coastal TWG - Jean-François Cantin)

There are erosion phenomena that exist. Some are as a result of natural processes, but we're mapping this data, we're identifying the type of embankment, the type of eroded material and the type of protection. So we're at that stage—the problem identification stage—and we'll see later what we will do. (PIAG - Marcel Lussier)

On Environment Canada's site there is a study on bank erosion from Cornwall to Lake St. Pierre. The study includes photos and bank regression rates. (unidentified)

Q9: I think that the mayors and councillors should be the first to be informed. Have they all been invited to the session today? Champlain, Sainte-Marthe and Sainte-Anne-de-la-Pérade are three municipalities that are very affected. I would have wanted to see some of those people informed.

A9: *You can inform then. Tell them that very soon the erosion committee will produce maps of the area showing eroded zones, type of embankment, and that, from there, we will build solutions. (PIAG - Marcel Lussier)*

Q10: I think that citizens of Quebec, people from abroad—from Europe—should have access to the St. Lawrence River. I'm thinking of accessibility in general—public accessibility. Is the government of Quebec taking steps to ensure that municipalities reserve certain public places along the River?

A10: *Is this not in the water policy that our Minister is releasing? However, we're not dealing with accessibility in our Study. (PIAG - Marcel Lussier)*

Q11: What are the parameters used when we talk about water quality?

A11: *We have a major interest in the management of the levels in the St. Lawrence. We deal with turbidity (the measure of suspended particles in the water), the colour of the water, and organic matter. We have treatments to ameliorate the quality of the water, which could be influenced by water levels. For example, if water levels are very low one year and higher the next, the embankments are scrubbed and there's a rise in organic matter, which results in the need for treatment plants to use more chlorine in the production of drinking water. (PIAG - Michel Gagné)*

Q12: I am from the Canadian Power and Sail Squadron. I am also a riparian at Repentigny and owner of a small marina which used to have four boats, but which doesn't anymore, as there isn't any water. I would like to know if you are really below the four-foot (1.22-meter) critical level on Lake Ontario, and if you are not, could you possibly give us a bit more water...

A12: *We are not below the four feet (1.22 meters). (Study Board - André Carpentier)*

From what I hear from marina owners all along Lake Ontario is that the Lake is too low. We're not currently holding water back on the Great Lakes. (PIAG - Marcel Lussier)

We have a contract of $200,000 to do three different surveys. The first one is of 150 marinas or yacht clubs, and we're going to ask what social and economic impacts water levels have on these enterprises. The second survey is about tourism—170 owners of cruise and tour boats from Toronto to Trois-Rivières will be included. We will ask them what impacts water levels have on them. The third is for boat-launch users, who could be recreational boaters, fishermen or hunters. We will ask them if they go to a marina or yacht club. Then we'll ask if they use a trailer, if they go to a launch site or if they're a riparian with a private quay. We'll have analyzed the results by the end of March 2003. It's important that you know this is going on. (Rec. Boating TWG - Serge St-Martin)

Q13: Two years ago, a process was instigated in Canada to gather operator cards for all recreational boaters. Why not take advantage of this to collect data?

A13: *We won't be able to, because the data banks are private. Also, they won't be complete before 2009. (Rec. Boating TWG - Serge St-Martin)*

Comment

I represent the commercial fishermen of Lake St. Pierre. In mid August, due to low levels, there was no longer any access to the Lake between the St. François River upstream and the Nicolet River downstream. We're talking about small fishing boats. Also, there generally seems to be a link between water levels and fish catches. If the levels are high on Lake St. Pierre, the catch is good.

Q14: In terms of the three recreational boating surveys, is it possible for them to continue in the direction of Donnacona?

A14: *I can tell you that we won't reach Donnacona. There, you're no longer dealing with the water levels of Lake Ontario—you're dealing with the tides from the St. Lawrence. (Rec. Boating TWG - Serge St-Martin)*

Q15: If the study zone ends at the eastern mouth of Lake St. Pierre, whom should we contact in order to have help or support?

A15: *You can consult Environment Canada—they cover the River until the Gulf. There is also the Canadian Hydrographic Service. For aerial photographs and/or large-scale, high-precision maps, you can consult provincial or federal governmental organizations. (Coastal TWG - Jean-François Cantin)*

Comment

If the water levels continue to drop, there will be less pressure from fresh water, and the salt-water tides will have a farther reach. We could have salt water in Lake St. Pierre.

Q16: Will the Joint Commission really be ratified by the governments?

A16: *According to plan 1958-D, the governments gave the International Joint Commission the power to regulate Lake Ontario. The governments also gave the International*

Joint Commission the power to study this question, and they gave us the necessary funds to do so. The International Joint Commission asked a study group to use the science from a number of technical work groups in order to come up with the best plan possible. Once the best plan possible will be developed, the International Joint Commission will get involved to ask people if they have any comments. Then, it will ask the governments if we have the mandate to implement the new plan. (IJC - Fabien Lengellé)

Q17: What impacts will Americans and ship owners have on riparians within the next five years for the IJC?

A17: *The mandate of the International Joint Commission is to channel all opinions, all points of view, all of the ins and outs of the system; then to consider the advantages and disadvantages of such and such a position and then to adopt a regulation plan that will result in the most benefits for all with the least adverse effects. We cannot say such and such an interest, such a use of the system, has priority over another, except maybe those that are named in the Treaty. This being said, the IJC is committed to weighing all interests so that all do well. (IJC - Fabien Lengellé)*

Q18: Can we have access to the information on the water levels at the Moses-Saunders Dam? This would give us an idea of what to expect in Lake St. Pierre a few days later.

A18: *You can go on the website of the International St. Lawrence River Board of Control: www.islrbc.org/ . They change the outflows on Friday. Usually, the outflows don't vary more than 300 m3/s from one week to another. On this site, you will also find the levels for Lake Ontario, Lake St. Louis and Montreal Harbour, as well as the outflows for the Ottawa River. On Environment Canada's website, you'll find the levels for Lake St. Louis, as well as the outflows from Rivière-des-Prairies, Rivière-des-Mille-Îles and La Salle. The Canadian Wildlife Service also provides a series of water levels for the whole length of the St. Lawrence. (Study Board - André Carpentier)*

Comment

The hydrology group will be studying climate change. We've hired specialists who will revise the three most popular models—from Canada, Germany and England—in order to come up with climate change scenarios. The plan they want to propose will be a plan that looks ahead 20, 30 or 40 years, so it has to be robust enough for all types of supplies and for natural variability. (IJC liaison - Tom McAuley)

PIAG Public Meeting
Trois-Rivières
Nov. 26, 2002

Q1: The silting of sand at the mouth of the St. Anne River is an important concern for the small fishermen of the St. Anne River's Outfitters Association. Can the Commission consider our concerns?

A1: *The work that we're doing on erosion has really taken place between Cornwall and Trois-Rivières. It is not part of the Study's mandate at this time to look at the silting of sand at the mouth of the St. Anne River. (Coastal TWG - Jean-François Cantin)*

Q2: If the St. Lawrence Seaway is redone to enable the passage of larger ships, there's a risk that the River at Sainte-Anne-de-la-Pérade will become a mere channel.

A2: *The study on the widening/deepening of the Seaway has not yet begun. Currently, even in the industry, there are many players who are against the widening/deepening of the Seaway, simply due to the fact that the ships are built for the current dimensions, which would put them at a disadvantage. (Commercial Navigation TWG - Anjuna Langevin)*

Q3: Are you using the modelling that was done by the group that studied the impact of dredging the channel at Lake St. Pierre?

A3: *We are using tools similar to those that were used during that study, but our tools are even more refined. Future dredging does not factor into our Plans of Study nor our scenarios. We're working on erosion and flooding in order to quantify, with the best information, the science and the possible tools, as well as the negative impacts of different causes of erosion, including commercial navigation. (Coastal TWG - Jean-François Cantin)*

The Joint Commission regulates the flows coming out of Lake Ontario. Thus, the question is how to minimize the impacts of flow regulation. (Canadian General Manager - Ed Eryuzlu)

Q4: The mouths of rivers have been silted up for 8-9 years, and the fishermen have trouble accessing the water. The fishermen fish on Rivière du Loup at Louiseville; they're from Pierreville and Nicolet. There are recreational boaters from Nicolet. At Nicolet's yacht club, the water level is down to chart datum. Can the Commission help us solve this problem of access at the tributary mouths?

A4: *We're doing a survey of fishermen and recreational boaters in a basin of about 60 kilometres, so that we inventory all of the tributaries to the St. Lawrence. We're going to have information on the fishermen from Louiseville, Pierreville and Nicolet in our survey. I'm noting that the silting of sand is a problem. I did not realize that it was such a serious problem. We want to know what your problems are. But there are problems that we're going to be able to solve and others we will not be able to solve. (Rec. Boating TWG - Serge St-Martin)*

Q5: I would like to have a better understanding of your mission—the reason that you're doing this Study and collecting tons of information. Is one of your objectives to ameliorate impacts with regards to water levels?

A5: *The mandate of this Study is to see if we can modify the regulation criteria to integrate all the environmental issues and the problems associated with recreational boating, both on Lake Ontario and the St. Lawrence River, while at the same time respecting the other users: domestic, industrial and municipal water uses, commercial navigation and hydroelectric production. (Study Board - André Carpentier)*

Q6: Are the Americans removing water at a rate that is causing water levels to drop in the Great Lakes and the St. Lawrence River?

A6: *According to the Boundary Waters Treaty, Canada and the United States each have 50% rights over boundary waters. The Americans equally share the Great Lakes. And if you ask the people from Detroit, from Chicago and from Cleveland what they think of diversions of water from the Great Lakes, they'll respond with as much conviction that they want to keep the Great Lakes in their own backyards. Also, it is not economically feasible to transport water from the Great Lakes to arid regions. (IJC - Fabien Lengellé)*

The consumption of water for domestic use, for irrigation, etc. is equal to about 1% of the water that goes into the Great Lakes—that's what doesn't come back. The rest of the water flows into the St. Lawrence to the estuary. (IJC liaison - Tom McAuley)

Q7: The 1909 agreement has just been mentioned, but this came after a treaty between England and the United States, in which England ceded water levels of the St. Lawrence River and the Great Lakes to the United States. Was this situation corrected in 1909?

A7: *Yes, absolutely, the Boundary Waters Treaty of 1909 replaced all of the previous agreements may have been signed by the Dominion of Canada and the United States. (IJC - Fabien Lengellé)*

Comment

On behalf of the 400 members of the Parc-des-Rapides Committee, I would very much like to thank all of the people, whether they volunteer or are paid, who are working for our grandchildren to ensure that they have this water. I would like to thank you from the bottom of my heart, and I am very happy that you are here in such great numbers tonight. Thank you, Mr. Lussier, as well.

Q8: Keeping in mind the three main criteria (the Seaway, hydroelectricity and potable water), what margin of manoeuvre is left for you to take into consideration the other criteria, like environment, for example?

A8: *The three additional criteria (environment, riparians and recreational boaters) will be considered along with the three elements from the first management plan, and the different parameters will be weighed. We're going to keep in mind all the elements*

and choose a management plan that will create the fewest impacts for all concerned. (PIAG - Marcel Lussier)

Q9: Can you explain in more detail why your Study ends at Lake St. Pierre?

A9: *The management of water levels by the Moses-Saunders dam has some influence all the way to Lake St. Pierre. After that, the influence of the tides takes over. (PIAG - Marcel Lussier)*

PIAG Roundtable Meeting
Cornwall, Ontario
May 15, 2003

Comments

C1: My constituents' concern in St. Lawrence County is that Lake St. Lawrence is the sacrificed area for the regulation of the St. Lawrence River and Lake Ontario. When Lake Ontario is raised or lowered, the effect is amplified in Lake St. Lawrence upstream of the Moses-Saunders Dam. There is an impact on shoreline owners, dock owners, marina owners. One thing that I hope might come out of this effort is a plan that reduces the magnitude of those impacts.

C2: I represent the Treemont Island Association, which is just off Gananoque. I would say our current levels are about what we expect to see at the end of July. This affects access to people's cottages on the island. And there are many islands like ours. I know when we talk to people on the island; they say that the River is being drained to fill up Montreal for commercial traffic. My concern would be the preponderance of the commercial impact on the decision-making processes.

Q1: I am from the Frontenac Islands, and our biggest problem is ferries. We have four ferry systems, and when we get into the fall of the year and the low water; our ramps don't go down far enough. I think the water levels are getting a little lower every year. Does anybody have a record of how much is evaporated?

A1: *The evaporation off lakes in this region averages around 50 to 60 centimetres a year, so that's the better part of a metre that could be off Lake Ontario, but it varies considerably according to the year and the temperature. They know how much water comes in through precipitation onto the whole of the Great Lakes, and they also know how much went out the St. Lawrence—that's accurately measured. They can only estimate the evaporation as a kind of leftover. (IJC liaison - Tom McAuley)*

Q2: What is the average geodetic elevation of the River and how much above and below is the acceptable limit? What can we expect to see in fluctuations?

A2: *The flood allowance on Lake St. Lawrence is 74.48 metres. We have an alert level at 74.12 m. We keep Lake St. Lawrence at or below 73.87 m as a daily average. (Mike Budalero)*

Q3: I live right off one of the tributaries, and when the water levels fluctuate, I see it right at the end of my laneway. Is the Study looking at the tributaries? When you raise and lower the levels on the St. Lawrence, you dramatically affect the tributaries and the fish habitat and spawning grounds there. If the water levels go down, the fish either dry up farther upstream or the water becomes warm, and I'm just wondering if this is all taken into consideration.

A3: *One of the challenges that we have is to look at all the sectors of the environment. Fortunately, the one that you have identified, which is primarily spring spawning northern pike, is the centre of many of our studies. We have selected different indicators of environmental stress, different performance indicators; one of these performance indicators is northern pike. Some of the best scientists in North America are studying and developing models of northern pike and how different water levels will impact them positively or negatively. (Environmental TWG – Brad Parker)*

Q4: Recreational boaters in the basin of Lake Ontario and also the Thousand Islands end up with low waters in the fall, and I wonder if the Commission would expand itself eastward. If we had some sort of holding pattern on the other side of Montreal, would that not solve a lot of our problems?

A4: *It is often a public concern that Lake Ontario will be dried up to satisfy Montreal's needs in terms of commercial navigation. But when the waters are low, they are low for everybody. We've had several very dry years in the past where the ships were loaded less and less each time and where 40% of the time we were below chart datum. We also have ports downstream of Montreal—we have Sorel, Trois-Rivières, and they are also affected by water levels. The idea of a dam is good for Montreal, but it raises concerns. (Commercial Navigation TWG - Anjuna Langevin)*

I don't think that you could ever get a structure built downstream from Montreal that would hold back water the way that you are talking about. It would be too costly, and it wouldn't pass an environmental assessment. (PIAG - Elaine Kennedy)

I think there is some confusion between natural hydrological cycles and the Control Board and what it does. The Lake has a natural cycle and reaches its peak in midsummer, usually around the end of June, and then it goes down to its minimum amount at the end of December-January. It goes through that cycle over the years and has for hundreds, thousands of years. (IJC liaison - Tom McAuley)

Q5: I'm interested in finding out more about erosion on Lake Ontario. How much information is coming in, or is being presented to the public as to what is normal erosion or natural erosion, given that shorelines never stay the same, and they are always going to erode?

A5: *There are different shoreline types around the Lake; there are different shoreline types on the River, and there are different reasons why these shorelines erode at different rates. There's a strong correlation with high lake levels and erosion at the face of a bluff or at the water's edge. But few people realize that during low water periods, there is still erosion going on. Those waves striking the shoreline at a location farther out are actually deepening the Lake or River bottom at that location,*

so that when you get back into a high water period, you've now got a deeper water column, bigger waves, and the process starts all over again. We're also finding out that ship wakes have a greater impact on erosion than people realized. (Coastal TWG - Tom Bender)

Q6: One of my concerns is the fact that we have a key spawning area in Hupple Creek on the St. Lawrence. If the level of Lake St. Lawrence goes down during walleye spawning, there could be a definite problem. And the Hupple Creek walleye spawning area is one of the major spawning areas from the Cornwall Dam all the way up to Kingston.

A6: *Hupple Creek is a very unique location for a specific time. The Environment Technical Work Group is looking at various unique habitats, not just indicator species. (Environmental TWG - Brad Parker)*

Q7: If we dropped the levels in late summer, could we have vegetation growing on the shoreline that would help in springtime to control erosion?

A7: *Yes, but in very limited areas on the River. There are very few areas where that could happen on the Lake, because the wave energy is so great there. (Coastal TWG - Tom Bender)*

Q8: Is there any good information, historically, about what the water levels were like before the Seaway went in?

A8: *I think Lake Ontario could vary about eight feet (2.44 meters). And Lake St. Lawrence maybe a little bit more. Now the lakes should not vary more than four feet (1.22 meters). (Study Board - André Carpentier)*

What nature gives us; we can only look at controlling a certain amount. (PIAG - Elaine Kennedy)

Q9: How do we ensure that foreign ships dump their ballast outside of the St. Lawrence Seaway so we don't keep getting foreign species that have no know predators?

A9: *There are U.S. regulations that make the water exchange mandatory for all of the ships that enter the Seaway. This is done anywhere outside the 200 nautical mile limit. The enforcement is done by the U.S. Coast Guard, and they have an inspector at the Seaway. (Commercial Navigation TWG - Anjuna Langevin)*

The federal government of Canada is going to recommend to the IJC that they keep the exotic species issue a priority for a number of years yet. (Study Board - Lynn Cleary)

Q10: One of my concerns is the wetlands. We need areas where the little fish can develop and spawn.

A10: *We need wetlands for small, young-of-the-year fish production, frogs, birds, etc. The Environment Technical Work Group is concentrating on wetlands. (Environmental TWG - Brad Parker)*

Q11: Who is going to enforce what the Study Board decides?

A11: *At the end of the five-year Study, the Board will present at least three options of regulation plans to the IJC. The Commissioners will probably have hearings in 2005, and then they will make a decision on which plan they think should be put into place. Then they will check with the governments of Canada and the United States, although they don't have to seek their approval, and then the new plan will come into vigour in late 2005 or 2006. (IJC liaison - Tom McAuley)*

Q12: A lot of marinas are built to a scale by the individual and not necessarily to a scale that's going to be adaptable ten years down the road. As a result, we end up with a problem. Could the International Joint Commission recommend that the government regulate what is done on the waterfront? Then we may not have some of the problems we have now.

A12: *(Inaudible answer)*

PIAG Public Meeting
Cornwall, Ontario
May 15, 2003 7:00 p.m.

<u>Mandate</u>

Q1: Do you think there's something in our mandate that would allow us to request a concurrent review of the institutional regulatory structure associated with water level regulations?

A1: *Obviously, this would have to be through either the members of Parliament or the members of the U.S. Congress to request such a study. In the Edmonds Report, there are many recommendations in there, and it discusses decision-making processes. We have had a great deal…probably the biggest problem that most residents that I know have is the decision-making process itself, that sometimes it takes far too long for something to happen. (PIAG - Dalton Foster).*

The Edmonds Report is a medium (?) report and it's a good one, it doesn't relate in any way to the Boundary Waters Treaty, it relates to the orders and the structure for the Board and the committees that support the Control Board. And it is not going to be ignored; the Commission itself is going to look right into the actual structure for regulation as well as the plans and the criteria. That's what we're doing in this Study, and we're using the very best experts that we can find and we're using airborne lidar for getting digital elevations models of different specific areas that are needed to be studied. (IJC liaison - Tom McCauley).

We are looking as best we can at Lake Ontario and the St. Lawrence from the environmental standpoint. We've taken an approach of trying to map as much as we can, brought in the specialists on all aspects of the environment, but it's a big place and we need your help in identifying unique situations, unique habitats. And if it's on a geographic base or a species base, that's fine (Environmental TWG - Brad Parker).

Q2: I am a Mohawk from Kahnawake, I'd like to know what the Joint Commission's view is on protecting and restoring the environment as far as the shoreline is concerned?

A2: *When I look at the Study program that we have, what we're trying to do is protect the environment, from the Environmental Technical Work Group standpoint. There is a linkage from the environment to people's uses. In specific areas, Kahnawake or Akwesasne homelands, we're working as best we can with people from those areas and really classifying them as unique. They are not like other sections of the River, let's spend some effort on that, let's put the study sites onto those lands and, if possible, take the specialist information that we collect from all around the lakes and extrapolate to those locations. (Environmental TWG - Brad Parker)*

Seaway expansion

Q3: What kind of effect will the expansion and dredging of the St. Lawrence Seaway have on further lowering the water tables that we presently have in our area?

A3: *The navigation study by the Corps of Engineers has not gone on to the feasibility phase. What happened was that they were asked to go back and to baseline the system, the current system as it is, the current Seaway, environmental as well as economics, and so they've got about two more years of doing that, and we won't know until they enter into the feasibility phase, which will be two years from now, more or less. (IJC liaison - Tom McCauley)*

Q4: I'd be interested to know if you know something more, in two years, they might come back with another stab at a feasibility study (about the St. Lawrence Seaway expansion).

A4: *The terms of reference for the new study, which is not done only by the Corps of Engineers, but also conjointly with Transport Canada, has just started to develop the terms of reference and it's not really clear what they will study. But for the people within the industry, it's kind of clear that we're not hoping for any major dredging or any big projects. We have ship owners who have just built ships, brand new ships for the next 15-20 years based on the actual Seaway size, so that'd be very unlikely that they would go to further dredging now. And on top of that, the Seaway is actually used at about 60 percent of its capacity, so the main concern is certainly to increase to the use of the actual Seaway (Commerical Navigation TWG - Anjura Langevin).*

It is something solely being undertaken by the Corps of Engineers and its counterpart in Canada at this point and it is not far enough along for us to get seriously involved, and it has no relationship to this Study here. If it does go forward at some point, presumably the work that is being done in this Study will be part of the baseline for that study (IJC liaison - Russ Trowbridge).

Transport Canada has joined…and it's not just the Army Corps of Engineers, it's the equivalent of Transport Canada in the U.S. Department of Transportation. And the two of them, along with the Army Corps of Engineers,

will be doing this two-year baseline study together on the Seaway (IJC liaison - Tom McCauley).

Low Water Levels

Q5: It's spring, it's runoff, can anyone answer me why the water tables in my community have gone down rather than up this spring? And we're at an all-time low, it's actually lower than it was last October. The only thing we can think of is people are holding it or people are diverting it. But we're talking like 4.5 feet (1.37 meters) lower than it was exactly this time last year (water levels of Lake St.Louis).

A5: *Certainly, the level of Lake St. Louis for this time of year is quite low. I think right now, it is higher than it was, say, last fall by maybe a foot (30.48 cm), at its lowest. But nonetheless, it is very low, and basically it's because the outflows from Lake Ontario are very low because the supplies coming into Lake Ontario are very low. As well, the Ottawa River flow this year has been…I don't know what the percentage is, but very much below normal as well. So the water coming into Lake St. Louis, most of it comes from either Lake Ontario or the Ottawa River, and with both of them being very low, the level of Lake St. Louis is going to be low because there is no control, there is no artificial control of the outlet, it's just the sill, the bottom level of the River there that controls the outflow from the Lake. So if you have less coming in, the level of the Lake drops. And quite naturally, I mean, it has been lower than that naturally in the past, in the distant past (Hydrologic and Hydraulic TWG - David Fay).*

In the fall, we were obliged to release water from Lake Ontario in order to get minimum levels on Lake St. Louis, and this time we are about a foot (30.48 cm) over this minimum level (Study Board - André Carpentier).

Comment

The fact really is that there's a minimum draft in Montreal Harbour and a certain buoy number. It doesn't take a Corps of Engineers to figure out that if you have a minimum draft of 26 feet (7.92 meters) and you dredge the buoy, you still have 26 feet (7.92 meters) at the buoy. Why couldn't that minimum water level be in relation to sea level? That way, people can't play with the water table and the levels.

Niagara-on-the-Lake, Ontario
Afternoon Roundtable Discussion
June 18, 2003 2:00 p.m.

Control

Q1: One year ago, the lake levels were rising rapidly as Lake Ontario responded to a significant rainfall in a short period of time. Earlier, the St. Lawrence River Board of

Control had decided to store extra water on the Lake but then determined to reduce storage and released water in May/June. Subsequently, the climate changed to a very dry period and levels started to drop prematurely. We must realize how quickly the system can react depending on climate conditions in the Great Lakes Basin. Considering this scenario, how much control does the Control Board really have?

A1: *Eighty-five percent of water into Lake Ontario comes from the upper Great Lakes and there is no control over that. What we can control is the outflow from Lake Ontario, which can influence the decisions made by the Control Board. (U. S. General Manager - Tony Eberhardt)*

Q2: If the normal fluctuation is four feet (1.22 meters), what is the deviation?

A2: *The existing criteria have an upper limit and lower limit built into the Regulation Plan, which is built around a four-foot (1.22-meter) range. The Control Board does not try to maintain levels to be that four-foot (1.22-meter) range, they simply try not to exceed the upper or lower limits. The average seasonal variation on the Lake is about 18 inches (45.72 cm) from the highest water level in late May/early June to the lowest level in the fall but within that 18-inch (45.72-cm) range is a four-foot (1.22-meter) window to stay within depending on incoming supplies. With a lot of rain the 18-inch (45.72-cm) range would be higher but still within the four-foot (1.22-meter) window. (U. S. General Manager - Tony Eberhardt)*

In response to any impressions that the Board controls levels in an adhoc manner, Plan 1958D that is followed was set up to match criteria along the system and to match seasonal changes. The Board only deviates from that Plan when critical needs arise in the system. The presentation displayed the amount of leverage available for deviation. If a holdback of 2 cm (.79 inch) within a week occurs, which is approximately one tenth of a full discharge, it would not be wise to go above or below certain levels because the impacts are known. The Plan is being followed. The Study is looking at all criteria to improve the plan. (IJC liaison - Tom McAuley)

Q3: Information indicates that the Plan has been deviated from over 50 percent of the time. Comments?

A3: *That number has taken place over the years and could have been a deviation of 36 hours in one week, counted as a week deviation. (IJC liaison - Tom McAuley)*

<u>Healthy System</u>

Q4: The last slide said we must ensure the health of the system. How do we know the system is healthy? We are looking at a number of criteria, which can be conflicting. What are we aiming at for a healthy system?

A4: *From an environmental perspective, more fluctuation to create higher highs and lower lows to bring wetlands back to pre-regulation status with habitat abundance and little adversity. (Environmental TWG - Rob Read)*

Q5: So, the ultimate goal is an environmentally healthy system?

A5: *There are other interests. As addressed by David Suzuki, we need better performance indicators as a way of measuring a healthy system. From an environmental perspective, more productivity in the marshes and wetlands and biodiversity is an indicator of health. Economically, in the context of commercial shipping and hydropower, there is a difference. The current regulation plan does not address environmental or recreational issues. It focused on concerns over 50 years ago but many things have changed and new measures of performance and health are needed to provide a better balance between the various issues. (Study Board - Doug Cuthbert)*

Competing Needs

Q6: Is there a certain order for any competing or conflicting needs for Lake levels? Does any one group dominate Lake levels? Are politics involved? How do we deal with competing needs?

A6: *We are tasked with looking at changing the regulation plans and the criteria. To identify if the proper criteria are being used, we are using performance indictors for all interests. Where balance is needed, different sets of criteria are being evaluated. A lot of performance indicators will be used to help choose the criteria needed to evaluate the various regulation plan scenarios that will be examined. (Plan Formulation and Evaluation Group - Wendy Leger)*

Q7: Does anyone have a stronger voice? Is everyone on the same playing field?

A7: *We are trying to develop a shared vision model. All interests will have performance indicators and each interest will provide important input into the overall decision. The "Pizza" model was demonstrated to illustrate another perspective on the formulation and evaluation of the plan. The basic message portrays a team effort to examine various preferences, to test different combinations, to consider some trade-offs and to choose the preferred solution. In the end, with some compromises, a new plan is possible. (Plan Formulation and Evaluation Group - Wendy Leger)*

Water Quality

Q8: In terms of water quality, the Toronto shoreline has a severe algae problem. Is there an answer for that?

A8: *A literature review was commissioned indicating that it is difficult to establish relations between water quality and conditions. (Environmental TWG - Rob Read)*

This is one concern being examined by Water Uses Technical Work Group, in terms of identifying causes due to water intakes that may influence the growth. (U. S. General Manager - Tony Eberhardt)

The view is that there is little impact on algae growth from the change of water levels. Concerns down River relative to changing flow volumes where the intakes are located have been minimized. (Study Board - Doug Cuthbert)

From a recreational boating perspective, it is identified as a factor because with clearer and warmer water algae becomes a safety issue. (PIAG - Al Will)

Water quality problems in the near shore area are not unique to Toronto. The Halton shoreline is also seeing that. The system is able to produce algae. Wastewater treatment plant outfalls and surface runoff from watersheds into the Lake may be trapped by a thermo bar creating a condition near the shore different than in the Lake. The relation of water level fluctuations to shoreline concerns is complex. Research continues. (PIAG - John Hall)

Q9: Is there a similar situation on the U.S. side?
A9: *Unsure, but any information will be shared. (PIAG - John Hall)*

Expectations

Q10: If the overall goal is to preserve and maintain the overall health of the system, are we putting too much weight or expectation on the Study into the regulation plan?
A10: *Fifty years ago the priority of interests did not include the environment at all. We are trying to re-establish priorities to address current issues. We will not be able to reach pre-regulation conditions but we will strive for the best through the modification of existing regulations. Balance is delicate. (Study Board - Doug Cuthbert)*

Currently, there are 10 criteria within Plan1958D. In the first draft of this Study, we are looking at 45 criteria. Two include allowing the Lake to flood every 25 years and then having it go down below chart datum levels roughly every 25 years. However, this may be too extreme and details are being investigated. (U. S. General Manager - Tony Eberhardt)

Q11: We know we will have the best possible regulation plan but will need additional tools that are complementary to make things work better, i.e. wetlands and setbacks for vigorous growth. Comments?
A11: *The activities that put these ideas in place are not within the IJC mandate. The IJC can only make recommendations then the governments are responsible to make the change. (Study Board - Doug Cuthbert)*

The bottom line of the Study is that we are trying to produce benefits to the system without putting anyone at a disadvantage from their current position. Seasonal benefits or communication can be considered but nobody will be seriously disadvantaged. (IJC liaison - Russ Trowbridge)

Results of the Study will provide information to be shared broadly with the public. The open process is a good example to address other issues. A wide network of expertise is a unique benefit to the Study. (PIAG - Sandra Lawn)

Q12: A one in 25-year reset of the system should be considered as a valuable proposition and world-class opportunity. Nature is the best place to copy. Ideally, a quasi-natural low should come first where wetlands frozen down every 25 years are very viable for high production. A wetland is a moving growth and cannot go backwards into the flood system.

A12: *It is a criteria open for negotiation and is being considered. (Study Board - Doug Cuthbert)*

A winter freeze-out will do certain things to the system but we must realize that submergent vegetation needs to regenerate. Things need to germinate on the mudflats. If kick-starting every 25 years, details will need to be well thought out. (PIAG - John Hall)

The ultimate decision will be made by the IJC. (PIAG - Sandra Lawn)

Q13: In terms of prediction, if we were to take levels from today as the starting point what could we expect if levels were going down, and if levels were going up? As a riparian owner, flooding is a concern. There is potential for damage. Both high and low water situations have been experienced. Beaches have been seen where never viewed before.

A13: *We are trying to get a measure of Lake elevations and trying to establish elevation thresholds. Data collection continues. Various regulation plan scenarios will be presented, which will likely contradict some interests. Regulations will aim to please various interests and to provide some balance. (Study Board - Doug Cuthbert)*

Q14: People need the opportunity to prepare. Informing the public and stakeholders is important. Comments?

A14: *Agreed. Slight changes can create huge impacts. (Study Board - Doug Cuthbert)*

<u>Shoreline Property Owners</u>

Q15: How will property owners be affected and how will individual concerns be addressed apart from the public open houses? People directly affected should have an opportunity to provide direct input. Will social impacts from any changes be measured?

A15: *Survey work is done. Data collection by remote sensing is underway to evaluate erosion and shoreline damage scenarios. Impacts and severity from highs and lows, winds and waves and flooding are also being studied. Individual properties have not been surveyed. (Coastal TWG - Ralph Moulton)*

Floodplain mapping exists in the Hamilton area. Building codes and zoning bylaws normally account for flooding issues for shoreline property. In the end, anyone too close to the natural lake system will suffer. (PIAG - John Hall)

In the communication plan for next year, the PIAG will hold 15 public meetings around the basin to present information and regulation plan scenarios so

opportunities to offer input will be provided well before the end of the Study is near. The website is also available. (Study Staff - Michelle Tracy)

Comments

C1: Jean Williams displayed an assortment of photos from 2002 to illustrate the shoreline at different times of the year at the Rattray Marsh in Mississauga. As a working marsh with a natural stone barrier at the outlet, fluctuating water levels create problems. For example, too much water builds pressure and washes away the barrier. With low lake levels and no rain, the marsh takes a long time to build up then when it does rain it will rush out to Lake Ontario exposing mudflats where vegetation grows in. If Lake levels were significantly higher for long periods of time, the floodplain could also be a disaster.

C2: A healthy system is a system that is self-sustaining with little interference or intervention from humans. It seems that all the natural systems come last. We need to be realistic and we must ask what biological communities are possible with minimal intervention. We may need to build dykes to mimic the required fluctuation since the systems are not replenishing themselves.

C3: Environmentally speaking, the closer we can get back to where ecosystems can operate on their own the happier we will be.

C4: The Study includes a number of referenced wetlands around Lake Ontario and throughout the St. Lawrence River. The Environmental Technical Work Group is working on criteria and performance indicators from these referenced sites to judge a plan against. Cootes Paradise Marsh is the biggest marsh in the western end of Lake Ontario and is significant to the ecosystem of Lake Ontario. The Royal Botancial Gardens is examining the water level regime to identify water levels needed to improve conditions. Fluctuating conditions are desired. One of the major principles is to strive for pre-regulation conditions.

C5: Climate change is an important part of the Study. Hydrological scenarios and models are being studied. Results could be robust.

C6: Changes to the Regulation Plan will not solve all problems.

C7: Governments must take an active role in shoreline management for proper control.

C8: Waterfowl is being studied mostly in the lower St. Lawrence. Wetland bird diversity performance indicators are also being studied.

Recommended Performance Indicators

It was suggested that waterfowl food, waterfowl production and annual migratory waterfowl usage be added as performance indicators.

Niagara-on-the-Lake, Ontario
Evening Meeting
June 18, 2003 7:00 p.m.

Water Intakes

Q1: The mention of 15 agricultural water intakes seems to be a small number. Comments?

A1: *That was an early representation. We do know hundreds exist. If you are aware of any additional industrial or agricultural water intakes, we would be pleased to hear about these. (IJC liaison - Russ Trowbridge and PIAG - Larry Field)*

Plan 1958D

Q2: According to the basic "pizza", what is the date of the original plan and do you have any comments on the plan?

A2: *The current regulation plan referred to as 1958D has been in place since 1963. The deviation is when the Board of Control has some discretion to diverge from the plan as needs arise, like shipping for example.*

Q3: It appears that deviation occurs about 50 percent of the time. Comments?

A3: *We have to remember that Plan 1958D was developed mainly to deal with shipping, hydropower and shoreline communities. (Plan Formulation and Evaluation Group - Wendy Leger)*

The Study is important and will now incorporate new information, including the environment. (PIAG - Sandra Lawn)

The rules were established 50 years ago. Deviation occurs because not all interests and demands are being met. The Plan needs to better suit current conditions so the Commission has asked that the Plan be reviewed and changes be made. (Study Board - Doug Cuthbert)

Q4: Can you provide comments on the current range?

A4: *When the Seaway was built, variations were considered too diverse to meet some of the demands so one of the objectives was to reduce the variation of levels to keep within a four-foot (1.22-meter) range. In comparison to water supplies recorded 50 to 60 years ago, water supplies now are more extreme so the Plan has been unable to attain the limit of the four-foot (1.22-meter) range. Levels are not always suitable for all interests so now we are trying to come up with a better mix. (Study Board - Doug Cuthbert)*

Erosion

Q5: When I bought my place dams were not in place. In the spring, water would rise and in the fall it would go down very low but I had 70 feet (21.34 meters) of sand beach,

which protected against erosion. Now, the beach is washed away and I get all sorts of erosion. My place is a sea of mud almost all the time. The Lake is not pleasant to swim in. Fish and wildlife cannot live in the mud and cannot handle the silt. Erosion has created a terrible problem for the environment and for the recreational community. Millions of acres of land are going into Lake Ontario due to water levels. So I am concerned with how that dam can be built in the future. The dam was built incorrectly. Long-term thinking is important. Why are we damaging Lake Ontario? Perhaps the canal should be dredged to get ships through. Comments?

A5: *Erosion is a concern for many property owners along the shoreline and has caused many problems for people losing their land. Clay can cause sedimentation and erosion, which the fish do not like. We are trying to evaluate the amount of erosion under various conditions and the impact of controlled water levels. (Coastal TWG - Ralph Moulton)*

With a family cottage on Lake Erie years ago, we also experienced land erosion but recognized that we had to deal with it as a natural process. (PIAG - John Hall)

Q6: Is it your opinion that water levels do not effect erosion?

A6: *In some shorelines if no bedrock is exposed there is a view that with long-term water level variation you will ultimately continue to have erosion. In the short-term if the water level drops you will see less bluff slippage and retreat although erosion will continue under water with more rapid retreat as the water levels rise again. Rocks will help to reduce erosion. (Study Board - Doug Cuthbert)*

Ten sites along the shoreline are being studied in detail including some in Niagara. Sites with various characteristics were selected to study rocky shorelines, beaches and bluffs. Some study areas are more sensitive to water level fluctuation than others. One aspect is a quantitative assessment to determine just how much water level variations affect the shoreline. Another component focuses on the entire shoreline. The invisible part is what is happening underwater. Both horizontal and vertical erosion must be examined. Some offshore areas with rock, bedrock or sand will be more sensitive to water level fluctuation. (Coastal TWG - Ralph Moulton)

Q7: Erosion has been explained as a very complex process. Does disturbance increase from average high water levels or average low water levels?

A7: *One would expect increased disturbance with high water levels. (Coastal TWG - Ralph Moulton)*

Q8: If water levels dropped one meter, would erosion stop?

A8: *Bottom erosion occurs during storms when waves naturally scour at a lower level. Dropping the water level would only buy some time and delay erosion but it would not last. (Study Consultant)*

Q9: I have lived on Lake Ontario for 30 years and have seen the bluffs fall apart in large chunks. Waves then take this away. I believe this relates to the frost coming out of the ground in the spring along with storm action. Comments?

A9: *Even if the Lake were not sweeping that away, it would remain the same. They interact. (Study Board - Doug Cuthbert)*

Bluffs with certain geographical properties do fail. Groundwater will have an influence and a spring melt with rain will weaken the bluff. With no wave action over long periods of time the bluff would stabilize. (Study Consultant)

Property Loss

Q10: My property has a 40-foot (12.19-meter) drop. Over 30 years, I have lost 40 to 50 feet (12.19 to 15.24 meters) of property strictly through erosion from the water washing along the shore but the biggest losses are from lake levels and storms. In the 1970s we had 20 feet (6.1 meters) of beach but now sometimes I cannot walk on any beach area at all. Something has obviously happened during that period of time to remove that beach area and I am concerned. I understand that ships need to get through. We need hydropower, and recreational boaters require certain water levels; but I do believe that the value of the loss of the land is not really taken into good account when considering changing the regulation. A lot of personal property has been lost and this concern warrants proper attention. It appears that personal property is not listed as an issue. Comments?

A10: *I apologize if it appears that we are not looking at personal property as an important issue. Rest assured that common concerns of erosion, water levels and loss of personal property along the shoreline have been repeated as issues of great concern. So one of the driving factors for this Study is the question of erosion and the impact on personal property along the shoreline. It is a complex issue. When the first regulation plan went in, one of the objectives was to reduce erosion but erosion is still there, caused by the wind and waves that we cannot control. The mechanisms of shoreline erosion and property damage will be examined. Erosion happens naturally. We will be putting a major emphasis on this area of the Study. (Study Board - Doug Cuthbert)*

Shoreline Protection

Q11: I have a house on the Lake and had someone look at shoreline protection. My neighbour spent about $200K to protect the shoreline but not all people can afford this. Comments?

A11: *A lot of people have spent a lot of money to protect the shoreline. However, if you reduce erosion you reduce the sediment and reduce beach material. That whole complex issue is being examined. We are unsure though of what people are willing to accept. We need to understand a better way to regulate the process. (Study Board - Doug Cuthbert)*

Q12: With greenhouse gas effects and more evaporation, heavier storms that can do a lot of damage are expected. Comments?

A12: *Yes, there will be less ice and there will be changes that need to be addressed. (IJC liaison - Tom McAuley)*

Waterfront Development

Q13: Over the last couple of years I have noticed waterfront development along the Lake from Niagara-on-the-Lake to Oshawa. One of the problems is that while the planning process is underway, a parallel planning process is taking place in different communities. How does municipal planning and zoning fit in and interact with the long-range view?

A13: *One of the objectives of the Commission when appointing the Study Team was to involve people from the different planning groups including the Toronto Conservation Authority and municipal and provincial levels of governments to share information. The community, economy and environment are all connected although trying to make it all work is difficult. (PIAG - Sandra Lawn)*

Dredging

Q14: Controlling water levels with the dams is one thing but what about dredging?

A14: *We are not looking at dredging. Separately, there is a proposal to review the entire Seaway system to consider larger ships and larger channels. Information from this Water Levels Study will be helpful to the proposed study but no direct linkage exists. The study is in the planning stages. The three primary partners include Transport Canada, the U.S. Army Corps of Engineers and the U.S. Department of Transport. Governance of the study is being developed. The steering committee will include members from five agencies and a two-person management team to direct the study. Teams are being gathered to review the economical, engineering and environmental aspects. The study will examine existing infrastructure to determine what is required to keep it viable. (Coastal TWG - Ralph Moulton)*

An earlier recognizance study was done but two major gaps were identified. Environmental issues were not taken into account and no one consulted with Canada. (IJC liaison - Russ Trowbridge)

Great Lakes

Q15: I find that the Great Lakes are drying up. Comments?

A15: *The upper Great Lakes are all below average. Lake Ontario is above long-term average. There has been heavy precipitation and a phenomenon where the Lake went really high and peaked at the end of June when the other lakes were still low. Short-term effects in the basin need to be dealt with. (Coastal TWG - Tom McAuley)*

Pollution

Q16: What about the severe problem of pollution?

A16: *This Study will not be focusing on pollution. Water quality is a high priority but falls under another category. (Study Board - Doug Cuthbert)*

Water Diversions

Q17: Is there a process to assess water-taking from the St. Lawrence? It seems that some water is being bottled, charted to golf courses and used for irrigation. Are there pipelines? Is anything being monitored?

A17: *Yes. The federal and provincial governments and the IJC have looked at this issue. Water export and water-taking have been reviewed but are not part of this Study. Water diversion issues are addressed elsewhere. (Study Board - Doug Cuthbert)*

Q18: Does this mean it would not have an impact?

A18: *Yes. The amount of water that is consumed is monitored. Consumption is minimal and relative. (Study Board - Doug Cuthbert)*

Comments

C1: With respect to increases of carbon and other gases in the atmosphere and their effect on the climate, recorded history indicates that since the 1860s some of the warmest periods have been over the past decade. Climate change scenarios will be tested.

C2: Knowledge is powerful when it is shared.

PIAG Public Meeting
Dorval, Quebec
September 24, 2003 7:00 p.m.

Water flows

Q1: Why was the Cornwall dam opened to flows (in mid-August) that we would normally see during spring flooding?

A1: *At the time of that event, there was a power failure (August 15 blackout), so the hydro-electric stations had to reduce the flow slightly. And then, there was demand for increased flow to meet the electricity requirements that were in the process of…that were in need of a lot of electricity because they'd also had to shut down the nuclear power plants, so we were asked if we could increase the Moses-Saunders flow, which was increasing…and this was also done at the other end…on the Niagara River. We asked them to analyse the actions following this emergency or this electricity crisis because in the future, we would like them to be better prepared if it ever happens, to have better communication systems, links, people they will call, chains of contacts in place. (Study Board - André Carpentier)*

Q2: Would you clarify for me what the position of the shipping people is on how much they're losing and how much they're gaining by lowering the Lake Ontario water by a couple of inches versus gaining it in the Seaway?

A2: *Yes, we are working and we actually just started a huge study on the economic impact of the low water levels on commercial shipping. Every ship that basically is loading a cargo in periods of very low water levels will be affected by this phenomenon and will have either to wait until the water levels raise or load less cargo. So this has an impact on the competitiveness of all of the ports in the Seaway system. If the levels are repetitively low, then we have an impact on our commercial shipping and also to the industries that are related to this very important transportation way. The example you have here is in Montreal. That's the container ship they're loading in Montreal. It's not only Montreal too that's affected by the water levels. That's often the tendency because it's a bigger port, but there are also other ports on the St. Lawrence that are significantly affected by variations in water levels. And on the Seaway too, when there are very strong currents, for example, at times when water levels are very high, the ships are also going to experience delays, and there are going to be currents, and similarly, ship loading on the Seaway can be affected at times when water levels are very low (Commercial Navigation TWG - Anjuna Langevin).*

What it is basically is the deep-water side of the port, so you have 11.2 meters on that side, it's much shallower on the other side. The values represented are, if you look at the third column, you see number of containers that can be carried on an average-sized ship; fully loaded, it would be 2,800. For each two-tenths of a metre, you have to drop; I think it's 30 containers. And the value to the right is not the value of lost shipping costs, but it's the average value of the cargo in those containers. So that's what you're looking at. But the important factor is that it does show a need for additional ships when values are loaded (?), but that's only going as far as the Seaway…the ocean side of Montreal. (IJC liaison - Russ Trowbridge)

<u>Climate change</u>

Q3: Does the Study consider the problem of the water level dropping with the climate change speeding up? There could be a possibility to take the entire hydro system into consideration when we want to ensure a particular water level in Montreal and a particular water level in Cornwall. And are we actually preparing for the possibility of climate change accelerating, or only talking about it?

A3: *The answer is yes. In the fancy simulator that I showed you at the end, we're going to simulate extreme conditions—conditions that have never been seen before in…the hydrological or hydraulic data, we will simulate extreme situations that will factor in climate changes: a lot of water or complete drought in the Great Lakes. We'll have scenarios where we'll be able to answer yes, if climate change causes drought, we'll have this condition or that problem with managing the system. Some Canadian experts and some U.S. experts are working on that and they're going to be using, among other things, four of the best models. The Joint Commission hasn't had any information about these models since 1999. So, we're updating everything, but we're also using the new*

model from England, the Hadley 3, and we'll be able to project water levels. (PIAG - Marcel Lussier)

Q4: The RUSL (Regroupement des usagers du Saint-Laurent) worked hard over the past year to survey a number of people who represent various users of the St. Lawrence to identify how they have been impacted over the last few years during periods of extremely low water levels—there were several periods in our region—and also to discover the adjustment measures the people took when this occurred, or what they think should be done if we had the opportunity, and also the water requirements. The zone is already at risk, since at chart datum, or below chart datum, most uses sustain considerable damage in the St. Lawrence. There is a comfort zone, but it is at least 30 to 60 centimeters (.98 to 1.97 feet) above the chart datum, this datum was calculated based on the level at the city of Montreal.

A4: *I would like to comment from two standpoints—the Board of Control and the Study Board. With respect to the Board of Control, when you say that you drew some conclusions, I think everyone is entitled to make their own conclusions, but I must say that in the Board of Control the demographic weight isn't greater on one side or the other, and of necessity, the ranges are more evident upstream than downstream. When the flow is increased or decreased, the impacts on Lake Ontario are different from what they are on Lake Saint-Louis, and this is nature's doing. Lake Ontario, as its name says, is a lake, while the St. Lawrence is a river. This makes all the difference, and this is how we can use it to increase flow—so we don't have a major impact on Lake Ontario—since we can reduce it—so there's no impact and there would be many, many benefits for both sides when we decrease and increase. (Study Board - André Carpentier)*

The Joint Commission is well aware of the St. Lawrence, and since the beginning, from the formulation of this Study and the planning of this Study, the St. Lawrence has been considered; it hasn't been forgotten. And now, the participants of the Study include representatives from just about everywhere: the Quebec environment department, Environment Canada and the St. Lawrence Centre in Montreal and Sainte-Foy. Also, the Public Interest Group now includes representation from the ZIPs, the Priority Intervention Zone committees along the St. Lawrence. So, it's not forgotten. This is why the effects of dam regulation disappear around Trois-Rivières, and we study up to Trois-Rivières. They're not major, but there are effects there, nevertheless. (IJC liaison - Tom McAuley)

Q5: In the last response, the speaker talked about integrated management of uses, among other things, and one part of integrated management in a decision-making process like this, is plan development, which is time-based integration. I'd like to know about the work that's going on to develop the future water regulation plan. How is this issue being handled? And secondly, within the context of climate change, how does the IJC plan on creating a master plan that meets both short-term and possible long-term interests?

A5: *The plan that'll be proposed will take into account short-term issues and will also look at possible effects if we had very, very major climate change, at the highest and lowest extremes, and this plan has to be able to meet these conditions. So, will we be able to find one? I think this is the challenge of the Study. But the proposition that will be made will have to respond to these concerns in the short term as well as the long term. But I think it's a very, very big challenge. (Study Board - André Carpentier)*

Q6: The people talking about climate change were saying that we're in a period of low levels, and it looks to me like we're in a period of high levels. But what we see and what we're told about climate change is that we're seeing unusually low levels? Do you have plans to educate the public about the forces affecting the River and the actions you are taking? Because people will draw conclusions based on what they see, and this can be far from reality.

A6: *Declining, since 1999. There was an increase after water came in from Niagara Falls. This was water coming from Niagara Falls. The low levels start to show at the end of the graph; it's 1999 that is shown on the graph. It's high compared to the rest but also it's declining drastically. And yes, there are plans; it's a communication plan. We showed you that we're in the third year of studying, the studies are being completed, and so we will have the technical material in our hands soon. All the technical studies will be completed in 2004, and people will then distribute these documents to the public and will create a relationship with the public, with scientists, with the community or people who are interested in the various issues. The levels of the River were high until 1999. They have been declining since (PIAG - Marcel Lussier).*

It's not necessarily representative of the trends because over 30 years…there's one and a half times since we started to regulate. And the mark we made, after the project, before the project, seems to imply that there've been changes since then, and that's not the case. It's just a mark showing that regulation started then, but it has nothing to do with the water coming in (Study Board - André Carpentier).

To follow up on the previsibility, the forecasting capability that we may or may not have with respect to water levels and flow, we have the prospect of climate change, and this is something that will most likely happen within our lifetime. 2030 is not very far away. And of course, we have seen in the past periods of very low levels in the 1930s, in the 1960s, in the 1990s. We are in the middle of a very bad stretch. And if you look at the last five years of discharge in the Montreal area, we've had totally bizarre, erratic patterns. Well, the point is and the question is, the million-dollar question is are we going to go back to higher levels in the future, back to the levels of the 70s, where everybody was complaining that there was too much water in the system? The question is…that we are facing is how ready are we collectively to go through those hard times? Because there will be hard times, because we need water for drinking, we need

water for economics, for the navigation, we need water for the environment. (Environmental TWG - Christiane Hudon).

I think that for some interest groups especially, the question of forecasting, but especially in the long term, is very…in the short term is very important. For sure, the effect of climate change is really going to affect us, but we're talking about adjustment measures, having better forecasts could well make it possible to reduce some of the effects. So these are things to consider. The Commercial Navigation Group is really going to have to look at the economic impact also in terms of the discrepancies due to a lack of accuracy in the forecasts. So in fact this is going to increase the effect of low water levels when the forecasts aren't as accurate. And for sure there are costs related to an increase in the accuracy of the forecasts, but I think these are things to think about (Commercial Navigation TWG - Anjuna Langevin).

Priorities

Q7: I was wondering if the International Joint Commission has decided to establish priorities for different uses in its management of water levels and, if this is the case, what are the uses it has identified as priorities? In this context, would it not be important for environmental use to have priority over other uses? And one of my concerns is that if we do not state in the regulation plans that the environmental usage of water is prioritary, and then, there is a chance that the legislation will be seen as not trade-neutral and will be seen as aimed at protecting industries and commerce rather than being primarily aimed at protecting a natural resource.

A7: *All the aspects were considered in the Study, and all interests will be taken into account and will be analyzed by that fancy model that will simulate different plans. So, no one interest will be preferred over another. (PIAG - Marcel Lussier)*

We had a session with our legal advisors approximately four months ago, five months ago, as to how tightly they would have to follow the Article 8 priorities: drinking and sanitation water uses and also navigation, then also hydropower and irrigation. And the result was that the Treaty also says that we should indemnify other users such as the environment, and that one country cannot pollute the waters that would affect or impact the other country. And so we can't really give you a clear answer now…at least, I'm not speaking for the Commission, I'm just speaking as an engineering advisor, in my limited understanding. (IJC liaison - Tom McAuley)

Q8: The legislation that will be introduced to manage the water levels of the Great Lakes could possibly be contested before either the General Agreement on Tariffs and Trade or the North American Free Trade Agreement decision makers. It's important for the Commission, in managing the different uses, to take into account the fact that setting priorities could potentially have a major effect on the

validity of these plans if they ever had to be defended before the General Agreement on Tariffs and Trade or the North American Free Trade Agreement.

A8 *I'd like to request that you give us some of that good information and pass it on to Michelle at the office in Ottawa. She'll make sure that the Environment Group gets it. I think it's an excellent point (PIAG - Elaine Kennedy).*

This Study only deals with water levels going through the system. It does not have anything to do with how the water is used. Secondly, on the issue of whether this could be subject to challenge under World Trade Organization, the only issues that can be challenged are those where national treatment is not accorded to other members within the World Trade Organization. And national treatment applies here because even within the United States and Canada, water cannot be taken out of the basin, and that is prima facie evidence that it is being used for water conservation. (IJC liaison - Russ Trowbridge)

Q9: In the performance indicators, I seem to remember seeing for some indicators that they wanted to determine the dollar value of damage caused or of advantages found. I saw it for boating and hydro-electricity, maybe others: Erosion. How does the Commission plan on measuring the importance of environmental damage or environmental advantages of the plans? And, in particular, is it going to be done by monetary value, and if so, how does one calculate the monetary value of environmental damage for the Commission?

A9: *We were very concerned about the economic indicators and dollar amounts on a number of uses, and this, we can easily understand that we can count damage in terms of erosion or economic contributions. This is completely normal. But in terms of the environment, for a long time we've made it known that we don't want to come up with a dollar value, but at the same time, we can't treat the environment like it doesn't have any value. On the contrary, we're trying to say that it doesn't have a price, but it's not always obvious to sell either. We recognize that the health and safety of Canadians is also important and that even the most environmentally involved person would be uncomfortable at the thought of his or her own house being flooded to save the pike and to help the pike spawn. We see these important relations, but we recognize that the St. Lawrence is an economic area, it's a home, it's environmentally important and it requires everyone to co-exist. We are much more aware of the environment, and the IJC's willingness to have the environment involved in the development of the regulation plan. So, in terms of the environment, too much is the same as not enough. Too much fluctuation is as harmful as not enough fluctuation. A flood in January or in August isn't a good thing. Floods have to happen in the spring. Low levels have to occur at certain times of the year. So, there are abrupt changes in the environment, and we're working on that. We want to be able to determine relations so we know what to expect. And at the Environmental Technical Work Group, we have always been reluctant to put a dollar value on the environment.*

Level limits

Q10: Has the management plan since 1958 increased the amplitude of the upper and lower limits for water levels in the River?

A10: *Personally, I don't think so. The plan lowered the ranges for Lake Ontario—this was one of the goals—but nevertheless, it did this over a period of time and not automatically, each time that we…So, the plan makes provision for storage one time and a reduction another time. So, during extremes, maybe we had some events that showed levels lower than what we would have seen if there had been no regulation, but never lower than if…at the extremes. So, during annual extremes, there were maybe some areas, but we can't benefit sometimes and not suffer a little sometimes. But during the extremes, I don't think anyone suffered. (Study Board - André Carpentier)*

Q11: On October 14, around Lake Saint-Louis, the public will be consulted on a very specific subject: vulnerability and adaptation to extreme variations in water levels, such as how people made it through, how they adapted, how they plan on adapting. A 23-centimeter (9.06-inch) increase in Montreal versus a 23-centimeter (9.06-inch) decrease, yes, I saw the vulnerability aspect. How will we weight it, and I think this is also the challenge, the weighting, to see what can be considered a vulnerable sector. Is it only the economic sector; is it the environmental sector; is it marinas, small users or large users?

A11: *The problem is fairly obvious here between Lake Ontario and the St. Lawrence River, that was mentioned earlier. Lake Ontario has a large surface; the St. Lawrence has a small surface. So, it's hard to have a complete balance between the two. Between Lake Ontario and the St. Lawrence River, there will always be larger fluctuations in the River; it's a question of geometry. St. Lawrence River no longer exists between Valleyfield and Beauharnois. It could be used as a second reservoir that could be used as a valve…which could drain into Lake Saint-Louis during low-level periods. (Unidentified man from the audience).*

First of all, the River is not exactly dry. I must say that the River, considering that the water was diverted to the Beauharnois canal, five structures were created, which formed pools creating a new reservoir that would store this water is not realistic. This would cause a lot of flooding, and it's not a solution in my opinion. It's true that now there's less water going through the St. Lawrence River; however, there's a large hydro-electric plant nearby that produces a lot of energy, 12,000,000 megawatts/hour per year, which, if they were not produced with water, would probably be produced with petroleum, a dirty fuel, climate changes, there're all sorts of environmental phenomena that aren't necessarily better than having a hydro-electric plant (Hydroelectric Power TWG - Sylvain Robert).

Comment

C1: If you consider that 90% of the River flows into the canal, the remaining level of water isn't high.

R1: *The impact on Lake Saint-François lasts only three or four hours when there's an increase at Moses-Saunders. And what they're doing—actually, this is why the lake's water level is almost always constant—is that the water passes through when it arrives. And this lake is much larger than the canal, so the part located on the right or left, depending on which side we're looking at, wouldn't be enough. It'd only be a small reservoir that would, I think, be a lot smaller than the three hours we have on Lake Saint-François (Study Board - André Carpentier).*

Appendix F

International Lake Ontario-St. Lawrence River Study

Questions and Answers from United States Public Interest Advisory Group Public Meetings

April 1, 2002 – March 31, 2004

Sackets Harbor, New York
Afternoon Roundtable Discussion
August 8, 2002 2:00 pm

Q1: Does the Study look at outflows through other areas than the St. Lawrence River, like the Oswego River?

A1: *Everything else is so small compared to the St. Lawrence. It has the second largest flow of any river in North America, second to the Mississippi. (PIAG – Dalton Foster)*

Q2: Is it true the Ottawa River free-flows into the St. Lawrence? Are there no controls?

A2: *It isn't only a free-flow; there are more than fifty dams there, but there is no regulation plan right now. (Study Board – Andre Carpentier)*

Q3: From time to time, we hear about water transfer out of the Great Lakes and into other areas. It seems to me that we should be studying this even though it complicates all businesses. Is that being studied?

A3: *That is not part of our mandate, but other groups, such as the IJC or Great Lakes Commission, are looking into the issue. (U. S. General Manager – Tony Eberhardt)*

Q4: A concern that I have is that the Study is going to be for five years if it's funded fully. It will probably take a few years after that for implementation. What could be done to make the current St. Lawrence River Board of Control more agile? Do they need more tools? Do they need more full-time employees?

A4: *There is a River Board of Control meeting in September that everyone here should attend to learn more about their procedures. (PIAG – Sally Sessler)*

Q5: How is the final control of the River made? It seems to me like some fellow is sitting up there at the dam site with a push button that has hydraulically active actuators. What's the whole chain of command before that guy gets the message and says open the gate? How many committees or offices does the command have to go through? Does this delay a response to certain needs?

A5: *The system is extremely complex with many different needs being addressed including the natural cycle and the needs of various interests in both Lake Ontario and in Montreal. As far as the delay, we can't act instantaneously because we never know what the long-term effects will be. Every Thursday, there is group called the Operations Advisory Group; they're the ones who control the output through the dam. This group meets weekly to determine if the current regulation plan should*

remain, or if certain deviations are temporarily needed. The flow is actually changed on Friday nights. (Study Board – Andre Carpentier)

Comment

I have been involved with the system for many years and have done studies about what shoreline property was like before the Seaway was built. The people who built their houses on the shore are the only ones responsible for the conditions. It's not the fault of the IJC; it's not the fault of the Control Board. At this point, there is only one word that is significant to those people who built their houses where they shouldn't. I think I call that stupidity.

Q6: With the Technical Work Groups concentrating a lot on uses like boating recreation, navigation, that sort of thing, what actual waiting will the environmental issue get in the final analysis when everything comes together?

A6: *That's going to be one of the hardest and biggest decisions to be made. The Plan Formulation and Evaluation Group will start making those kinds of decisions, but with our input. A lot of it is economics, and you can't put a dollar value on environmental issues. That's going to be one of the biggest areas where the public needs to be involved. (PIAG – Elaine Kennedy)*

Q7: What impact, if any, is the current study being done by the Army Corps of Engineers going to have on this process?

A7: *That Corps study is about changes in the size and scope of the St. Lawrence Seaway – about expanding or decreasing the Seaway. Our Study is completely independent and looks at outflows from Lake Ontario and the St. Lawrence River. We're not considering any changes to the Seaway. What we're coming up with is a new regulation plan. (U. S. General Manager – Tony Eberhardt)*

Q8: Does the Study include wind direction or velocity? It is perhaps the most significant problem that people have along the Lake in the winter.

A8: *Very much. That's actually one of the most important driving forces of a model. (Coastal TWG – Tom Bender)*

Sackets Harbor, New York
Evening Meeting
August 8, 2002 7:00 pm

Q1: I am a pilot on the Seaway and heard you speaking about the daily outflow on the River. Is it possible to get that information out to the Seaway entities on a daily basis for our access?

A1: *The Operating Advisory Group meets weekly to determine the planned flows for the coming week. You can contact the Board of Control, their website, or your local contact on the Seaway for the flow information. (Hydroelectric Power TWG – John Ching)*

Q2: The Army Corps of Engineers is doing a reconnaissance study right now looking at the possibility of a major expansion of the Seaway System. If this upgrade is done, it seems the work of the Public Interest Advisory Group is all being done for naught, and I'm not sure if this Study should proceed until the Army Corps finishes their reconnaissance study.

A2: *This Study is a relatively short-term study to be completed in five years and implemented shortly thereafter, whereas the large navigation study is decades down the road; they have not yielded concrete information yet. (Coastal TWG – Tom Bender)*

Q3: Is there any way that we can have better control of the levels and outflows around the lakeshores in Rochester?

A3: *That is what the Study is trying to do, to establish outflows that the public wants. (PIAG – Sally Sessler)*

Q4: I am wondering what the outflow is right now? We had high water at the beginning of the season and now it's dropping too fast. We're just holding our breath to see if we get through the summer.

A4: *The flow this time of year is 8,200 cubic meters per second* (289,580 cubic feet per second)*, and the level is going back by six or seven centimeters (2.36 or 2.76 inches) a week right now. This is all affected by what we get by way of precipitation. (Study Board – Andre Carpentier)*

Q5: All the water that is let out, is it being dumped or is it used for electricity?

A5: *Water is let out for generating, commercial navigation, and so that the water downstream and on the lake have good levels. (Study Board – Andre Carpentier)*

Q6: Does this water leave through floodgates or a regular dam?

A6: *Normal dams. . (Study Board – Andre Carpentier)*

Q7: Does the Joint Commission on regulation listen to the Advisory Group?

A7: *The PIAG is telling them what the people want. It is up to the Commission to decide if we have an impact on them. (PIAG – Dalton Foster)*

The Study Board will come to the International Joint Commission with recommendations, and I think we're all committed to renewing these orders, and getting the best out-flow plan there is for the people around the basin, and for the environment of the basin. It's not for anybody else. (IJC liaison – Tom McAuley)

Comment

I've lived at Mexico Point since the 1950s. Because of high water and erosion, we've had to move our house back three times – we're at the way back of our lot. If things get any worse, there's nowhere to go. Our deed shows the front part of our lot as being a hundred feet (30.48 meters) under water. So if somebody doesn't think the

height of the water is important, or that a foot (30.48 cm) doesn't matter, it matters a lot.

Q8: I hear an assumption that by outflow control, it is possible to stabilize the level of the Lake permanently. Is this true?

A8: *You can't stabilize the Lake at one level. It's impossible because water constantly enters the system but only so much water can be let out. (PIAG – Dalton Foster)*

Q9: Our water has been high lately. Do the power companies get special interests and more influence over the control of the Lake?

A9: *With outflows greater than 7,800 cubic meters per second (275,454 cubic feet per second), the power companies are negatively impacted because they lose efficiency on the turbines. The power companies want the flow to be steady. They would like it at 7,800 cubic meters per second (275,454 cubic feet per second), constantly but everyone knows that isn't possible. So, they don't care so much about the levels as they do about a steady out-flow and making steady power. (PIAG – Dalton Foster).*

Wilson, New York
Afternoon Roundtable Discussion
June 19, 2003 1:00 pm

Q1: Does the Coastal Processes Technical Work Group include lands that are private, public, or both? You can't do the whole lakeshore, obviously.

A1: *There are sixteen or seventeen different study sites that comprise a whole range of shoreline interest groups, both public and private. (U.S. General Manager – Tony Eberhardt)*

The idea was to take, or pick select representative sites that had unique characteristics that we thought would best represent the needs of the Study. (Coastal TWG – Tom Bender)

Q2: Is the lower Niagara included in the studies being done by the Coastal Group?

A2: *It is not a study site, per se. Once we collect all the detailed data at these representative sites, we will apply the information to every mile or kilometer of shoreline; and therefore, the lower Niagara River, of course, being fronted on the water, would be included. (Coastal TWG – Tom Bender).*

Q3: Are there any studies dealing with public beaches or the impact on public beaches over a long period of time.

A3: *Probably the best example of that would be the east end of the Lake, the Sandy Pond area. (PIAG – Tony McKenna)*

Comment

The Army Corps of Engineers was given $100,000 (U.S.) to investigate the impact of erosion on Olcott and Somerset beaches. The Niagara County Planning Department had several aerial photos taken over the years that show an impact on beaches and gave them to the Army Corps. It might be beneficial for the Study to look at.

Q4: How do riparians fall into the list of performance indicators?
A4: *That would be the Coastal Processes Group. (PIAG – Tony McKenna)*

Q5: Do you feel the IJC is going to listen to these recommendations at this time?
A5: *When they came up with the last proposal, which was Plan 1998, they realized then that the processes needed more public input. You just can't take something out the public and say, here's what we've done, and let's make a decision. So the IJC is going to be really looking to the public for input. That is why the Ripple Effect newsletters are sent out through the mailing list. We're really interested in getting more people to react, just by being on our mailing list and having that publication you can ask questions or provide inputs to us. That is why the PIAG hopes that we will get a number of people that are interested in the subject to come out to tonight's public meeting. (PIAG – Max Streibel)*

I'll just say, we've had a couple of interesting disagreements or questions between us and the Study group. And we've got access to Dennis Schornack who is the IJC Chairman on the U. S. side, who's been to almost every one of our major meetings, and he's made himself available to us. And we can talk with him if there are problems. And Herb Gray is on the Canadian side. He's the Canadian chair of the IJC. He's been at all of our major meetings. So I'd have to say, they're listening. (PIAG – Tony McKenna)

Comment

I'm glad they created this. I think it's a positive step. I think it took too long, but, and I'm still concerned and hope that the public interests get past the private interests in this Study.

Q6: Do you know where there's the most shore erosion? Is it near us, because that's what our residents are telling us?
A6: *We've seen erosion along the south shore and the eastern end. There is also erosion on the St. Lawrence River caused by different levels in the River as well as and the shipping coming through. (PIAG – Streibel)*

Q7: Does the Canadian shore have the same erosion problem we have on this side or is it because of the wind?
A7: *The northeast shore is rockier. They don't have the same problems there and the upper River isn't quite as bad because there is a lot of bedrock there. We broke the Study up into two main sectors, the Lake and upper River, and then the lower River.*

There are different processes going on in those different regions and different causes for erosion. Shipwakes are a big factor in what is going on in regard to erosion in the lower River. (Coastal TWG – Tom Bender)

Comment

I think this is terrific but I think we're going to have the same problem we always had with the general public. It's going to be a matter of education and dissemination. We're going to have to get the information out there and make sure they understand.

Q8: I have a question on procedure. Now, the PIAG will recommend to the IJC and advise them?

A8: *No. The Study Board will submit the recommendations to the IJC. We've been here all along to influence the Study Board during the process. The process will be that the Study Board will submit their recommendations to the IJC, and the IJC will probably hold hearings of their own. (PIAG – Tony McKenna)*

Q9: My concern is, based on my experience with the Great Lakes Commission, the IJC is a highly political body right?

A9: *The Commissioners are appointed by the President and the Prime Minister. (PIAG – Max Streibel*

Q10: If there is a conflict between moneymaking interests or industries that are dependent on the waterway to make money and the people living on the shoreline facing erosion, where is it going to go?

A10: *The IJC charged the Study Board, which is their representative, to pull this whole thing together, saying there are "no sacred cows." If the Study just maximizes out to shipping or maximizes out to hydropower, we don't really have a program. The Study is going to have to be able to demonstrate that all the interests, can be somewhat accommodated if absolutely feasible. Now, it may be physically impossible to do some of the things that we'd like to do, but as much as we can. You have to keep it in perspective. This whole thing got to where it was, not because of power requesting it, not because of shipping requesting it. It came as a result of you folks and folks along the south shore, the people in the St. Lawrence River, that are concerned with boating, tourism, erosion, coastal erosion, being a constant voice in the ears of the IJC. Now we have the total group in the mix. (PIAG – Max Streibel)*

Comment

I think the concern of the public is that they no longer call this Lake Ontario; they call it a reservoir. The water is patrolled up and down. It's no longer a Lake; it's a reservoir.

Wilson, New York
Evening Meeting
June 19, 2003 7:00 p.m.

Q1: Where are we in the cycle period of high and low levels?

A1: *If you look at 100 years worth of data, the last 25 years are some of the highest that there have been. It's gotten us to where we think that's normal; some people think that's normal. (PIAG – Max Streibel)*

Q2: I put 700 ton of stone, very very big stones, in along the edge of my shoreline property in the '70s. They're beginning to roll out into the Lake. Now we've got to go through the aggravation of all kinds of permits and all kinds of paperwork to get a backhoe in there and spend another $5,000 hauling them back in and towing them back in to where they were back in the '70's. Can you offer us any relief on that problem?

A2: *Our mandate is to look and see if we can make a better plan that would help maintain the Lake levels. (PIAG – Dan Barletta)*

Q3: Is the IJC biased to protect heavy industry and heavy shipping versus the property owners and the pleasure boaters? How can you balance them?

A3: *We've been assured by the IJC that all interests are being treated comparably. You haven't had public involvement to this extent before. That means if they come to coastal and say, we're going to have to sacrifice a little bit in terms of water level, shipping's going to have to sacrifice, power is going to have to sacrifice and everybody else. We're honestly going into this with six technical work groups. They're all doing their technical analysis. All this data will be made public; so it can be researched. It is going to be very above board. Anything less than that will be unacceptable. (PIAG – Max Streibel)*

Comment

C1: There's no sense going after the State and Federal governments because we'll get nowhere. I think, as a town resident we're worried about our property. A marina owner, if he's suffering from low water, he's got relief. He can dredge to get boats in and out. If your property falls in to the point that your house is in danger, you have no relief. Maybe our loss of land would be solved if we went after our town boards, and maybe they would go after the county folks and on up the line.

C2: I represent recreational boaters, and I think that plus or minus a foot (30.48 cm) is good for us. Kind of pick a level and stick with it. I realize that probably can't happen. But our boat is our summer home. It's not a simple issue for us either; dredging is extremely expensive and can cause problems. It's a safety issue too. We get to a lot of the ports throughout the Lake and even though it's a very deep lake, a lot of the ports that we would go into are dredged to six and eight feet (1.83 and 2.44 meters), so that really becomes an issue on where you can get in. If you're out there

and a storm kicks up on the north shore, it's probably about eight hours before we can get to a port that's deep enough to get in.

Q4: Does the Ottawa River have any controls on it?
A4: *They have some reservoirs, but as far as a control structure, way up stream, they really don't. (PIAG – Dan Barletta)*

Comment

We're doing all this input and the PIAG is volunteering their time because the Canadians don't want to spend a couple million dollars to put dams on their rivers so we lose our property?

Greece, New York
Afternoon Roundtable Discussion
August 7, 2003 1:00 pm

Q1: What is the difference between the commercial influences of the Lake and River as opposed to industrial influences? Which are held in priority?
A1: *The IJC has been required by treaty since 1909 to place priority on certain issues. Industrial, navigation, and hydropower were the priorities of the treaty. We have now considered other interests like the environment and technological improvements, and we continue to find new interests. (IJC liaison – Russ Trowbridge)*

The IJC will make the final decision based on the Study's recommendations. There are a lot more interests being studied than ever before. (PIAG – Max Streibel)

Q2: Are restaurants or bars on the Lake or River considered commercial establishments?
A2: *Yes, they are the same. (PIAG – Max Streibel)*

Q3: Are there any groups looking at water control on the Ottawa River? It looks like we're raising the levels.
A3: *The Ottawa River is entirely in Canada and therefore a Canadian issue. The Canadians make decisions to control the Ottawa River themselves. One factor to keep in mind is that the Canadian government does not allow homes to be built in flood zones, and therefore land operation and sensitivity to flooding are very different in Canada and the U.S. (IJC liaison – Russ Trowbridge)*

Q4: What about property owners? If I had to guess, it would look like this presentation was about raising the water levels. There are going to be a lot of angry citizens here tonight.
A4: *The Coastal group is cataloging and categorizing the shoreline. Economics will have to be a factor. It's not going to be the issue of one interest over the others. (PIAG – Max Streibel)*

The end result can't be shocking to the public. We are working to involve the public in the Study. (PIAG – Henry Stewart)

Q5: How is the Study funded in U.S. & Canada?
A5: *Funding is split between U.S. & Canada. (PIAG – Streibel)*

Q6: How would the public reject a plan or how do they decide on a plan?
A6: *The IJC's Commissioners will decide on how the Orders of Approval will be adjusted to provide the most overall benefit to stakeholders, including the environment. Public input is critical in this process, but there will not be a public vote; there are too many diverse interests to be able to determine an outcome that way, and the Commission must adhere to the terms of the Boundary Waters Treaty in any case. (IJC liaison – Russ Trowbridge)*

We'll be back next year with the different models that will be tested on different interests. (PIAG – Streibel)

Comment

Spreading the word about the Study to the public is an important part of this PIAG. The Post-It note ads were very effective. You might want to give a short video to Public Access Television (Channel 12 in Webster) that could be shown periodically. You could give it to each Supervisor's office.

Greece, New York
Evening Meeting
August 7, 2003 7:00 p.m.

Q1: During the summer, did Montreal have so little water that ships couldn't get out? .
A1: *There were extremely low levels in Montreal, but I don't know whether it was so low that ships couldn't get out. Most likely, ship movements could occur in low water if they had lighter loads to lessen the draft. (IJC liaison – Russ Trowbridge)*

Q2: I question the datum used for lake levels. There aren't enough studies being done on water levels.
A2: *That's what the H&H Group does. (U.S. General Manager – Tony Eberhardt)*

Comment

There is so much new and accurate technology to collect data about the water levels. Since the disastrous high and low levels of 1991, there have been fluctuating levels. The levels keep going up because the datum changes.

Q3: There is not enough emphasis on foreign shipping. The number one goal is to preserve Lake Ontario. The biggest threat to the Lake right now is foreign shipping.

No one is looking at it. There are only a few ships that travel a day, and these ships are jeopardizing 20% of the world's fresh water supply. Terrorists can easily attack the Great Lakes. No one is doing anything about it.

A3: *The IJC is very concerned with alien invasive species, but it is out of the realm of this Study. (IJC liaison – Russ Trowbridge)*

Q4: Why is little happening in Wayne and Orleans counties? There are no wetlands being studied, there is no erosion being examined. Why are there very few study sites in these counties? Is it because Orleans County has 45,000 as opposed to Monroe County, which is much bigger? Are study sites chosen on population?

A4: *The Coastal TWG study sites are chosen on unique characteristics that represent the whole of the Lake and River system: Historical information, geology, population, data availability, etc. (Coastal TWG – Tom Bender)*

Q5: Is there any citizen input from Orleans County that I could give to help the Study?

A5: *ALWAYS! (Coastal TWG – Tom Bender and PIAG – Max Streibel)*

Comment

How many commercial boats actually come into the Study area? I know of one cement shipper that goes into the Rochester Harbor. Others then go to Toronto or Hamilton. Boats bring goods in. We use the goods to get jobs and make money. We use the money to buy houses on the Lake. Then the Lake is destroyed by the boats.

Q6: Why do water levels peak in June and July? Why at the end of July do water levels go back down? We want the summer to be as long as it can.

A6: *There are many factors involved. It is a natural cycle. (PIAG – Max Streibel)*

Q7: In Ogdensburg, they were dumping water in to let the ships in. Shipping has a major influence on the IJC. In 1991, there was a meeting in which the IJC under Louise Slaughter only cared about shipping and hydropower. Both interests spent millions in lobbying to the IJC and got their wishes. I don't have that money so how could I win?

A7: *It is important to take all interests and divergent views into consideration. The PIAG has been working hard to develop appreciation and consideration for interaction of the various divergent interests. We need education and consensus building to have our final plans be accepted by as many people as possible. (PIAG – Henry Stewart)*

Comment

Many people (property owners) have lost land and property and paid a lot of taxes. I've had to bring huge stones in to protect my property, with my own money. At the time the water was so high. The sandbar between Charles Point and Lake Bluff was completely covered with water; now they have built property on it. Shoreline owners should be the main concern. Water, shipping, environment, and economic interests

are all important, but so are property owners. I haven't seen any good results or big effort to help the property owners. You need to consider all factors.

Q8: I have a question about algae. Is the Glossary's definition correct? I have come to understand algae as something completely different? I am denied use of my property during the summer because the sludge smells and the Lake stirs up algae from the bottom.

A8: *The Environmental group examined algae to see if algae growth is influenced by water levels. The conclusion was that there was no significant correlation. (IJC liaison – Russ Trowbridge)*

Q9: I have a question about the goals and constraints of the Study. Is the primary goal to 'decrease the extremes' of the spring and fall water levels? Workers in each group will do as much as possible to decrease the extremes. There are very few constraints but it seems we can't control any of them. How do you remove constraints? Constraints like the Ottawa River if removed would make Lake Ontario levels more acceptable.

A9: *This Study will be the first time that final plans are completely backed by accurate data foundations. Small enhancements allow people to look ahead. Our research is going far ahead of what has been done in the past. We're looking ahead to present solutions. (PIAG – Max Streibel)*

There are 40 years of experience incorporated into the model. (U.S. General Manager – Tony Eberhardt)

The constraints are the requirement to give priority to the uses included in the Boundary Waters Treaty of 1909 that are already incorporated into the Orders of Approval. These include hydropower, navigation, municipal/commercial uses, protection of riparian interests, not flooding Montreal, etc. In addition, there is the reality of limited ability to control what nature pours into (or withholds from) the Lake. Within the context of those constraints, the Study is taking new factors into account. These include recreational boating, the environment, and a much greater presence of near shore development since 1958D was implemented. (IJC liaison – Russ Trowbridge)

Q10: If the health of the system is supposedly the number one goal, and we look at the wetlands and say we're studying them, I don't think so. Fresh water in Lake Ontario is trapped. Years back, in 1982, the water was healthy because muskrats came from fluctuations of water. I question the wetlands; this is really the issue. What takes the nutrients out of the water in wetlands? - The rats. New York State is hard on reestablishing wetlands but those muskrats clean the water. Also, how many people are depending on wells? It's draining the levels. Why can't we put the health of the Lake at the top of the list?

A10: *The health of the system is at the top. You and I are part of the system. So are boaters and so is the environment. We need to preserve the health of all interests. (PIAG – Dan Barletta)*

Comment

Recreational boaters seem to assume that because we have a way of controlling the River, we have a way of controlling flooding and problems. The bottom line is that there is not much you can do as human beings to control that. Let's assume the government could control the water, which is not possible. The wishes of boaters would permanently affect the nature of the Lake. Nature will either hurt us or help us at certain times. There is no way of regulating it. Much worse, we have to have a way of accepting compromise. No regulation will ever solve all the problems permanently. Property owners get to live on the Lake. They learn to enjoy it, and accept it, good or bad.

Q11: Is there any relation between condensation coming down and the water levels in Lake Ontario? Also, the outflows of other rivers and tributaries play some affect on Lake Ontario. Is the Study looking into that? The Ottawa and different Pennsylvania rivers are out of the range of the Study but their outflows affect us all.

A11: *The H & H group is looking at the total supply of the Lake and basin. We're looking at 100 years of information. But tributaries like the Ottawa River are out of our hands. (U.S. General Manager – Tony Eberhardt)*

Q12: My question is about the Ottawa River. It is out of the realm of the Study, but is there any plan to get more control of the River? It would help our regulation.

A12: *It is strictly a Canadian issue. I am unaware of any plans the Canadian Government or Ontario have to develop control structures for the Ottawa River. (IJC liaison – Russ Trowbridge)*

Sodus Point, New York (This meeting was sponsored by Save Our Sodus)
Afternoon Roundtable Meeting
September 10, 2003 2:00 pm

Q1: The prevailing sentiment, at least around here, is that the powers that be have more control than is exercised. How do we respond to people who have it absolutely planted in their minds that the devils who control this are not exercising the powers they really do have?

A1: *We are doing this Study because of the number of deviations the Board of Control has had to make. These deviations come from satisfying various interests. Rest assured, people have to know that this is an extremely complex system and that the whole purpose of this Study is to try to get a plan that's going to be better because we've got better technology, etc. There is only a level of control up to four feet (1.22 meters). Natural conditions determine the system's highs and lows. (PIAG – Max Streibel).*

Q2: If at the present time there is 50% intervention in terms of adjusting levels for the current model, what is the expectation of the percent of variations on a new model when it is complete?

A2: *I don't think there's an answer to the percentage. I think what we're going to have, based on this Study, is a much better understanding of the Lake and the River system. As a result of that understanding, we would like to be able to adjust the outflows prior to any major incidents to avoid dramatic swings. Also, if we get to the end of the Study and can't find a better plan, we are going to keep the one we have. (PIAG – Max Streibel).*

Q3: People around the River are absolutely convinced that you control the height of the water from Montreal. Their feeling is that there is a heavy emphasis on Montreal and what happens in Montreal Harbor. How do you respond to those people?

A3: *Montreal is taken into consideration because there is major commercial shipping there. The situation in Montreal doesn't control what's happening on Lake Ontario, but they do have some influence. (U.S. General Manager – Tony Eberhardt)*

People in Montreal feel the same way; they feel that the system is being controlled by people on the Lake. What we are trying to do is make people aware of those different concerns and there's a balance, and there's appreciation for the different use. (Study Board – Doug Cuthbert)

Q4: Is there a way to have a continuously variable flow control, rather than just constant monitoring; a constant adjustment of flow? Given the computer modeling today, is this feasible?

A4: *The flow changes are set now every week, so the question is, could they be more frequent? Yes, technically they could. The question is whether that's really worthwhile in a broader respect because it takes a number of days and weeks to have an effect on levels on Ontario. (U. S. General Manager – Tony Eberhardt)*

Q5: Is the final approval of the plan only through IJC?

A5: *The IJC will make the final decision based, in part, on several criteria. There are alternative plans being offered to provide different options. As we are doing now, the IJC will go out to the public before they adopt any one of the options that are given to them. (PIAG – Max Streibel)*

Q6: What's the timeframe when we might see the implementation of the new plan?

A6: *2005 or 2006. (U.S. General Manager – Tony Eberhardt)*

Q7: Are you saying that the IJC is the final authority or do the two federal governments have to approve it?

A7: *IJC is the final authority. The governments asked us to look into the outflows but aren't involved after that. (U.S. General Manager – Tony Eberhardt)*

Q8: Do you guys get all the data from your slide presentation about wind fluctuation or is there someone continually monitoring all this?

A8: *This projection was put together by one of the contractors for the coastal group. (PIAG – Dan Barletta)*

This was done specifically for this project over a one-month period. The other aspect of this is that even if nothing changes in the regulation plan, we hope it will; we have a lot of really good data about how the system works. (IJC liaison – Russ Trowbridge)

Q9: When you have the follow-up session next year, will you have some form of modeling you could demonstrate or present?
A9: *That's the game plan. (PIAG – Dan Barletta)*

Q10: Do you anticipate being asked questions at tonight's public meeting about how you weigh different stakeholders' needs in the system?
A10: *The Plan formulation and Evaluation Group has ways to balance the interests out. (PIAG – Dan Barletta)*

We are looking at the system from two things: pure economic and also from a social standpoint. We have to really consider both of these elements. (PIAG – Max Streibel)

It's going to be tough. The technical work groups are going to have to help us understand what the final recommendation is so that we can bring it out and share it with you. In order for the PIAG to be able to go out and support it and say, yes, this is a good plan. (PIAG – Max Streibel)

Q11: What about the environmental aspect? It doesn't fit into either one of those groups?
A11: *We are examining the environment in detail as well. It's going to be tough to balance all interests but the various technical work groups are examining all interests. The Commissioners will eventually decide but public input will influence their decision throughout the whole process. (PIAG – Max Streibel)*

Sodus Point, New York (Save Our Sodus sponsored this meeting. The meeting also contained a presentation by the International St. Lawrence River Board of Control (ISLRBC))
Evening Meeting
September 10, 2003 7:00 p.m.

Q1: When you change your controls, how long does it take to impact the Lake?
A1: *It takes a week to get a centimeter off Lake Ontario, but the effect on Lake St. Lawrence and Montreal is immediate and continuous for that whole period of time. (ISLRBC – Frank Sciremammano)*

Q2: You're taking all this data. Why not set up a control system with this data to hold the Lake levels more constant?
A2: *While the flow is adjusted every week, it is a continuous operation. The adjustment on a weekly basis is reasonable. We're looking at perhaps going to the shorter periods. But that's reasonable, the supplies generally that we're looking at are changing on a period of months. In terms of having a set point and kind of holding it*

steady, that means whatever water comes in, we have to let out. And what happens is, the supplies are very variable. If we did that, Montreal Harbor would go way up and way down every week. (ISLRBC – Frank Sciremammano)

Q3: We received a survey for boaters and which we filled out. We have seen nothing for riparian landowners yet. Is there something forthcoming where there is going to be some input for those people who live along the shoreline?

A3: *For riparians, we have actually surveyed the shoreline. We have pretty good elevations, on a lot-by-lot basis; we know where the houses are and what the composition is. Recreational boaters are much harder to get at than the general public because they move around or trailer their boats. That's why a survey was sent specifically to boaters. (StudyBoard – Frank Sciremammano)*

Q4: Why would you not want the input of the people? I urge you to consider very strongly coming out with such a survey for the coastal group.

A4: *That is why we are here. In terms of gathering the basic data about properties, that has all been done from tax maps, from aerial photos and from site visits. (Study Board –Frank Sciremammano)*

We also did a survey for riparian interests the first year of the Study. (PIAG – Dan Barletta)

The coastal people probably have the best handle on what's going on coastal-wise. There are two primary reasons: one is erosion and the other is flooding potential. The group's consultants have started modeling; they know the soil types along the shores, the bluffs, and the beaches. They have all that information already. They have a feel for where erosion starts and where it accelerates. They have all that information. They know who has breakwalls; if you have a breakwall, they know the quality of that breakwall, whether it's a Class A type breakwall, whether it's a B Class or whether it's something that wouldn't weather increases in water levels. They've got all that information. (PIAG – Max Streibel)

Q5: The results of a marina survey were published in the newsletter. Why haven't results of recreational boating surveys been published?

A5: *Each issue of the Ripple Effects highlights one or two of the Technical Work groups. Down the line it will be covered. (Study Board – Frank Sciremammano)*

Q6: I have a copy of a document dated May 15, 2003 that is called Draft Criteria. One of the suggestions from the Coastal group is to reduce the upper level, which today is 247.3 down to 246.3. Is that really a criterion that you and the coastal group are strongly and aggressively being going after?

A6: *One of the goals of the Study is to be very transparent in what we do. There is a danger in that. We have to have a starting point. This is a starting point to where we basically ask all the groups, tell us what you want in the way of criteria and that's the list that we got; basically unedited. It's only draft; we have only just started looking at that list as a Study Board to decide priorities, whether any of those are relevant*

and what the justification are for all of them, as well as looking at the old criteria to see which ones should carry over. (Study Board – Frank Sciremammano)

Just to throw out one number is prejudicing the whole talk here because every group put in their own highs and lows. Recreational boating put in their own highs and lows, coastal put in their highs and lows when they wanted them. It's not just coastal, it's an overall picture, you have to look at all of these things and take it all in context. (PIAG – Dan Barletta)

Q7: We haul all of our boats together. We bring a crane in and haul 75 boats in two days. If you can tell us, even a month ahead of time, what the projected water level is going to be, we could respond to a problem. Is there a place that's going to happen?

A7: *The forecasts are available on the web at http://www.lre.usace.army.mil/index.cfm?chn_id=1456. If this isn't good enough, anyone can contact us directly for further information through John Kangas our Secretary at (312) 353-4333. (ISLRBC – Frank Sciremammano)*

Q8: Why does the Lake level drop in August instead of when the boating season is done?

A8: *That is the natural cycle. It has to do with the interaction of the supplies to the upper lakes, below the Lake and evaporation rates. If the project wasn't built, the water in the Lake would determine in the hydraulics of the River, the outflow. Now the outflow is determined through a formula and let out. We basically follow what would have occurred with some slight changes. Naturally the Lake drops in August, September, October, and it's a more radical drop. For us to change that would be fighting Mother Nature, and in that process, we would basically restore it downstream. It drops because it naturally drops. (ISLRBC – Frank Sciremammano)*

Q9: If the Ottawa River is controlled, could we save some of the reef? Our problem was shore erosion here, since shortly after ice break, after the frost comes on and everything turning on the Lake. If the Ottawa River was controlled, they could also feed water in. Does the Ottawa River have any kind of controls?

A9: *If the Ottawa River was completely controlled, it might provide a lot of benefits, including what you talked about, it would enable us in the spring to maintain flow. However to get that done, it would take more than an Act of Congress. The Ottawa River is controlled in the upper end somewhat. There is some small control, but it is one of the few kind of natural rivers remaining, and you'd have to delve into the Canadian politics to figure out why. Our charge as a Study Board is not to look at these major structural changes. Our charge is – you have an existing system, it has certain capabilities, could it be managed better? That's what we're looking at. (Study Board – Frank Sciremammano)*

One other thing, from the International Joint Commission perspective, we have a treaty authority to deal with trans-boundary waters. The Ottawa River is beyond our treaty authority. Therefore, it's beyond our control. It's an entirely Canadian issue. So we take its current situation as a given. (IJC liaison – Russ Trowbridge)

Appendix G

International Lake Ontario-St. Lawrence River Study

PIAG Survey Results

November, 2002 – March 31, 2004

This survey was distributed during PIAG public meetings. Below are the questions and a summary of the responses received.

The Public Interest Advisory Group's mission is to ensure effective communication between you and the International Lake Ontario-Study team. Please respond to the following questions to help us find out how you would like to receive information about the Study.

Q1. How useful would each of the following formats be for communicating Study progress to you? (place a check in the column that most applies)

	Very useful	Some what useful	Not very useful
Progress reports	70	21	6
Summary fact sheets	58	23	3
Newsletters	68	25	4
Presentations	66	19	3

Other Comments (explain):

- It was not clear what the stakeholders were expected to share – perhaps asking stakeholders to consider issues before attending a session.
- Put on Web and notify by e-mail every time there is new information available.
- Video and CD presentation plus information.
- Put newsletters on website, and presentations (would be very useful) if part of another session e.g. Shoreline Management Workshop.
- Technical studies, consultant reports and other scientific or technical documents.
- Update accessible web site.
- Very useful meeting.
- Personal communication face to face is important.

Q2. Which is your preferred method for receiving ongoing information about the Study? (Choose <u>one</u>)

7	DVD	47	E-mail/web site
	Information fair	60	Newsletter by mail
14	Public meetings	7	Small interest group meetings
	Toll-free information hotline		

Other (explain):

CD-ROM, Difficult to choose just one.

Q3. How would you prefer to receive information about future meetings? (choose <u>one</u>)

47	E-mail notice	8	Newspaper ads
2	Radio announcement	8	Web site (activities calendar)
1	TV public service announcement	4	Recorded telephone messages
58	Mailing		

Other (explain):

- Letter or Card (2)
- Post Card
- Newsletter
- S.O.S. Save Our Sodus.

Q4. How often would you like to receive information?

18	Monthly	74	Quarterly	21	Twice a year	3	Yearly

Q5. How do you want to discuss your concerns or interests with the Public Interest Advisory Group? (choose <u>one</u>)

31	E-mail	27	Mailed correspondence
41	Open public meeting forum	21	Small group discussions
11	Telephone (Toll-free number)		

Q6. Are there other ways of communicating with you that we haven't identified? If so, would you please list them for us:

- Regular progress reports to all marinas and yacht clubs. Please note: yacht clubs also must be notified, not just marinas.
- Web site could be two-way. Eg: form survey, on-line discussion group.
- Weather channel VHS warning to boaters of water levels dropping dramatically. Update regularly during boating season like storm warning etc. forewarning.
- Advising us on projected water levels <u>in advance;</u> and I would like to be involved in the recreational and commercial boating group.
- Rob Brown a representative of *The Community Press* wrote: We can publish articles and advertisements for public meetings. <u>www.communitypress-online.com</u>.
- Newspaper articles/magazine articles
- Strong communications plan to include mass media
- Fax
- Video Presentation
- Over a Breakfast Meeting
- Paper (Democrat & Chronicle) or TV
- Through area groups like S.O.S. of S.B.I.A.
- Public service announcements via local news can be accomplished by sending out a general press release two weeks to one month in advance.
- Newsletter can be very effective – showing progress reports – receipt of ideas, etc." "John Kangas visited in 2002. He came; he saw our problems and documented them. He answered many of our questions. It was a good visit. It sounded like IJC was concerned.

- You do a terrific job of communicating.
- Thank you, the meeting was very informative.
- Safety for Boaters.
- Public meeting with Town Board Members present along with State, DEC, Feds, etc.

Q7. How did you find out about this meeting?

14	Newspaper advertisement	14	Word of mouth
2	Media coverage	1	Study website
17	E-mail list	7	Ad in community paper
6	Word of mouth	1	Poster

Other (please specify):

- St. Regis Environment Department
- ZIP
- Mailing (21)
- Yellow stickers on Sunday Paper
- Newsletter (4)
- My supervisor asked me to attend (N.Y.S.D.E.C.)
- Cornwall University Mail-In Survey; Requested information on the waterway commission
- Canadian Water Levels Bulletin
- S.O.S.

Q8. Do you know of any performance indicators that we have not identified? If so, would you please list them for us:

- Please consider a 'lifestyle' performance indicator. When I grew up on the Lake, the beach was a meeting place for the neighborhood; it made us part of a unique community. As the beach has vanished and the walls have been built out into the water, beachfront neighborhoods have lost something important. The decision to live on a lakefront is driven by more than economic reasons. Similar to the Environmental TWG, some indicators should be non-economic in nature.
- I would like to see how the 100-year average is calculated, and what the average was, say 50 or 60 years ago – not just current year – show how the average has increased over the years.
- Percentage of roads and housing redevelopment after last 40 years? Available state/town highways – D.O.T. This is biggest factor in additional water input. Less farming and open land for water to soak in the ground. Do you average out rain/snow per year?
- Vulnerability to eco-terrorism via shipping.
- Erosion rate (from aerial photos – recession of shoreline)" Coastal erosion – Article 34 of the NYCRR… Problems of property owners that have non-conforming structure to coastal erosion regulations of New York State. Also, any regulations existing in Canada. Also, non-conforming structures within a flood plain.
- More emphasis on control of the Ottawa River. Do not flood *us* to save Montreal unless Canada does their part.

- How can you place a dollar value on something that can never be replaced.
- Inappropriate flood plain development in the lower River.
- Define 'flood plain' in your glossary.
- If shipping interests are losing so much money, and since we are in a 'recession,' why not – at public's expense – shore up the banks on the North Shore. Maybe then the land owners wouldn't complain so much.
- Homeowners – Between 1946 and 2003, we have lost over 160 feet (48.77 meters) from erosion.
- Yes, what is the average keel depth that will be used for the Study? And, if we are deeper, do we get left behind? We don't make waves with our boats to create the erosion.
- Most performance indicators are economic based. These are mere property owners in the US and Canada who have property damage loss of recreational beach use – Riparian Interest." "Flow Rates; water coming into Lake and water leaving.
- It seems that shipping in Montreal causes our Lake Ontario water level to drop the most. Perhaps Canada would consider a dam on the Ottawa River to control their own water.

- **Groups interested in discussing with the PIAG:**
  - Akwesasne Task Force on the Environment
  - Kiwanis Club of Belleville
  - Canadian Passenger Vessel Association (CPVA),
  - Prince Edward County Chamber of Tourism and Commerce,
  - Quinte Field Naturalists (in the future),
  - PEC Stewardship and Shoreline Management Workshop (Spring 2003)
  - Environnement Portneuf
  - GAR (Groupe d'action pour la restoration du lac Saint-Pierre)
  - ADIC
  - Community Environmental Management Council III (Westphole Road, Rochester) Louise Hartshorn
  - New York State D.E.C. (Bureau of Habitat, Division of Water-Coastal Erosion, and Division of Permits)
  - Porter, NY – Town Board
  - Niagara on the Lake Sailing Club
  - Niagara Rivers Anglers Association
  - S.O.S. & Sodus Bay Improvement Association

International Lake Ontario-St. Lawrence River Study

PIAG Survey Results

Ogdensburg Study Board Meeting, September 19,2002

The following survey was distributed at the Study Board public meeting in Ogdensburg. The responses to the questions are summarized below.

Q1. As the Study progresses, there will be opportunities for us to share information about the project with you. In your opinion, what type of information would you like to receive?

18 Progress Reports
1 News Releases
1 Yearly in-depth comprehensive reports
7 Summary fact sheets
8 Newsletters

Other:

- Explanations why it happens, what it does, and who decided to do it.
- Combine them all
- Environmental impact of raising and lowering of water to nursery area for fish.
- Whenever you have Lake Ontario water quality and level information that we can use to enhance our knowledge.
- As much information as possible
- Progress reports on website
- Public information/consultation meetings
- Newspapers

Q2. How would you like to receive ongoing information about the Study?

15 E-mail/website
5 Public Meetings
14 Newsletters by mail
2 DVD

Other: Chief of the District of Snye

Q3. How would you like to receive information about future meetings?

13 Email
4 TV public service announcements
10 Mailing service
6 Newspaper Ads
4 Website
1 Recorded telephone messages

Other:

- Postings at marinas, Post Office, yacht clubs, and in the paper.
- Post information at marinas (enough for all ship renters).
- Press releases

Q4. How often would you like to receive information?

13 Monthly 16 Quarterly 3 Twice a year 1 Yearly
Other:

- As needed
- Monthly during May to September & Quarterly during October to May
- It will depend on how often you are able to release new information. Sometimes we are overwhelmed with a publication and it takes extra time to go through it. Most information to date I read and reread.

Q5. Are there any ways of communicating with you that we haven't yet identified? If so, would you please list them for us:

- Through our local government. We have land on St. Regis Island in St. Lawrence County. Every year we have more and more of our trees go over because of erosion.
- Honestly and completely.
- Notify area schools: from elementary to university.
- You really need to listen, people do not have enough water, in many cases, to get their boats out of the boat house – can't Montreal have a dam built to help them out? South Shore in Rochester, Lake Ontario, had no business building in a marsh or flood zone – are you selling our fresh water against many people's opposition?
- During the past 45 years, we have had differences with how Lake Ontario levels are maintained. We have had years that produced excessive erosion. The recent years have been more destructive. This year, 2002, has been a disaster for the property owners at the end of Howland Road, North Wolcott, Wayne County, New York. There is nothing like a field trip by members of the IJC to see what is going on at the shoreline and the losses of property. I thank Mr. John Kangas for his visit and time on 18 July 2002.

Appendix H

International Lake Ontario-St. Lawrence River Study

Performance Indicator Suggestions and Responses

May 1, 2003 – January 1, 2004

Canadian Performance Indicator Suggestions and Responses
Coastal Processes Technical Work Group

Source	Performance Indicator Suggestion and Response
Beamsville, Ontario	1C-Canada "The loss of land along the shores." **TWG RESPONSE:** Where possible, performance indicators are being developed in economic terms. Consideration was given to the use of the reduction in property value as a result of land loss as a performance indicator. There are techniques for establishing the decrease in property value as the distance from the building to the bluff decreases. However, these techniques are not widely accepted due to some of their limitations, and we will not be using them. Instead, we will be using the following approach: Most riparians construct shore protection rather than risk the loss of their building due to erosion. We have developed two performance indicators that recognize the economic loss due to erosion and the typical response of constructing shore protection. One indicator is based on the premise that a faster rate of erosion will necessitate the construction of shore protection sooner than if the erosion rate is slower, and this earlier outlay of money has a cost to the property owner. The second indicator considers the impact that higher water levels has on wave damage to shore protection and on the design requirements of shore protection.
St. Catharines, Ontario	2C-Canada "You have addressed shoreline erosion-but it is a major problem-and extremely costly to provide protection as well as a constant loss of land—valuable land." **TWG RESPONSE:** The cost of shore protection for unprotected threatened properties is included in the "Erosion" PI, and the cost of upgrading existing protection if required as a result of higher Lake levels due to a new regulation plan is considered in the "Existing shoreline protection structures" PI.
Québec, Quebec	4C-Canada "For coastal processes in the lower River: A significant and lasting drop in the high-water mark in certain areas may cause riparians to appropriate the land that is now situated above the new high-water mark. This would result in a kind of "social disorder," an attack on public interests, the value of which could be evaluated in terms of public surface area lost or

	which could be lost." **TWG RESPONSE:** In such a scenario, it would seem that the primary concern could be the loss of environmental function of the land through its conversion from a natural area to lawns or farmland. This loss of habitat would be a concern of the Environmental TWG. Some landowners tend to cut the vegetation on the dried riverbed in front of their cottages and homes. Since this activity is likely a contravention of the Fisheries Act in Canada if permits are not sought, we expect the Department of Fisheries and Oceans to take care of this. We have a method to manage this issue and it is not a wide spread practice; therefore it is unlikely to be a useful performance indicator in defining a preferred water management plan. We are also able to calculate the amount of wetland that is dewatered at each flow level below the dam so we will be able to determine if there is a direct effect from this activity on the environment and will base our selection of water management plan based on that type of performance indicator. I did note however that a variant of this issue was considered significant by aboriginal communities above the dam because their land occasionally floods and is not useful for crops or livestock.
Etobicoke, Ontario	9C-Canada **"**Other upper Lakes should be considered as a performance indicator. When Lake levels are at another historic low, it must affect even the St. Lawrence. Lake Ontario and the St. Lawrence are very important areas as one unit. They are dependent upon the larger lakes - Erie, up to Lake Huron, Georgian Bay and Lake Michigan. The latter four have the greatest acreage, shoreline and population. They are dependent upon Lake Superior as all the Great Lakes are. Is there any concerted information on how Lake Huron & Georgian Bay can recover the five feet (1.52 meters) of water which hampers the tourist industry and create great areas of shoreline? The U.S. are affected as well." **TWG RESPONSE:** The variation of supplies coming from the upper Great Lakes are accommodated for in the historic records of variation of outflows from Lake Erie. Supplies from all the upper Great Lakes are also modeled on the stochastic and climate change scenarios. The variation of inflow from Lake Erie is taken into consideration in the development of Lake level scenarios. It is outside the mandate of this Study to evaluate the shoreline of the upper Great Lakes, as regulation of Lake Ontario's outflow will not impact the shorelines of the upper lakes.

U.S. Performance Indicator Suggestions and Responses
Coastal Processes Technical Work Group

Source	Performance Indicator Suggestion and Response
Wilson, New York	3C-U.S. "Inappropriate flood plain development in the lower River." **TWG RESPONSE:** Flood damage to all development on both Lake Ontario and the St. Lawrence River is included in the "Flooding" PI. Similarly, erosion damage to all development is included in the "Erosion" PI. It is beyond the mandate of this Study to determine whether existing development around the Lake and River was appropriate or not.
Waterport, New York	5C-U.S. "Homeowners – Between 1946 and 2003, we have lost over 160 feet (48.77 meters) from erosion." **TWG RESPONSE:** The impact that revisions to the Lake outflow regulation plan would have on shore property owners is the focus of several performance indicators. A model has been developed to estimate the amount of erosion that would occur along the shoreline of Lake Ontario for any series of water levels. One performance indicator considers the impacts that different rates of erosion will have on the need for property owners to build shore protection, and another performance indicator considers the potential need to modify existing shore protection if higher water levels make it possible for bigger waves to reach the shore.
Ransomville, New York	6C-U.S. "Most performance indicators are economic based. There are more property owners in the U.S. and Canada who have property damage loss of recreational beach use – Riparian Interest." **TWG RESPONSE:** It is recognized that water levels affect beach width and riparian access to the shore but this is very difficult to quantify in economic terms on an individual basis. However, a beach access performance indicator was developed for public beaches based on user surveys in 2003 at two popular Lake Ontario swimming beaches. The preliminary results of this work indicate a correlation between beach width and park attendance, which will be extrapolated to the other public swimming beaches around Lake Ontario. While this approach does not capture every riparian interest it does capture a large component of the affected public.

Greece, New York	7C-U.S. "Erosion rate (from aerial photos – recession of shoreline)" **TWG RESPONSE:** Erosion rate information has been used in development of the model that is used to predict how the shoreline will erode in response to future Lake levels. This information is used in the development of our "Erosion" PI.
Avon, New York	8C-U.S. "Coastal Erosion: Problems of property owners that have non-conforming structure to coastal erosion regulations of New York State. Also, any regulations existing in Canada. Also, non-conforming structures within a flood plain." **TWG RESPONSE:** It is recognized that there are numerous non-conforming structures along the shoreline and in flood plains in both the U.S and Canada. These structures may be having undesirable impacts on the shoreline and possibly even the environment. Unfortunately, many of these structures predate the current coastal erosion regulations and there is little that can be done to correct these situations. Furthermore this issue is beyond the scope of the Study. One product of the Study is the mapping of the presence and quality of shoreline protection structures. This information will be helpful in bringing more attention to the inadequacies that exist and the need for rigorous coastal zone management.
Barker, New York	10C-U.S. "The shipping interests are losing so much money, and since we are in a recession, why not at the public's expense, shore up the banks on the north shore. Maybe then the landowners wouldn't complain so much." **TWG RESPONSE:** This is outside the mandate of the Study (modification of regulation plan only – not new structural measures)
Youngstown, New York	11C-U.S. "Erosion - Lake Ontario near the Niagara River (U.S.). I have a cottage on the Lake, two miles East of the Niagara River, that's been in the family since 1918. We've lost over 100 feet (30.48 meters)of land since then. I remember when I was a youngster (40 yrs. ago); we had a 20 ft. beach to play on. However, it seems for the last 25 yrs., the water level always meets the shoreline, with no beach at all. To summarize, I'm for Lake Ontario Water Erosion Reduction (LOWER). **TWG RESPONSE:** The rate of erosion and the presence of beaches is a function of many variables one of which is water levels. Evaluations being performed for the Study will assess the impact of various water level regulation plans on the rate of erosion as well as the impact on existing shore protection structures.

Brewerton, New York	13C-U.S.A. "My geographical area is Jefferson Park near Southwick State Park. Consider not only erosion and property damage from high and current water level but also being precluded from beach use that is not available due to these water levels which property owners pay exorbitant tax dollars for. This property that can only have limited use, if and when water levels recede." **TWG RESPONSE:** See Coastal response 6C.
Rochester, New York	"The best performance indictor for me would be to establish the optimum Lake level at 245 feet (74.68 meters); anything over 245 ft. (74.68 meters) put the shore in danger of further erosion, any level below 245 ft. (74.68 meters) is fine with me. By now, home owners are resigned to experiencing higher Lake levels than we prefer, so anything you can do to protect what we have would be appreciated." **TWG RESPONSE:** The erosion evaluation techniques being developed for this Study incorporate the influence of water level and its importance with regard to erosion rates. Erosion is generally accelerated with high lake levels although erosion certainly occurs even at low lake levels. The Study will evaluate the economic impact of erosion for various water level regulation plans as one of the factors in selecting the best overall plan.
Wilson, New York	"Under erosion: Loss of infrastructure (both public and private – mainly public) relating to roads, water, and sewer lines. This happened in Wilson at various subdivisions." **TWG RESPONSE:** The Study will evaluate the economic loss of erosion to private homes as well as municipal buildings including damage to shore protection structures. It is recognized that erosion losses to roads does exist but these losses are very limited and will not be evaluated due to the lack of road parcel information.
Lakeside Beach, New York	"I am a south-shore, summer resident of Lake Ontario located just west of Lakeside State Park in New York State. While I applaud the effort to boil this all down to indicators, as an individual I found them difficult to understand and determine, what if any action would be taken if necessary. I had my son, who is an Environmental Scientist review and we determined the only directly applicable measurement was the first one related to shoreline erosion. While I understand computing the economic cost I have difficulty in relating to the fact that as each year goes by I loose more frontage and will soon, with a number of neighbors, again have to spend considerable about of $ to protect our eroding shore line.

	I guess I feel that an indicator that surveys lake shore homeowners every 2-3 years, determining how many and how much they actually spent would be a good indicator of the real cost to prevent more erosion." **TWG RESPONSE:** The purpose of developing performance indicators is to create tools that will make it possible to compare the potential impacts of many different alternative plans for regulating Lake levels. A difficulty in developing a performance indicator based on past shore protection expenditures is to determine how the costs would vary with alternative regulation plans. The approach taken by the Coastal TWG has been to develop a model that can estimate the amount of erosion for any water level scenario for each kilometer of the shoreline. This information, combined with our database of existing shore protection and existing buildings, will allow us to estimate, for each water level scenario, the time period in which unprotected properties would need to build shore protection and properties that are already protected would need to replace or strengthen existing protection. The associated costs will also be calculated and incorporated into the performance indicator.
Somerset, New York	"Comparison of Lake levels for 1950-present to 1900 –1950 (period prior to manipulation of level by U.S. Army Corps of Engineers. Then try to maintain level at the natural levels, as it was much better at those times from a landowner's viewpoint. I have lost at least 100,000 cubic feet (2,831.68 cubic meters) of earth since the manipulation began. Along with this at least 30 feet (9.14 meters) of beach has been taken over by the high Lake levels." **TWG RESPONSE:** A model has been developed for the Coastal TWG to estimate erosion that would occur in response to a series of water levels. This tool allows a comparison of erosion that would result from different options for water level regulation in the future. An analysis has been undertaken of what Lake Ontario's water levels would have been if regulation of the Lake's outflow had not been implemented in 1960. Using the erosion model mentioned above, an estimate has been made for one location of the erosion for the period 1960 to 2001 that would have occurred if the Lake's outflow had not been regulated. This was compared to the model's estimate of erosion for the same period with Lake level regulation. At this location, the model estimated that erosion would have been about 50% greater if the Lake's water level had not been regulated. One of the reasons for this is that hydrological supplies were higher than normal for a 30-year period starting around 1970. It is anticipated that the degree of impact that regulation of Lake levels has had on erosion varies with location.

U. S. Performance Indicator Suggestions and Responses
Commercial Navigation Technical Work Group

Source	Performance Indicator Suggestions and Responses
Rochester, New York	1CN-U.S. "Vulnerability to eco-terrorism via shipping." **TWG RESPONSE:** The Commercial Navigation Technical Work Group is aware of these issues. However, this issue is not related to water level regulation, which is the focus of this Study. In terms of security, the International Maritime Organization will implement the International Ships And Ports Security Code, effective July 1, 2004. Ballast water management is in effect, mandatory in the U.S., voluntary in Canada.
Barker, New York	2CN-U.S. "It seems that shipping in Montreal causes our Lake Ontario water level to drop the most." **TWG RESPONSE:** Lake Ontario has a natural seasonal water level cycle of about 1,300 feet (396.24 meters). Vessels coming from overseas load their vessel based on forecasted water levels, usually using a two-week forecast. Approximately three to four times a year, vessels will arrive loaded such that water levels do not permit safe transit of the vessel, even though it had loaded according to the forecasted level. In such a case, the International St. Lawrence River's Operational Advisory Group will be requested to provide additional water for a 24- to 36-hour window to accommodate the vessel. These deviations are tracked, and this information is available from the International St. Lawrence River Board of Control. Over the course of the summer in recent years, these deviations have been taking about one inch of extra water stored for critical needs on the Lake.

U.S. Performance Indicator Suggestion and Response
Domestic, Industrial, and Municipal Water Uses Technical Work Group

Source	Performance Indicator Suggestion and Response
New York	1W-U.S. "Urban runoff and the addition of petrochemicals to the ecosystem by storm water flows over impervious surfaces." **TWG RESPONSE:** This is outside the mandate of the Study. The purpose of the Study is to evaluate the impacts of existing and alternative flow regulation plans. The degree of contamination of storm water runoff is a function of upland land use practices and not a function of the lake levels. The quality of urban runoff should be expected to remain the same regardless of the flow regulation regime evaluated.

Canadian Performance Indicator Suggestions and Responses
Environmental Technical Work Group

Source	Performance Indicator Suggestions and Responses
Hamilton, Ontario	1E-Canada "Some measure of the macro-invertebrate community in zones affected by water level fluctuation would be a valuable addition to current monitoring." **TWG RESPONSE:** Fluctuations in water flow and level can surely affect the population dynamics of macro-invertebrates. Given the great diversity of species in that compartment (as well as in other major biological compartments, such as insects and algae), our Plan of Study developed a "habitat" approach favoring the protection of critical habitats being most susceptible to water level fluctuations. For example, for hard substrates, the colonization rate of zebra mussels in response to water level fluctuations is currently being developed as a performance indicator. Indicators permitting identification of these critical habitats presently include both emergent and submerged plant community, fish community, amphibians and reptiles. Developing habitat protection criteria in using biological indicators at the bottom and the top of the food chain will ensure that intermediate trophic compartments (such as macro-invertebrate and benthic organisms) will also be sustained.
No address provided.	5E-Canada "Annual total numbers of migratory waterfowl (an indication of annual aquatic food production)" **TWG RESPONSE:** The migratory waterfowl population in the lower section of the St. Lawrence River influenced by major water levels (between Lake St. Louis and Lake St. Pierre) is highly variable. Thus, during the spring migration, we estimate that close to 600,000 birds, mostly snow geese, can be surveyed at the peak of the migration. Most of those birds can be observed within the flooded plains of Lake St. Pierre near Trois-Rivières. During the fall migration, numbers of waterfowl decrease significantly to about 50,000 birds, mostly composed of diving ducks (scaups and goldeneyes). Birds then mostly gather on Lakes St. Pierre and St. Louis. Because of the importance of Lake St. Pierre flooded plains during the spring migration, we will strongly recommend to maintain high water levels during the most intensive period of the migration (mid April until the first week of May), to preserve the integrity of the area and be sure that birds will have access to quality feeding sites. (Also see Environmental response to 18E, below.)

No address provided.	6E- Canada "Lake Ontario & St. Lawrence (upper)—degree of invasive fish species in bays and communities of submerged aquatic plants." **TWG RESPONSE:** While the impact of invasive species on the fish community is recognized on a much broader, Lake-wide basis, it is not within the scope of the Study to assess the impacts of invasive fish species on the Study area ecosystem. The interaction of fish and water levels is being investigated and the impact of water levels changes on invasive species will be considered.
Sabrevois, Quebec	7E- Canada "Proliferation of chemical fertilizers (agriculture) for the region between St-Jean and the U.S. border." **TWG RESPONSE:** Tributaries draining from agricultural land are the main sources of fertilizers in the River. These substances favor the proliferation of algae and aquatic plants. The issue of agricultural fertilizers has not been directly addressed by the Study, because the regulation of the St. Lawrence does not impact the source of these substances coming from the tributaries. However, the effects of climate change on water levels and quality and anquatic plants in Lake St. Louis were the focus of a study that will appear in spring 2004. You can find the main points of the study at the following Web address: http://www.qc.ec.gc.ca/csl/inf/inf018_e.html.
No address provided.	8E- Canada "Variation of plant and wildlife biodiversity over time, all along the River." **TWG RESPONSE:** Changes in plant and animal communities over time are performance indicators for this Study. Changes in wetland communities are the focus of several studies and the effects of those changes on faunal communities are also being assessed. For example, the long-term changes in the fish community of the St. Lawrence River are currently used as a performance indicator for the Study. The analysis is based on records of fish abundance and diversity made at the experimental trap fishery operated by the Aquarium of Quebec. The continuous time series of data (since 1975), including information on 40 fish species, has allowed the development of relationships between water level fluctuations and fish abundance for the lower part of the River. Other long-term data series for specific plant and animal species exist for the upper St. Lawrence River and some Lake Ontario sectors and these will be examined in the context in the on-going Study.

No address provided.	9E-Canada "Water quality from a limnological perspective (which is used to characterize water in terms of the kinds of life it supports) all along the River." **TWG RESPONSE:** Water temperature, transparency, turbidity and color are physical characteristics that distinguish the water masses originating from Lake Ontario and from the Ottawa River. In the lower St. Lawrence River, years of low level conditions coincide with warmer, clearer, less turbid, less colored waters, all factors that favor underwater plant growth. These interactions have been described in a performance indicator that allows a determination of the biomass of underwater plants in response to different water level conditions. We are also working on characterizing temperature in Lake Ontario and the upper St. Lawrence. Other limnological variables cannot be quantified at this time for the time period of the Study. Also, there is no real evidence that other water quality variables are a concern with regards to water level regulation.
St-Anicet, Quebec	10E- "Study the pollution dumped by La Guerre River into the St. Lawrence River." **TWG RESPONSE:** Tributaries draining from agricultural land are the main sources of fertilizers in the River. These substances favour the proliferation of algae and aquatic plants. The issue of agricultural fertilizers has not been directly addressed by the Study, because the regulation of the St. Lawrence does not impact the source of these substances coming from the tributaries. However, the effects of climate change on water levels and quality and aquatic plants in Lake St. Louis were the focus of a study that will appear in spring 2004. You can find the main points of the study at the following Web address: http://www.qc.ec.gc.ca/csl/inf/inf018_e.html.
Sabrevois, Quebec	11E-Canada "Proliferation of marine algae for the region between St. Jean and the U.S. border." **TWG RESPONSE:** This region is outside the Study area. However, we are aware of public concerns (in other parts of the Study area) for water quality, particularly algae relationships between water quality and water level regulation are being studied as part of the analysis of impacts of municipal water supplies. The relationship between algae proliferation and water level regulation is secondary, relative to other influences such as nutrient loading and climate change (temperature change).

Sabrevois, Quebec	12E-Canada "The amount of water chestnuts in the region of St. Jean and Richelieu between St. Jean and the U.S. border. **TWG RESPONSE:** The introduction of exotic species surely represents an important stress to the integrity of any aquatic ecosystems. The Plan of Study presently incorporates two indicators of exotic invasive species in the St. Lawrence River: the reed-grass (Phragmites communis) and the zebra mussel (Dreissena polymorpha), which are both considered major invaders of the River and which are very sensitive to water level and flow alterations. In these two cases, a low water regime would favor the spread and establishment of these two exotic species. The recent introduction of water chestnut in the Richelieu River basin is of major concern and efforts to control its spread were put forward three years ago. Although there is a risk of this unwanted species invading the St. Lawrence River, the absence of this species in the SLR limits its potential use as a performance indicator to assess the potential effect of hydrological fluctuations.
Fonthill, Ontario.	13E- Canada "Waterfowl and wetlands restoration." **TWG RESPONSE:** Many wetlands have been restored by Ducks Unlimited in the lower section of the St. Lawrence River. Thus, between Cornwall and Trois-Rivières, close to 30 sites, which total up to 5,000 hectares (12,355 acres) can be surveyed. Some of these sites have been specifically designed to attract large concentrations of migrating waterfowl during the spring migration, such as those found within the Lake St. Pierre area near Trois-Rivières. Our major concerns are then to be sure that minimum water levels maintain the integrity of those sites.
Ajax, Ontario	14E-Canada "Suggest you meld two sets of indicators; many for lower areas are relevant to upper area; add some measure of biological integrity, not just diversity; suggest adding species of bowfin & 2 gars; consider adding walleye." **TWG RESPONSE:** We will make every effort to aggregate the biological response indicators for the geographic regions of the Study, where data permit and when such aggregation is warranted by the science. Habitat supply is a measure of integrity (capacity) of the system for different fish guilds. While our modeling is emphasizing northern pike and yellow perch, fish such as walleye will be included in the analysis for different spawning and thermal guilds.
Dorval, Quebec	15-E-Canada "Equal treatment of recreational boaters from Lake Ontario to Lake St. Louis with priority given to the environment."

	TWG RESPONSE: The experience of recreational and pleasure boating is enriched by a healthy environment rich in diversity and wildlife. While this quality of life has not been expressly addressed by the Study, you will certainly be interested in a report that looks at the anticipated effects of climate change on water levels and quality and aquatic plants in Lake St. Louis. The report will appear in the spring of 2004, and you can find its main points at the following Web address: http://www.qc.ec.gc.ca/csl/inf/inf018_e.html
No location provided	16E-Canada "Fish indicator - include a migratory fish like trout or walleye since River access is important." **TWG RESPONSE:** As part of the Plan of Study, the relationship between water level fluctuations and migratory behavior of a variety of fish species has been examined and analyzed for the fish community of the lower St. Lawrence River. Several fish species (more than 25 and including walleye, lake whitefish, perch, catfish, sauger, among others) were found to exhibit important and large-scale migratory behavior within the St. Lawrence River and the seasonal timing of this migratory behaviour was found to depend to variable degree on fluctuations of the hydrological regime. It is planned to use some of these relationships as performance indicators. Also see Environmental response above (14E). We will be examining the access issue to some degree in wetlands, including tributary wetlands.
No location provided	17E-Canada "Productive Wetland Area from an unobstructed watershed that interfaces with a lake or large river and produces migratory fish." **TWG RESPONSE:** We are calculating habitat supply, including wetland area, for several guilds of fish that would include some migratory species. We are looking at all nearshore habitat and not just wetlands.
Lake Ontario and upper River and lower St. Lawrence River	18E-Canada "Wetland Bird and Waterfowl Abundance and Diversity **TWG RESPONSE:** Lake Ontario and St. Lawrence River wetland bird abundance and diversity are greatly influenced by Lake and River hydrology. As a result, bird use of the Lake Ontario and St. Lawrence River near shore environment was given priority within the Environmental Technical Work Group. Wetland breeding bird abundance and diversity indicators are being developed as environmental performance indicators (PIs) due to their direct and quantitative association with wetland emergent

	plant community diversity and abundance (another environmental PI). Lake Ontario and the St. Lawrence River also support large numbers of migratory birds during the spring and fall. Although the abundance and diversity of wetland dependant migratory birds are also influenced by wetland plant community diversity and abundance, as well as seasonal water level fluctuations, several other variables such as zebra mussels, changes in water clarity, waste agriculture grain availability, and ice-free period also influence migratory bird abundance and diversity. This is especially the case for the diving duck guilds of migratory waterfowl. The interactions and influences of the many confounding environmental and human related variables on migratory waterfowl abundance and diversity currently prevent development of specific quantitative hydrologic and migratory bird PIs. The lower St. Lawrence River floodplain is an exception, as migratory waterfowl (dabbling duck and Canada goose) use of the Lake St. Pierre floodplain has been correlated with flooding. This specific relationship will be used as an environmental performance indicator in the lower St. Lawrence River section of the Lake Ontario-St. Lawrence River Water Regulation Review Study.
Lake Ontario and upper River and lower St. Lawrence River	19E-Canada "Reptile and Amphibian Abundance and Diversity *Population trends (e.g. % increase/decline in occurrence) for indicator species *Diversity of wetland amphibian assemblages (based on Shannon-Weaver diversity index) **TWG RESPONSE:** Herpetile studies are underway; however, preliminary results suggest that literature source material will be relied on to develop performance indicator information. Trends in population and diversity of amphibian assemblages are very good indicators of herpetile health in the area. Unfortunately, because of a lack of field information, it is unlikely that these performance indicators can be field validated.
Lake Ontario and upper River	20E- Canada "In Lake Ontario and upper River, wetland bird and waterfowl abundance and diversity, reptile and amphibian abundance and diversity. In lower St. Lawrence River, wetland bird abundance and diversity, reptile and amphibian diversity and abundance, wetland plant abundance and diversity." **TWG RESPONSE:** It is possible to find 16 species of reptiles and 21 species of amphibian in the lower St. Lawrence River. Most of these are characterized by small numbers, and many species are rare. For example, biologists produced counts of around a thousand

	common map turtles, an endangered species in Quebec, in Ottawa River and Deux Montages Lake, a lake near Montreal. The most common turtle species are the snapping turtle and the painted turtle. Some amphibian species are abundant and common, such as the leopard frog, bullfrog and green frog. The diversity of herpetiles is at its maximum in south-west Quebec, and more precisely in Lakes Saint-François and Saint-Louis. It is possible to find almost all reptile and amphibian species of Quebec province in those areas. The major causes of the decline of herpetiles are habitat destruction and fragmentation, disturbance, contamination and diseases. (Also see Environmental response to 18E.)
Lake Ontario and upper River, and the lower St. Lawrence River	21E-Canada"I support both Wetland Bird and Waterfowl Abundance and Diversity, and Reptile and Amphibian Abundance and Diversity performance indicators. My support for these are for both the Lake Ontario and upper River, and the lower St. Lawrence River." **TWG RESPONSE:** In order to assure that waterfowl will have access to sufficient staging grounds and breeding sites within the lower section of the St. Lawrence River, two performance indicators have been developed. The first performance indicator on migration will favor water levels that maintain minimum flooded plains within the Lake St. Pierre area, one of the most important flooded plains of the whole lower St. Lawrence River and one of the most heavily used staging grounds during the spring migration (up to 600,000 birds at the peak of the migration). During years when water levels are too low, the non-managed flooded marshes and farmlands are almost completely deserted. The second performance indicator will favor plans that prevent nest flooding during the nesting season. Important rises of water levels (more than 20 cm (7.87 inches)) during the most critical periods of the nesting season (mid May until the beginning of July) could have detrimental effects on the breeding population of dabblers, substantially decreasing their productivity. (Also see Environmental response to 18E.)
Lake Ontario	22E-Canada "Wetland bird and waterfowl abundance and diversity and reptile and amphibian abundance and diversity performance indicators for Lake Ontario." **TWG RESPONSE:** (Please see Environmental response to 18E.)

Québec, Québec	Lake Ontario and upper St. Lawrence: Quantity of fish habitat. Conducive area (in hectares) weighted by habitat for eight representative guilds, in terms of their temperature and vegetation preferences and their fry sites. Density of community. Rate of survival of eggs and unfed fry as a function of the retreat of floodwaters. Lower St. Lawrence: Quantity of fish habitats. Conducive area (in hectares) weighted by habitat for different fish species: northern pike, yellow perch, rock bass, coarse fish, lake sturgeon, smallmouth bass. Density of year-class for northern pike. Add: density of community (number of individuals per hectare) at different stages of the biological cycle (eggs, unfed fry, young of year, juveniles/adults) for four indicator species: northern pike, yellow perch, largemouth bass and smallmouth bass. Rate of survival of eggs and unfed fry as a function of the retreat of floodwaters. **TWG RESPONSE:** We are looking at habitat supply for different life stages (including fry) of each of the representative guilds in Lake Ontario and upper St. Lawrence River. We are incorporating the survival of eggs and stranding into the four fish population models for Lake Ontario and the upper St. Lawrence. These will be applicable to the Study area. Density at different life stages and rates of survival are excellent indicators but are beyond the resources of this Study to define. Perhaps over time more information can be gathered to better define these factors.
Lake Ontario	"It has been my experience that two key underlying characteristics contribute to the health and diversity of Lake Ontario coastal wetlands and the Lake itself. 1. Varying stability, 2. Dramatic seasonal fluctuations in water level. As such all animal species associated with Lake Ontario coastal marshes, the marshes which are directly attached to the Lake water cycle are migratory, principally using the marshes as nursery areas, while the plants are either colonizing species (wild rice), or tall perennial species (cattails, hardstem bulrush) able to tolerate several feet of water level fluctuations and freezing. The varying stability refers to an annual cycle they pass through, its peak level during which time the water level fluctuates little, a key element which allows for the successful reproduction of particular species whose reproductive period matches this stable period. The variability is a result of seasonal weather patterns, which cause the time period of the peak water level to vary between years and thus favor different groups of species, maintaining community diversity.

	Lake Ontario coastal wetlands are subject to a relatively unique water cycle, having an annual average high water mark later in the season than almost all other water systems. As such they support specific groups of flora and fauna. I have noted that wetlands and species that occur around the perimeter of the Lake, but are not regularly subject to, or associated with Lake Ontario water levels are included in the Study. As the Study is about Lake Ontario water levels there inclusion seems erroneous. Two indicator species that specifically stand out in this class include the northern pike a river mouth/floodplain marsh species (adapted to an early April peaking water level), and muskrat, a stable water level species, both should be thrown out. All species at risk listed are associated with relatively stable water cycles and systems and thus aren't suitable as coastal marsh indicators. A spotted gar might be reasonable, but only the largest of marshes are able to support these. Reptile and amphibian diversity are also poor indicators as virtually all amphibians are associated with a floodplain water cycle/spring ephemeral ponds, or a stable water levels (beaver ponds - bull and green frogs). The list of potential herpatile species seems to only include the tree frog, and the map turtle. I would suggest that indicator species should be key Lake Ontario species, which use coastal marshes as part of their life cycle. Important fish species might include, yellow perch, white bass, or muskellunge. Appropriate amphibians might include tree frog. Birds might include trumpeter swans or any of the marsh monitoring species. The key is to use species whose reproductive period occurs between late April and early July, and which are not year round residents as a coastal marsh will dry up and freeze more often then not. The above lends itself to reproductive temperature guilds. Significant emergent plant species could include wild rice, cattails, and hard and soft-stem bulrush and sand bar willow, and should be tied to coverage to at certain water level elevation classes and wind exposures. Lake Ontario coastal marshes are harsh environments, a result of the widely fluctuating water levels. At the same time this high level of disturbance generates tremendous productivity as each spring the warm empty marsh is reset for geometric population growth.

	Its my view that current water regulation has subtly altered the water cycle increasing the level of freezing flooding disturbance, and favoring the June reproducing species by regularly having the annual stable peak during this time period. The increased annual flood freeze range has had the secondary effect of excessively raising the water level during the lower high water years, reducing the extent to which emergent vegetation is able to colonize. As the previous seasons dead emergent stalks represent the structure for the subsequent spring, less emergent equals less reproduction equals less productivity. Regulations changes needed to correct the above; impacts are both subtle and possible." **TWG RESPONSE:** Although Lake Ontario is a hydrogically dynamic system and in some aspects unique (timing of peak water), the coastal wetlands associated with this system are not unlike other wetland types. Wetlands in many ecoregions are subject to highly variable water levels within a growing season and longer-term 'wet-dry' hydrologic cycles of several years. Although 'varying stability' is critical to the maintenance of all wetland habitats including Lake Ontario coastal wetlands, this should not preclude using species or communities that prefer more stable water conditions as Performance Indicators (PIs). These species have adapted to the hydrologic variability and are regular breeding bird inhabitants of Great Lakes coastal wetlands. These species are also important to the overall diversity of the coastal wetland community. Their habitat requirements are some of the most hydrologically sensitive and thus should not be ignored in a review of water regulation. Ranking and weighting these PIs, however, must incorporate the dynamic nature of the Lake Ontario system and incorporate ranking scales based upon suitable baseline values. This approach will reduce the potential contradictory response of these indicators with other hydrologically dynamic environmental PIs, but ensure a more complete environmental assessment of alternate water regulation plans. The role of fluctuating water levels in maintenance of habitats and associated biodiversity and ecosystem function has been a central theme to this process and a core concept in the workings of the Environmental Technical Work Group. Most of the faunal indicators revolve around the potential responses of the wetland geomorphic types (barrier beach, open embayment, protected embayment, and drowned river mouth) to the water level scenarios being considered, and the maintenance requires

	fluctuating levels. The yellow perch and temperature guild approach you suggest are being included in the Study. I also agree that indicators need to represent key species with life histories that use these habitats, but disagree that northern pike and muskrats do not fit this class because of their need for stable levels. An important consideration is that this is not only a study of Lake Ontario, but a study of the Lake and River and how they function as a continuum. Northern pike make a viable indicator because their spawning and nursery habitat requirements are largely fulfilled in habitats that are strongly influenced by fluctuating water levels, and they are also a key predator altering trophic structure in littoral systems, and provide an important fishery resource. Research in the upper St. Lawrence has pointed to water level effects as well as changes in the watershed as an influence on their critical habitats (see J. M. Farrell "Reproductive Success of Sympatric Northern Pike and Muskellunge in an upper St. Lawrence River Bay" in *Transactions of the American Fisheries Society* 130:796-808). Also important is that the northern pike, and the muskrat, are found along the entire Lake and River gradient and allow comparisons to be made between the areas where differing water levels exist in response to the same management scenario. The muskrat will be important because their life history is dramatically affected by how water levels are managed and they have strong effects on vegetation structure themselves because of their herbivory influences. Water level variation plays an important role in maintenance of their abundance over time. Current vegetation studies in the Lake Ontario and upper River systems indicate a remarkable dominance of cattail species in most of the wetlands exposed to the effects of Lake management and these are an important food source for muskrats. Overall, we view the greatest asset of the Study is the fact that scientists, managers, and user groups are looking at the system collectively for the first time. This represents a step towards a holistic approach that may lead to adaptive management to better manage the system.

U.S. Performance Indicator Suggestions and Responses
Environmental Technical Work Group

Source	Performance Indicator Suggestions and Responses
Northern St. Lawrence	2E-U.S. "Migration of wildlife including threatened and endangered species (i.e. wolves)." **TWG RESPONSE:** This area of research is beyond the scope of the Study for Environmental TWG, and this region is in fact outside the Study area. Also, it should be noted that even upstream of Lake St. Louis there is no ice breaking except in early spring. Although this issue has not been studied, anecdotal evidence suggests that this is probably not significantly affecting cross-ice migration, at least within the Study area.
Northern St. Lawrence	3E-U.S. "Ice breakers eliminating migration of wolves across the St. Lawrence and into Maine. How can we keep enough ice at certain times to allow wolves and other species to cross the River as they had done historically?" **TWG RESPONSE:** This area of research is beyond the scope of the Study for Environmental TWG, and this region is in fact outside the Study area. Also, it should be noted that even upstream of Lake St. Louis there is no ice breaking except in early spring. Although this issue has not been studied, anecdotal evidence suggests that this is probably not significantly affecting cross-ice migration, at least within the Study area.
Youngstown, New York	4E-U.S. (Lake Ontario and the upper River) "Extent and impact of invasive species in Lake Ontario and the upper River." **TWG RESPONSE:** Invasive species are considered an important threat to the future of Great Lakes resources and some are being used in the development of indicators (especially wetland plants). When developing performance indicators we have the requirement of making sure they have identified responses to water level fluctuations. Many of these relationships are unclear for major invasive species in the Great Lakes (e.g. zebra and quagga mussel, Cercopagis, Bythotrephes, Round Goby, Eurasian ruffe etc.). We also preferred considering the effects of critical resources that are more directly related to water level management - specifically those associated with wetlands and nearshore habitats. An adaptive management approach would assist in monitoring changes in the ecosystem following a change in water level management policy. Enhanced monitoring may shed light on the

	effects of invasive species on the system and the role of water levels.
Hilton, New York	12C-U.S.A. "The water level this year has been the highest over the longest period of the season in many years (BRAVO). This is great for boating, hunting, and especially the fish. The salmon can spawn now. Before they could not get passed the mud flats to the rock beds to spawn. Now I fear there are too few to make a difference. But possibly they will come back. I think you can float more cargo in and generate more power too? Does not everyone win this way?" **TWG RESPONSE:** The water levels in Lake Ontario are subject to water supply from precipitation and inflow from Lake Erie and not completely subject to water regulation at the dam. In Western Lake Ontario streams salmonid recruitment nearly completely fails due to problems associated with water and habitat quality. Because of this, access of fish to streams is primarily a recreation fishing opportunity issue. For cold water species the magnitude of runs appears to be primarily related to the amount of flow being supplied by the local watershed due to regional precipitation levels as well as recent stocking policies. The mud flats could be due to high deposition levels from sediment inputs from the surrounding watershed, and it can be seen that higher levels could help fish cross them. The effect of fish access to streams and rivers is being considered for other species of fish (primarily spring spawners). When developing performance indicators to assess water level management scenarios, we have the requirement of making sure we have identified responses to water level fluctuations. We also preferred considering the effects of critical resources that are more directly related to water level management- specifically those associated with wetlands and nearshore habitats. An adaptive management approach would assist in monitoring changes in the ecosystem following a change in water level management policy. Does everybody win? Not necessarily, an important consideration is that this is not only a study of Lake Ontario, but a study of the Lake and River and how they function as a continuum. Water level responses to management are different in different sections of the system.

Mannsville, New York	"Fish Habitat Supply & Abundance – In addition to those mentioned, please add lake trout, brown trout, steelhead, salmon, and walleye." **TWG RESPONSE:** The fish species you have suggested are clearly of prime importance to Lake Ontario fisheries and the ecosystem. In development of indicators the need was to consider the effects of critical resources that are more directly related to water level management - specifically those associated with wetlands and near-shore habitats. Because lake trout for instance are deep spawners, their direct connection to water level management is not well established (although indirect effects between this species and near-shore processes have been made in other systems). For browns, salmon, steelhead and walleye, access to tributaries is important but flows directed from local watersheds and stocking levels are the primary factors affecting the magnitude of runs (with unique exceptions such as during extreme lows that provide physical barriers to the tributaries). Monitoring following any alteration in water level regime as well as an adaptive management approach would assist in assessing changes in the ecosystem following a change in water level management policy. Thank you for your input into the development of performance indicators.
No location provided	2W-U.S. "Water quality, water levels and fisheries." **TWG RESPONSE:** We are looking at the effects of water level fluctuations, fish habitat supply and temperature as it affects fisheries species throughout the whole Lake Ontario-St. Lawrence River system.

Canadian Performance Indicator Suggestion and Response
Hydroelectric Power Technical Work Group

Source	Performance Indicator Suggestion and Response
Port Perry, Ontario	"RE: value of replacement power. Assuming peaking of power houses to continue, their value in emergencies is huge." **TWG RESPONSE:** Peaking capability for Ontario Power Generation and New York Power Authority facilities has been authorized by the IJC since 1960. Quebec Hydro does not peak. Peaking capability was an important component of the response to the August 2003 blackout. Additionally, on a daily basis peaking provides the ability to produce more power during the high demand hours of the day and to reduce production during the low demand hours. In this manner, the clean, inexpensive hydropower can be utilized, thereby reducing the amount of power produced by other more expensive fuels.

U.S. Performance Indicator Suggestion and Response
Hydroelectric Power Technical Work Group

Source	Performance Indicator Suggestion and Response
Mannsville, New York	"Please consider replacement power alternatives in addition to fossil generation (for instance nuclear, wind, solar)." **TWG RESPONSE:** The source of any replacement power in the United States and Canadian electric grids is a function of many factors, including cost, fuel characteristics, environmental compliance requirements, etc. Hydropower generated on the St. Lawrence system is highly reliable, and has base load characteristics. The fossil fuel of choice for new development in many areas is natural gas, because of its environmental performance. New nuclear generation is not being pursued anywhere in the region. Ontario, Quebec, and New York are all investigating measures to provide incentives for the addition of new renewable generation sources (such as wind and solar) within their jurisdictions. These resources, however, do not have the reliability and cost performance characteristics of hydropower.

Canadian Performance Indicator Suggestions and Responses
Hydrology & Hydraulics Technical Work Group

Source	Performance Indicator and Suggestions
Sabrevois, Quebec	1H&H-Canada "The levels of the Richelieu River." **TWG RESPONSE:** The Richelieu River is outside the mandate of the Study. However, performance indicators for the St Lawrence River at the outlet of the Richelieu River at Sorel are being included in the Study.
Port Perry, Ontario	"Frazil ice. It is formed by super-cooling of open water and may occur in depths from1 to 8 meters (3.28 to 26.25 feet). Suggest deleting and solving locally as required" **TWG RESPONSE:** 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 adopted must contain the flexibility to vary flows in the winter to manage ice formation in the upper St. Lawrence River.

U. S. Performance Indicator Suggestions and Responses
Hydrology & Hydraulics Technical Work Group

Source	Performance Indicator Suggestions and Responses
Rochester, New York	2H&H-U.S. "Flow Rates; water coming into Lake and water leaving." **TWG RESPONSE:** Yes, the amount of water entering and leaving the Lake will be tracked in the simulations of the regulation plans.
No location provided	3H&H-U.S. "I would like to see how the 100-year average is calculated, and what the average was, say 50 or 60 years ago – not just current year – show how the average has increased over the years." **TWG RESPONSE:** This is not a performance indicator, but all the information on levels is publicly available so anyone can calculate the levels for the periods of their choice. See web site: http://chswww.bur.dfo.ca/danp/network_means.html. 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.

East Amherst, New York	4H&H-U.S. "Publish the long-term-average level of Lake Ontario for the Years 1900 – 1940 the year before the Corps of Engineers started manipulating the Lake Levels. This, of course manipulated the long-term average levels. **TWG RESPONSE:** This is not a performance indicator, but all the information on levels is publicly available so anyone can calculate the levels for the periods of their choice. See web site http://chswww.bur.dfo.ca/danp/network_means.html. 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.

Canadian Performance Indicator Suggestions and Responses
Recreational Boating and Tourism Technical Work Group

Source	Performance Indicator Suggestions and Responses
Dorval, Quebec.	4-R-Canada "Equal treatment of recreational boaters from Lake Ontario to Lake St. Louis with priority given to the environment. **TWG RESPONSE:** An inventory of all marinas, yacht clubs and state, provincial or privately run boat launch ramps was conducted during summer 2002. Personal interviews inventoried services provided at each marina and yacht club. We identified 168 marinas and yacht clubs in operation along Lake Ontario and St. Lawrence River shoreline during the 2002 boating season including Lake St. Louis. We completed personal interviews with 159 of the 168 marinas and yacht clubs (95% of total). Operators were asked about impacts to their business from both high and low water conditions and mitigation measures used. In surveying individual boaters on the Canadian side we approached a random sample of members of the Canadian Power and Sail Squadrons. 2,604 boaters (1,478 English speaking and 1,126 French Speaking) were selected, 32% in the Lake Ontario area, 14% in the upper St. Lawrence, and 54% in the lower St. Lawrence. Recreational boating impacts were evaluated considering boater's 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. A Technical Work Group focusing on the Environment is studying all aspects of the impact of various water levels on the environment throughout the whole Study area.
No location provided	5-R-Canada "Number of small recreational boats/crafts in operation from one year to the next." **TWG RESPONSE:** Researchers had access to two major studies. The first one was conducted by the Canadian Marine Manufacturers Association completed in 2003 titled "Economic Impact Analysis of Recreational Boating in Canada: 2001". The second commissioned by the City of Burlington was prepared by Touristics + Shoreplan Engineering Limited. This latter document was for "Internal Resources Only" and not a public document. As one of the PIAG

	and Recreational Boating and Tourism TWG members also served on the City of Burlington's Marina Feasibility Study group some of the information was available to him. From these two studies we were able to ascertain that "The number of boats in Ontario are projected to increase 1.8 percent annually between 2003 and 2005, 1.75 percent annually between 2005 and 2010 and 1.5 percent between 2010 and 2015. The number of boats in New York is projected to increase 1.86 percent annually between 2003 and 2005, 1.8 percent annually between 2005 and 2010 and 1.6 percent between 2010 and 2015. Boats are getting longer and wider, meaning marinas will need to accommodate these larger dimensions in their slip designs."* *Touristics + Shoreplan Engineering Limited, while some of their data was credited to "Canadian Marine Manufacturers Association completed in 2003 titled "Economic Impact Analysis of Recreational Boating in Canada: 2001"
No location provided	7-R Canada "Damage to small recreational boats/crafts" **TWG RESPONSE:** Through the process listed below Yacht Club and Marina operators and individual boaters were asked what range of water levels maximizes their boating experience. Also at what levels too high or too low, restricted the amount of boating and what is the economic impact of that restriction? Most of the marinas (78%) impacted by low water in 2001 indicated they lost revenue due to low water conditions. The average revenue lost per marina was $15,000. Depth measurements were taken at selected slips and launching facilities to establish bathymetry in order to develop the water level – impact relationship for each facility. An inventory of all marinas, yacht clubs and state, provincial or privately run boat launch ramps was conducted during summer 2002. Personal interviews inventoried services provided at each marina and yacht club. We identified 168 marinas and yacht clubs in operation along Lake Ontario and St. Lawrence River shoreline during the 2002 boating season including Lake St. Louis. We completed personal interviews with 159 of the 168 marinas and yacht clubs (95% of total). Operators were asked about impacts to their business from both high and low water conditions and mitigation measures used. In surveying individual boaters on the Canadian side we approached a random sample of members of the Canadian Power and Sail Squadrons. 2,604 boaters (1,478 English speaking and 1,126 French Speaking) were selected, 32% in the Lake Ontario area, 14% in the Upper St. Lawrence, and 54% in the Lower St. Lawrence. Recreational boating impacts were evaluated considering boater's 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.
No location provided	Have we evaluated and gathered information about commercial fishing activities to produce stage-damage curves? *Impact on the resource (see fish habitat) *Impact on accessibility to sailing areas and fishing areas *Impact on clientele of tourist outlets (restaurants, hotels, fabricators, etc.) Thus the following indicator: Economic damages to commercial fishing operators. Interviews conducted with principal operators will help determine how much extreme water levels limit revenues or increase costs (supplementary operating costs etc. loss of revenue linked to water levels). **TWG RESPONSE:** The Recreational Boating and Tourism Technical Work Group was charged with developing: (1) performance indicators that would show effects of changing water levels on recreational boating and tourism interests, and (2) ideal criteria for water levels that would best meet the needs of recreational boaters and associated businesses. Although the methods differed slightly between the research conducted on the Canadian and American sides, we developed a three-pronged approach. On the US side, a mail survey was used to elicit specific information about expenditures and impacts of high and low water levels on their use of the area. The second group was Lake Ontario and the St. Lawrence River marina and yacht club owners who were contacted in person to assess their impacts and take physical measurements of depths at slips and boat launching facilities. The third group was charter boat operators who were surveyed by mail to assess the impacts on their business. This latter group was as close to commercial fishing that we considered to date. Commercial fishing was not identified as a (significant) group to be included in the study. A member of the Recreational Boating and Tourism TWG has made an attempt to ask for more information and questions of the clarification of Lousie Therrien but no new information has been reported on as of June 21st, 2004.

U.S. Performance Indicator Suggestions and Responses
Recreational Boating and Tourism Technical Work Group

<table>
<tr><th>Source</th><th>Performance Indicator Suggestions and Responses</th></tr>
<tr><td>East Aurora, New York</td><td>1R-U.S. “What is the average keel depth that will be used for the Study? And, if we are deeper, do we get left behind? We don’t make waves with our boats to create the erosion.”
TWG RESPONSE:
The average draft used in the evaluation was determined from responses to our Boater Survey, which asked respondents for the draft of their boat(s) including propeller. The resulting length draft matrix was used in the analysis.
<table><tr><td>Type and Boat Length</td><td>Mean</td><td>Type and Boat Length</td><td>Mean</td></tr><tr><td>Motorboats</td><td></td><td>Motorboats</td><td></td></tr><tr><td><16'</td><td>18”</td><td><4.88 m</td><td>45.72 cm</td></tr><tr><td>16-25’</td><td>28”</td><td>4.88-7.62 m</td><td>71.12 cm</td></tr><tr><td>26-39'</td><td>35”</td><td>7.92-11.89 m</td><td>88.90 cm</td></tr><tr><td>40+'</td><td>43”</td><td>12.19+ m</td><td>109.22 cm</td></tr><tr><td>Sailboats</td><td></td><td>Sailboats</td><td></td></tr><tr><td><16'</td><td>24”</td><td><4.88 m</td><td>60.96 cm</td></tr><tr><td>16-25'</td><td>44”</td><td>4.88-7.62 m</td><td>111.76 cm</td></tr><tr><td>26-39'</td><td>58”</td><td>7.92-11.89 m</td><td>147.32 cm</td></tr><tr><td>40+'</td><td>72”</td><td>12.19+ m</td><td>182.88 cm</td></tr></table></td></tr>
<tr><td>Thousand Islands Area</td><td>2R-U.S. “Volume of out-drive repairs due to varying water levels.”
TWG RESPONSE:
Outdrive repairs were not measured explicitly. Recreational boating impacts were evaluated considering boater’s daily expenditures and their willingness to pay beyond those expenditures along with the indirect impact on the local economy.</td></tr>
<tr><td>Thousand Islands Area</td><td>3R-U.S. “Socio-economic benefits of small boat recreation in the 1000 Islands”
TWG RESPONSE:
Recreational boating impacts were evaluated considering boater’s daily expenditures and their willingness to pay beyond those expenditures along with the indirect impact on the local economy.</td></tr>
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Wilson, New York	"Sailor out of Wilson, NY, 2003 water levels were better than the last couple of years. Plenty of rain and no severe draining of Lake Ontario Basin. Please consider the recreational boating needs of the general boating community." **TWG RESPONSE:** The recreational boating needs of the general boating community have been examined thoroughly and in detail. All boaters utilizing Lake Ontario or the St. Lawrence River in the US and Canada have been represented in the analysis
No location provided	"Not sure this is what you expect to show here but these are my concerns: As a powerful agency you have the clout to come down HARD on the recurring nightmare generated by the Army Corps of Engineers to dig up the riverbed and promote winter navigation. Every time they need to "Job Justify" they come back at us with this "Plan". Hydro needs "stable ice cover"...you can't get it if they succeed! As for my personal need...I have a Canadian made Limestone, 20', drawing only 12" prop depth...you traditionally reduce my ability to get into my slip once we pass Labor Day and the "Vacationers" go home. I do appreciate your giving us a break for as long as you do. At this point only Mother Nature can really help and send us some darn rain!!." **TWG RESPONSE:** Based on our evaluation of the water level needs of recreational boaters on Lake Ontario and the St. Lawrence River, criteria for the range of acceptable levels from mid-April through mid-October along with performance indicators (water level damage curves) have been submitted to the Plan Formulation and Evaluation Group to be used in their evaluation.
Lake Ontario, Chamount Bay	"Recreation Boater. Maintain water levels + or - 6" during June - Sept." **TWG RESPONSE:** Based on our evaluation of the water level needs of recreational boaters on Lake Ontario and the St. Lawrence River, criteria for the range of acceptable levels from mid-April through mid-October along with performance indicators (water level damage curves) have been submitted to the Plan Formulation and Evaluation Group to be used in their evaluation.

New York	14C-"Try to maintain a June time frame water level throughout the year. Or as close as humanly possible. This would benefit the local economy, especially in the fall. Loss of total boating hours added together is tremendous when the water levels are too low to use your boat. The biggest problem here is we have no one large corporate entity to stress this factor. The individual has no unified voice. Even the marina business is small operation. But added together, this is a great economic force that can't be overlooked at the local, county and state levels. (taxes, economic development, residual services) Please give us your consideration." **TWG RESPONSE:** Based on our evaluation of the water level needs of recreational boaters on Lake Ontario and the St. Lawrence River, criteria for the range of acceptable levels from mid-April through mid-October along with performance indicators (water level damage curves) have been submitted the Plan Formulation and Evaluation Group to be used in their evaluation. Additionally, our TWG has been discussing communication issues in light of your concern of "no unified voice" as well as a mechanism to communicate anticipated water level changes to recreational boaters before they occur.
Sodus Bay, New York	15C-U.S.A. "For Sodus Bay, NY, that the water levels be left up after Labor Day (until a week after Labor Day)." **TWG RESPONSE:** Based on our evaluation of the water level needs of recreational boaters on Lake Ontario and the St. Lawrence River, criteria for the range of acceptable levels from mid-April through mid-October along with performance indicators (water level damage curves) have been submitted to the Plan Formulation and Evaluation Group to be used in their evaluation.

Mannsville, New York	Economic Damages to Marinas – Please consider the impact on other related industries (Sport Fishing Charters, Hotels, Restaurants). As a result of low water… 1 - # of trips canceled a year. 2 - # of boat damage claims. 3 - $$ value/damage to boats. 4 - # of days a boat is landlocked. **TWG RESPONSE:** Recreational boating impacts were evaluated considering boater's 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.
North Tonawanda, New York	Effect of Lake levels on launch/haul-out dates for yacht clubs and marinas on the Great Lakes. I know how water has forced 'early' haul-out at out clubs on Lake Ontario a few times in past years. **TWG RESPONSE:** Effect of Lake levels on haul out is of particular concern and is a primary focus of Lake level criteria determination.

Canadian Performance Indicator Suggestion and Response
Study Board

Source	Performance Indicator Suggestion and Response
Montréal, Quebec	1Gen-Canada "Look at PI's over time: short, medium and long-term. Plan for a regular reconfiguration of criteria. In a context of ADAPTATION, the criteria must and should be able to adapt also. Plan for adjustments before 2050." **RESPONSE:** For their final report to the Commission in October 2005, 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. But it is ultimately the decision of the IJC itself as to which of the options they select – the Commission has endorsed the continuous series of studies in the past, recognizing that changing conditions require flexible adaptation.
Port Perry, Ontario	"Regarding Erosion: Storms and seiches cause the most severe damages and there is very little anyone can do about them. Suggest this be made clear to all no matter which plan is used for regulation." **RESPONSE:** The flood and erosion evaluation techniques developed for this Study recognize the importance of wind-generated forces as well as water level fluctuations and incorporate these factors.

U. S. Performance Indicator Suggestions and Responses
Study Board

Source	U.S. Performance Indicator
No location provided	2Gen-U.S. "Indigenous Cultural Needs. For example, Mohawk have specific indigenous uses and requirements for water levels to maintain cultural practices." **RESPONSE:** 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 Commission 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 and several related environmental studies have been undertaken including a significant contract let to the

	Akwesasne Task Force on the Environment (ATFE) to identify and communicate Mohawk concerns. The ATFE contract was completed on March 31, 2004 and forwarded to the Study Team.
Hamlin, New York	3Gen-U.S. "Please consider a 'lifestyle' performance indicator. When I grew up on the Lake, the beach was a meeting place for the neighborhood; it made us part of a unique community. As the beach has vanished and the walls have been built out into the water, beachfront neighborhoods have lost something important. The decision to live on a lakefront is driven by more than economic reasons. Similar to the environmental TWG, some indicators should be non-economic in nature." **RESPONSE:** This socio-cultural impact is recognized by the Study Team, but is difficult to evaluate as is noted by the suggestor, and can also be a function of many facets of changing times. The observation and concern will be noted by the Study Team and PIAG. We expect that many other qualitative aspects of social well-being will be raised at public meetings and considered throughout the Study.
Greece, New York	4Gen-U.S. "Percentage of roads and housing redevelopment after last 40 years? Available state/town highways – D.O.T. This is biggest factor in additional water input. Less farming and open land for water to soak in the ground. Do you average out rain/snow per year?" **RESPONSE:** Yes, water supplies are averaged out over months and years as the Great Lakes respond more to long-term trends in water supply than short-term daily, weekly or even monthly variations. This concern has been previously considered by regional water resource scientists with no strong definitive conclusion. Water supplies to the Great Lakes vary for many reasons and variations due to human development and urbanization of the watershed(s) is considered to be within the range of natural and expected Great Lakes-wide, water supply variability.
Mannsville, New York	"It would be helpful to include examples of "sample data" for each performance indicator. This would help to clarify exactly what you are measuring for those of us who may not be familiar with these particular measures. That clarity, in turn, would assist us in passing judgment on these PIs regarding their ability to add value in relation to our interests." **RESPONSE:** Comment noted and considered an excellent suggestion to be followed up by the Study Team and employed in future presentations. We expect to have short summaries for each performance indicator, including the source of basic information and a summary of the quantitative data.

Rochester, New York	"My recommendation is not in the level datum but a more general suggestion. It has been the practice to start the level reduction early in the mid summer with the resulting consequence of many marinas and recreational boaters having to pull boats at what I consider too early a date. I would really appreciate an effort to lengthen the higher water for a little later in the season. I realize that there are a lot of factors to consider but for too long the South Shore Owners Assoc. have wielded influence beyond what I consider reasonable. There really are other groups that should receive the same consideration and it is my hope that you will take these people into consideration." **RESPONSE:** The recreational boating needs of the general boating community have been examined thoroughly and in detail by the Recreational Boating and Tourism Technical Work Group. All boaters utilizing Lake Ontario or the St. Lawrence River in the US and Canada have been represented in the analysis. The effect of Lake levels on haul out is of particular concern and is a primary focus of Lake level criteria determination. Based on our evaluation of the water level needs of recreational boaters on Lake Ontario and the St. Lawrence, criteria for the range of acceptable levels from mid-April through mid-October along with performance indicators (water level damage curves) have been submitted to the Plan Formulation and Evaluation Group to be used in their evaluation. Among the options considered is a lengthening of the period for higher Lake levels during the summer months.