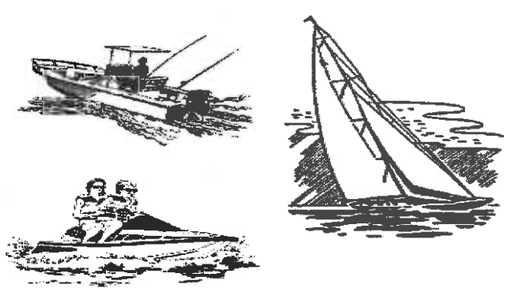
Estimating the Economic Impact of Changing Water Levels on Lake Ontario and the St. Lawrence River for Recreational Boaters and Associated Businesses

A Final Report of the Recreational Boating and Tourism Technical Work Group

EXECUTIVE SUMMARY



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The International Joint Commission established the International Lake Ontario – St. Lawrence River Study Board in 2000 and commissioned them to undertake a comprehensive five-year study to assess and evaluate the current criteria used to regulate outflows from Lake Ontario through the St. Lawrence River. The Study Board created technical work groups charged with gathering scientific data on different interests affected by water levels on Lake Ontario and the St. Lawrence River. The Recreational Boating and Tourism Technical Work Group (hereafter called RBTTWG) oversaw the research on recreational boating and boat-related tourism businesses.

The area of study includes Lake Ontario (and the lower portion of the Niagara River where boaters enter the water primarily to boat on Lake Ontario), the Upper St. Lawrence River (from Cape Vincent to the Moses Saunders Power Dam), and the Lower St. Lawrence River (from Lake St. Louis to Lake St. Pierre). The RBTTWG was charged with developing: (1) a general impact assessment of recreational boating on the study area, (2) performance indicators that would show the effects of changing water levels on recreational boating and tourism interests, and (3) ideal criteria for water levels that would best meet the needs of recreational boaters and associated businesses.

Canadian and U.S. research teams developed a three-pronged approach to study the impacts of water level changes on recreational boating and related tourism. Each approach involved a different audience and a different method to assess the impacts of water level changes. The first audience, recreational boaters, was surveyed initially by phone to determine their use of Lake Ontario and the St. Lawrence River, then by mail for specific information about expenditures and the impacts of high and low water levels on their use of the area. The second group, marina and yacht club owners, was contacted in person and by phone to assess the impacts of fluctuating water levels and to obtain physical measurements of depths at slips and boat launching facilities. The third group, charter boat and tourboat operators, were surveyed by mail and phone to assess the impacts of fluctuating water levels on their businesses. All data was collected in 2002 and 2003.

From these studies we estimated that recreational boaters in the U.S. and Canada spent $566 million on boating-related trips taken to Lake Ontario and the St. Lawrence River in 2002. These expenditures are exclusive of additional en route expenditures that occurred in areas that do not border the study region. U.S. and Canadian boaters received a net benefit or consumer surplus of approximately $393 million in 2002.

Of the $178 million in total expenditures on the US side, $68 million resulted from tourist-related spending (from boaters residing outside four groupings of counties along the New York border of these waters). This tourist-related spending, after considering indirect effects, resulted in total output of $96 million and 1,380 full-time equivalent jobs. Based on a Canadian national survey, each dollar spent (direct expenses, net import) added another $1.50 through indirect and induced expenditures. Tourism

activity was not measured in Canada, but the Toronto and Montreal areas generate substantial economic activity linked with commercial boating activities (e.g. tour boats). As an example, for 14 tourboat operators out of 27 contacted, loss of income between 1998 and 2002 related to water levels was estimated at $727,000.

Data from the U.S. boater survey indicated that the majority of boaters (57%) believed that both natural and man-made factors cause the fluctuating water levels on Lake Ontario and the St. Lawrence River. Since that is in fact the case, it would be desirable to increase through information and education the percentage even further. However, 30% of all boaters believe mostly man-made factors cause fluctuating water levels. This percentage is even greater among private dock owners (40%) and respondents who couldn't go boating at some point in 2002 because of low water levels (43%). Over one-third of boaters in eastern Lake Ontario and the St. Lawrence River thought man-made factors were the primary cause. A similar study conducted in 1991-1992 asked the same question of Alexandria Bay boaters, and at that time, a smaller proportion (19%) thought man-made factors were the primary cause. The majority (69%) then believed it was a combination of factors, more so than currently. Perhaps this indicates a shift in belief that man has more control over nature.

Water level – impact relationships can be calculated for all the performance indicators developed by the RBTTWG, however we have chosen to focus on two performance indicators – total possible boating days lost and net economic value lost (willingness-to-pay). These measures provide both an estimate of recreational loss and economic loss as water levels change. The economic measure is the one chosen by the economic advisors to the Study Board to be most comparable to measures used by other Technical Working Groups, and is expected to be used by the Study Board when comparing impacts between different interest groups.

Water level – impact relationships were created by reach to reflect the difference in water levels between Lake Ontario and the St. Lawrence River and along the St. Lawrence River. The Lake Ontario Reach includes the lake itself and the portion of the St. Lawrence River down to and including Cape Vincent. The remainder of the Upper St. Lawrence River was divided into two reaches associated with the water level gauge measurements at Alexandria Bay and Ogdensburg. The three reaches on the Lower St. Lawrence River were referenced to the following water level gauges: Pointe Claire for Lake St. Louis, Sorel for Lake St. Pierre, and Varennes for Montreal-Contrecoeur.

Figures 1 and 2 represent our best estimates of the water level – impact relationships for the Lake Ontario Reach. Figure 1 depicts the relationship in terms of total possible boating days lost by month and Figure 2 uses net economic value lost (willingness-to-pay) as its y axis. The shapes of the curves are virtually identical; only the y axis scale differs. The graphs are scaled to both feet and meters. Each line represents days or net economic value lost during a different month of the boating season. The graphs show that impacts of lower water levels would be greater in the summer months of July and August than early spring or fall months. Lake Ontario Reach users start to experience losses when water levels drop below 247 ft. The losses are minor until

about 245.5 ft. when they start to increase and then show a dramatic increase at 244.8 ft. By way of example, looking at the month of August, we see that if the water level is maintained at 247 ft., for that entire month, boaters could boat as often as they wished, as no one would be affected by low or high water levels. As water levels drop, economic losses would be expected because boats could not launch. Approximately $7.5 million in economic benefits would be lost if the water level were 244 ft. for the entire month of August (Fig. 2).

Low water levels where significant losses of benefits occur affect the three boating segments somewhat differently—marina users, launch ramp users, and private dock owners. The larger boats tend to be located at marinas. Low water levels during the boating season may keep these boaters from boating. If low water levels are predicted for fall, this may require marinas to haul boats out of the water early, thus shortening the boating season and threatening the economic viability of marinas. Launch ramp users have more flexibility. If low water levels are a very localized problem for a given launch ramp, boaters may be able to shift to another ramp or launch at a marina. For more pervasive low water levels, launch ramp users may shift to other waters (e.g., Lake Champlain, Finger Lakes in New York). Private dock users in the short term would probably lose boating benefits, as their boats are associated with primary residences or second home properties, and they have less flexibility to seek alternative places to boat. In times of high or low waters, media reports often overstate the actual situation, or fail to give adequate coverage when water levels return to a generally safe range for boating. This situation keeps many boaters at home and adds to the negative economic impact estimate that would be obtained solely from estimating boater days lost when waters are at unsafe levels.

For the Upper St. Lawrence River - Alexandria Bay Reach, there appears to be no water level without any impacts for boaters (Figs. 3 and 4). A few boaters are experiencing problems with low water at the same time other boaters are experiencing problems with high water. The least amount of impact appears to occur between 245 ft. and 247.2 ft.

The Ogdensburg Reach of the Upper St. Lawrence River has fewer boaters than the other sections and consequently, estimates of impacts are smaller (Figs. 5 and 6). Impacts appear to be minimal above 243.8 ft. Impacts due to high water levels are quite small compared with low water impacts below 242.5 ft.

The range of acceptable water levels appears to be quite large for all Lower St. Lawrence River boaters (Figs. 7 through 12). A possible acceptable range for the Lake St. Louis Reach is 21 m. to 22.5 m. (Figs. 7 and 8). For the Montreal-Contrecoeur Reach, a rather large range exists from 6 m. to almost 10 m. (Figs. 9 and 10). The range for Lake St. Pierre is the narrowest, at approximately 4.25 m. to 5.25 m. (Figs. 11 and 12).

The RBTTWG reviewed the performance indicators depicted in the Figures and established a range of water levels which we thought would be acceptable for the boating constituency overall and which is logically consistent between the Lake and Upper River

reaches. Consideration was given to developing a range of levels that not only minimized adverse impacts to boaters but that also provided a reasonable spread in consideration to regulation plan formulation. The RBTTWG reached a consensus that a ± 1.4-foot variance around the ideal level of 246.2 ft. (75.04 m.) for Lake Ontario was a reasonable water level range for boaters. Taking into account the average difference in water level elevations between Lake Ontario and the Upper St. Lawrence River (Table ES-1), we determined that water levels on the Upper St. Lawrence River resulting from the Lake Ontario criteria would also be within an acceptable range. For the Lower St. Lawrence River, the acceptable range is greater considering that the river flow is not regulated. Differences in Lower River sections are associated with specific hydrologic conditions and topography of each section.

It is important to note that the critical period during the boating season subject to unacceptable water levels has historically occurred from late August through mid October. Thus, the greatest incremental gains to recreational boating would be if higher water levels could be achieved during the fall. Therefore, the RBTTWG strongly emphasizes that the range specified is to be applied for the full extent of the boating season 15 April through 15 October.

Table ES-1 presents the ideal target level by reach along with the acceptable lower and upper bounds.

Table ES-1. Ideal criteria for water levels by reach for recreational boating interests for the boating season 15 April through 15 October. (Chart datum is shown for reference.)

Study Reach	Chart Datum		Ideal Level		Minimum Level		Maximum Level	
	(ft)	(m)	(ft)	(m)	(ft)	(m)	(ft)	(m)
Lake Ontario	243.3	74.3	246.2	75.04	244.8	74.61	247.6	75.46
Alex Bay	243.0	74.1	245.8	74.92	244.4	74.48	247.2	75.34
Ogdensburg	242.5	73.9	245.1	74.70	243.7	74.27	246.5	75.13
Lake St. Louis	66.9	20.4	70.5	21.5	68.6	20.9	74.8	22.8
Lake St. Pierre	12.5	3.8	14.8	4.5	13.9	4.25	17.1	5.2
Montreal - Contrecoeur	15.7	4.8	21.3	6.5	18.0	5.5	32.8	10.0

In addition to the criteria above, the Recreational Boating and Tourism Technical Work Group makes the following recommendations to the IJC based on the observations of the group over the course of the study period:

- We recommend that the IJC insure that a member of the Board of Control be an individual with a working knowledge of lake level issues and impacts regarding recreational boating on Lake Ontario and the St. Lawrence River.

- The IJC should implement a Communications Plan for improving communications between the St. Lawrence River Board of Control and Lake

Ontario and St. Lawrence River recreational boating interests. The Communications Plan should include the following:

A. Establish Board of Control liaison to the Lake Ontario and St. Lawrence River boating community.
B. Develop and maintain a list of Lake Ontario and St. Lawrence River boating community Point Of Contacts.
C. Provide information regarding forecasted extreme levels via "early alert system" to boating community and promote subscribing to water levels bulletins to boaters.
D. Provide information from monitoring efforts to boaters on a regular basis.
E. Develop education program for all interests to better understand water level issues including water level control.

- The public generally does not understand the capabilities of the IJC and the Board of Control nor how they reach their decisions. The decision making process needs to be more transparent. How the Board of Control reaches consensus rather than majority decisions is particularly not well understood. Improved communications and education are needed. As an example, perhaps a FAQ section on the web site would be helpful to those interested enough to be seeking more information.

- Considering that the data and analysis conducted for this effort will be outdated in the near future and that the new plan should be adaptive (Study Board Principle), we suggest implementing a monitoring plan or system for recreational boating.
- A cost-effective plan should be based on:
  A. an actual data collection system with relevant stakeholders;
  B. focus on the most sensitive areas (e.g., Gananoque area, Lake St. Louis, Alexandria Bay, North Sandy Pond)
  C. consider using continuous data collection tools (e.g., Internet short survey);
  D. involve boat related associations (e.g., OMOA, Canadian Squadron).
  E. a periodic review (e.g., each five years) in order to assess trends (e.g., new needs, adaptation options, etc.) in the boating activity and industry.

Finally, an adaptive management team (or any other relevant institutional mechanism) should be created to insure a bi-national and coordinated effort.

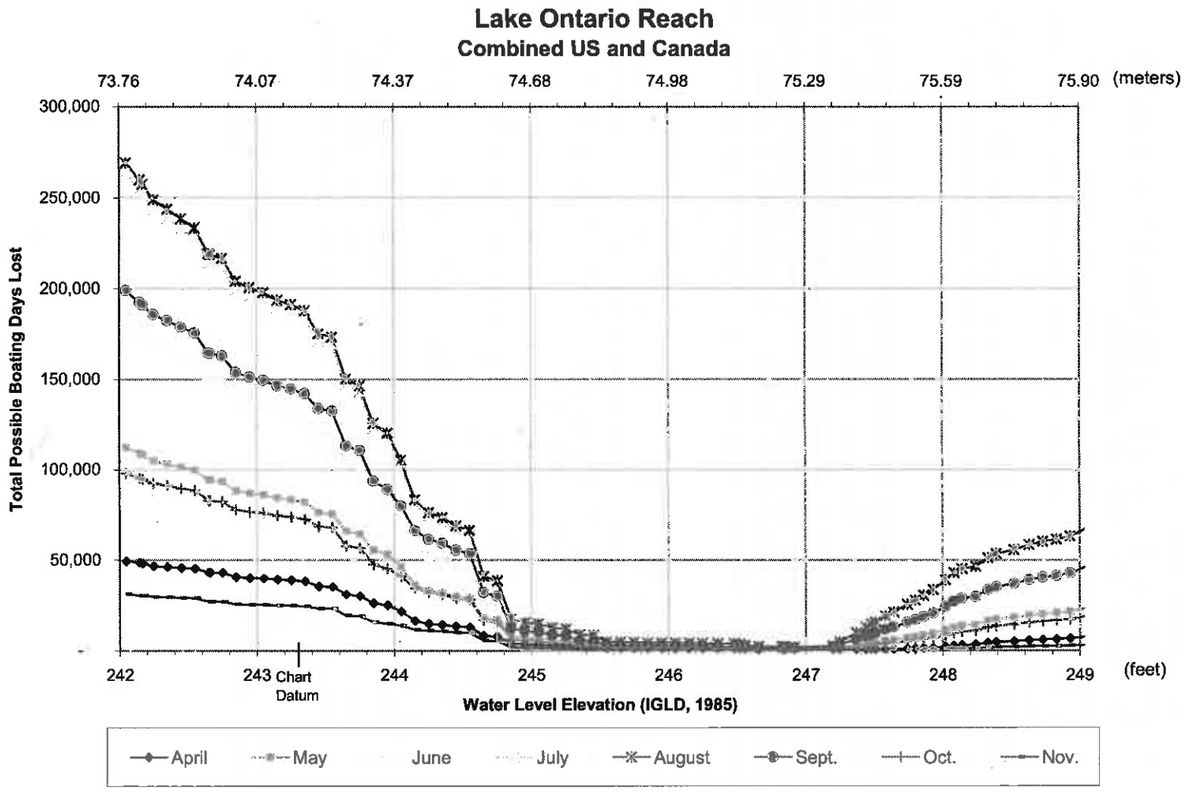

Figure 1. Water level – impact relationship using total possible boating days lost by month for all US and Canadian Lake Ontario Reach users.

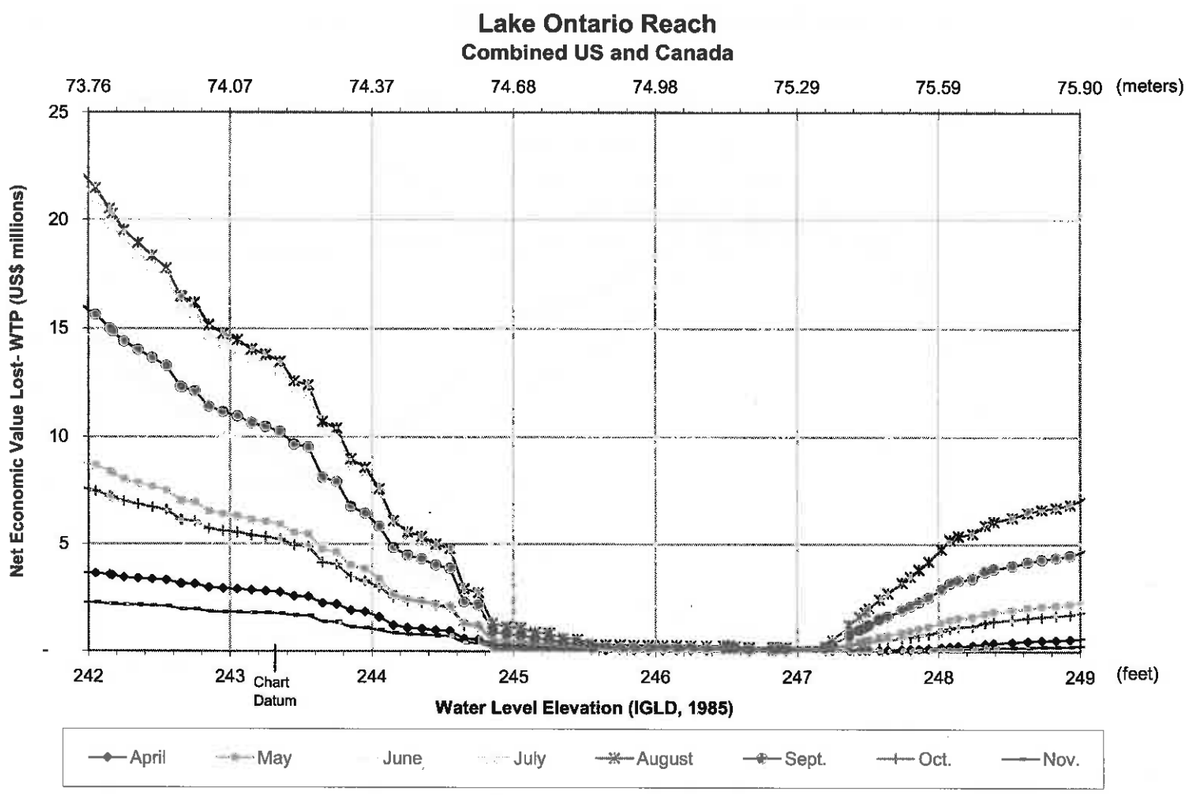

Figure 2. Water level – impact relationship using net economic values lost by month for all US and Canadian Lake Ontario Reach users.

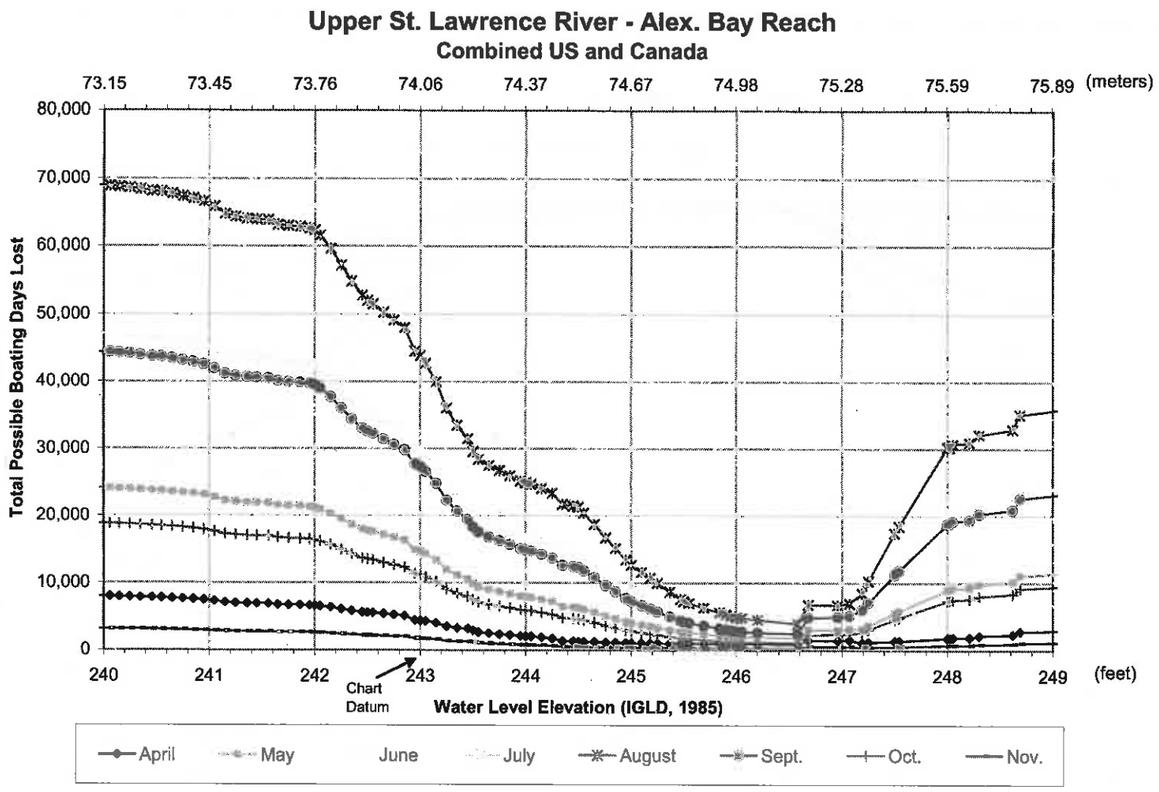

Figure 3. Water level – impact relationship using total possible boating days lost by month for all US and Canadian Upper St. Lawrence River – Alex. Bay Reach users.

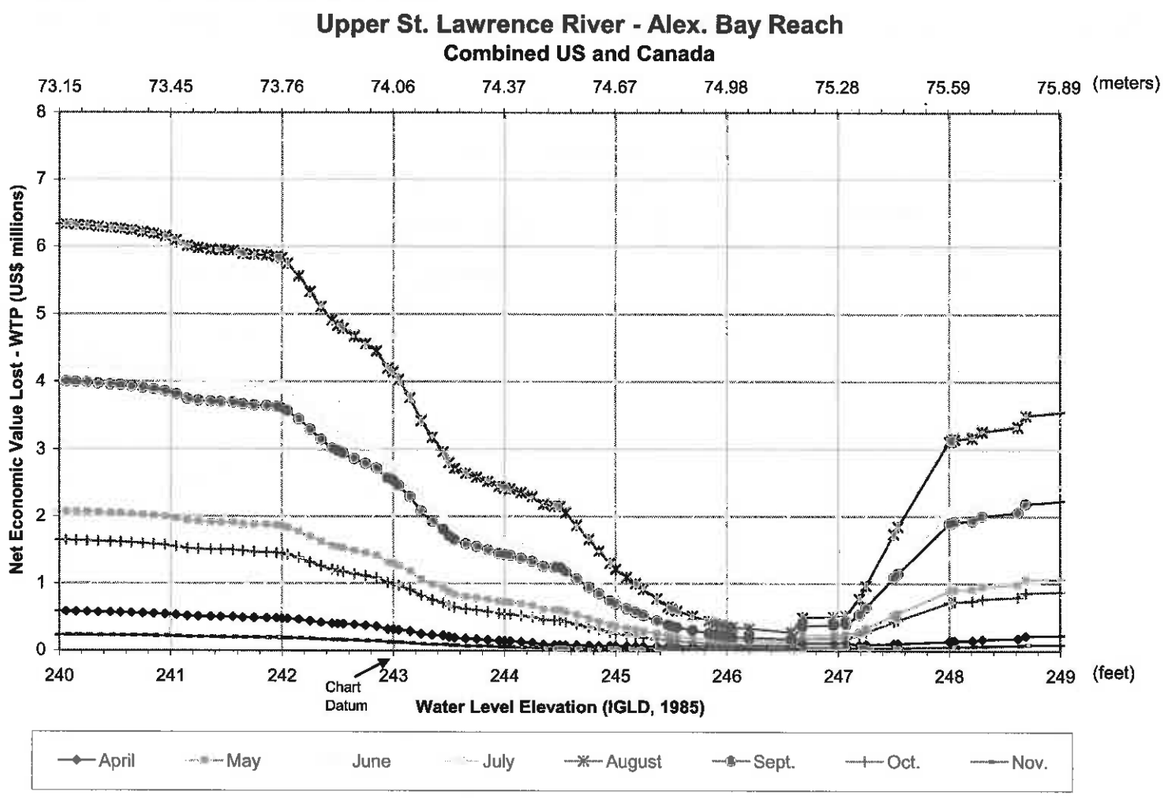

Figure 4. Water level – impact relationship using net economic values lost by month for all US and Canadian Upper St. Lawrence River – Alex. Bay Reach users.

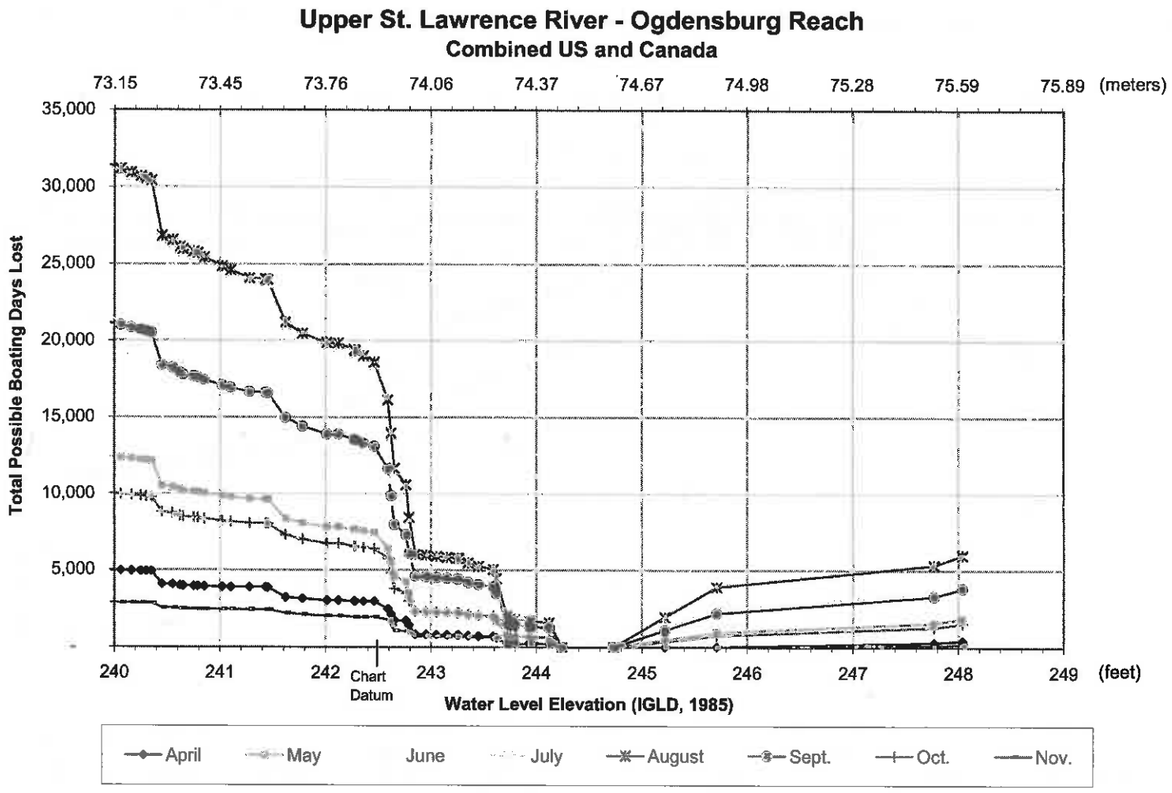

Figure 5. Water level – impact relationship using total possible boating days lost by month for all US and Canadian Upper St. Lawrence River – Ogdensburg Reach users.

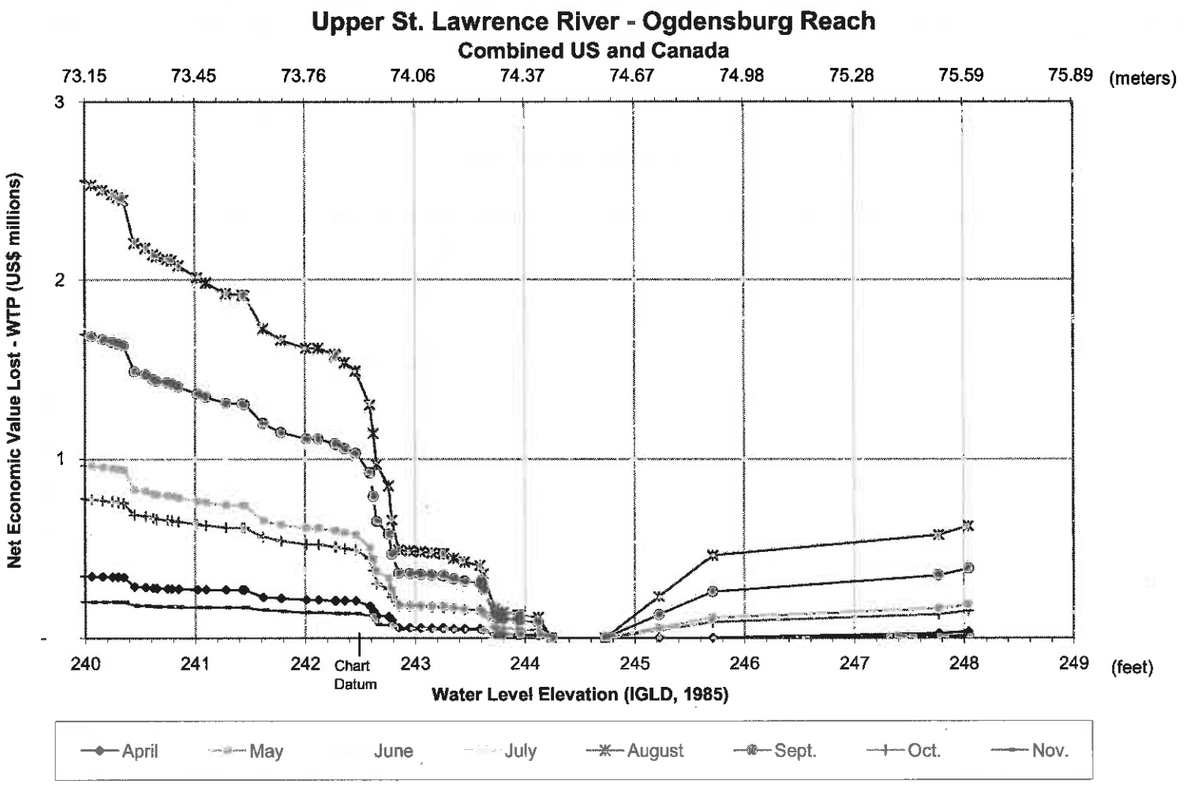

Figure 6. Water level – impact relationship using net economic values lost by month for all US and Canadian Upper St. Lawrence River – Ogdensburg Reach users.

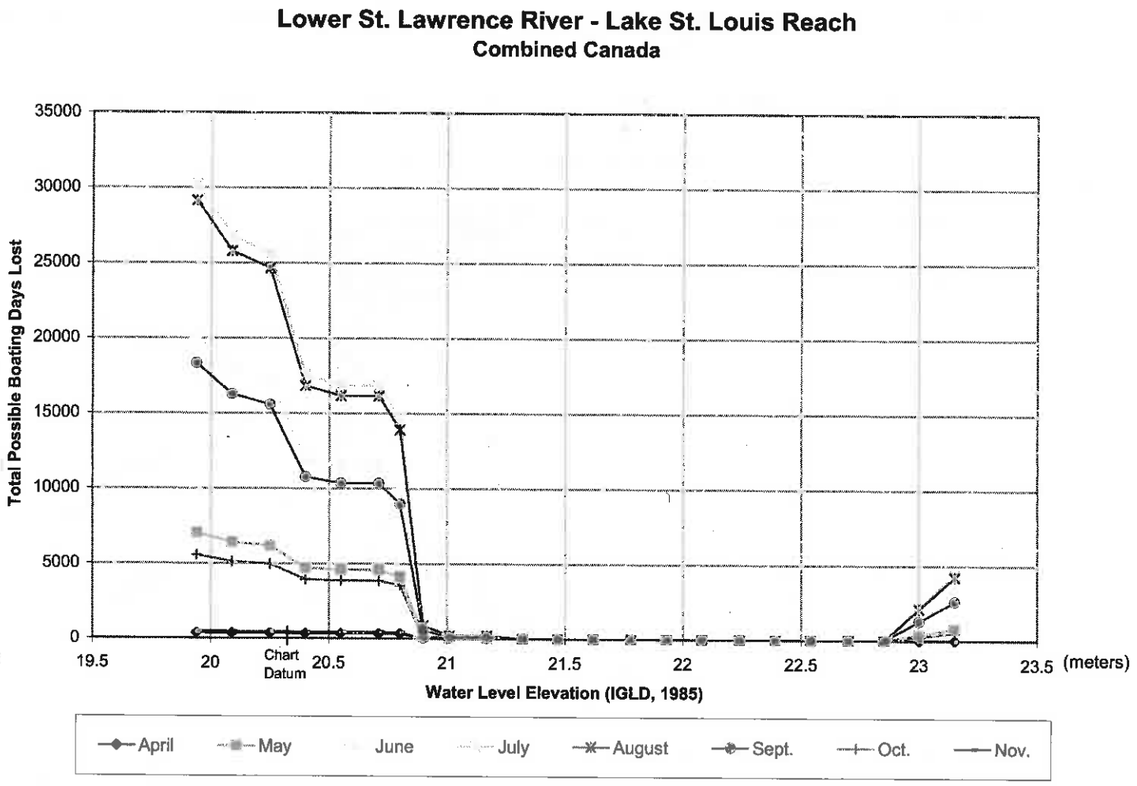

Figure 7. Water level – impact relationship using total possible boating days lost by month for all Canadian Lower St. Lawrence River – Lake St. Louis Reach users.

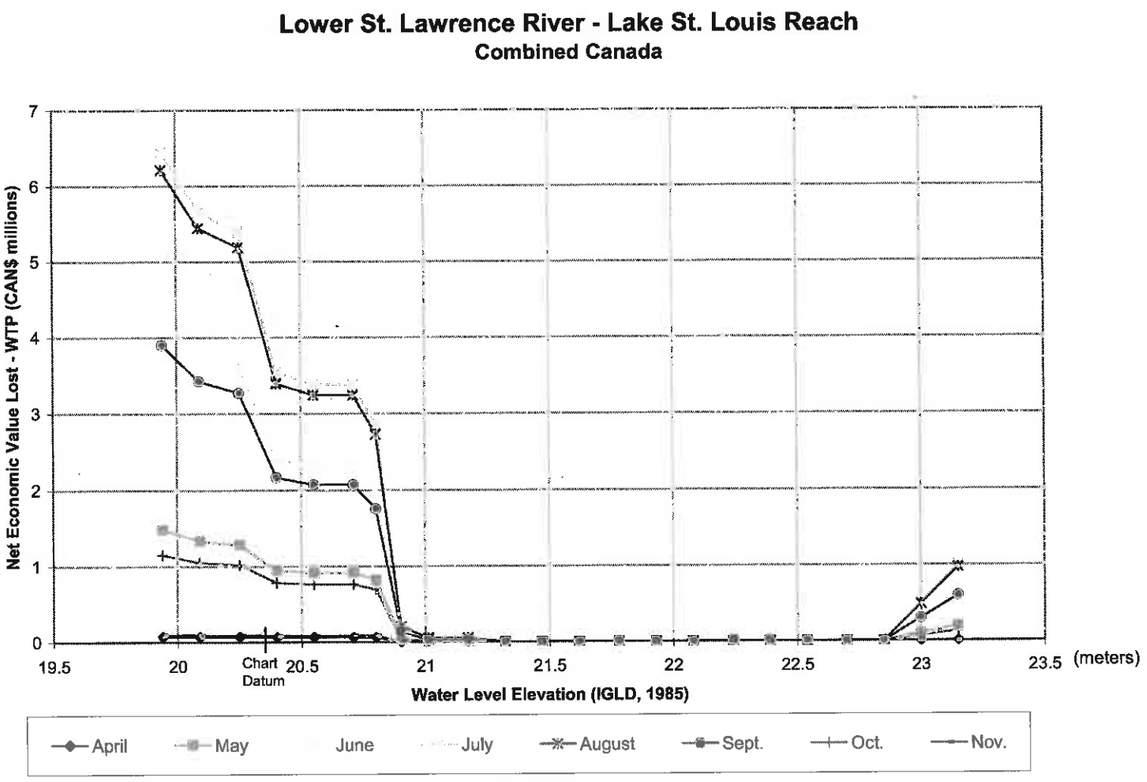

Figure 8. Water level – impact relationship using net economic values lost by month for all Canadian Lower St. Lawrence River – Lake St. Louis Reach users.

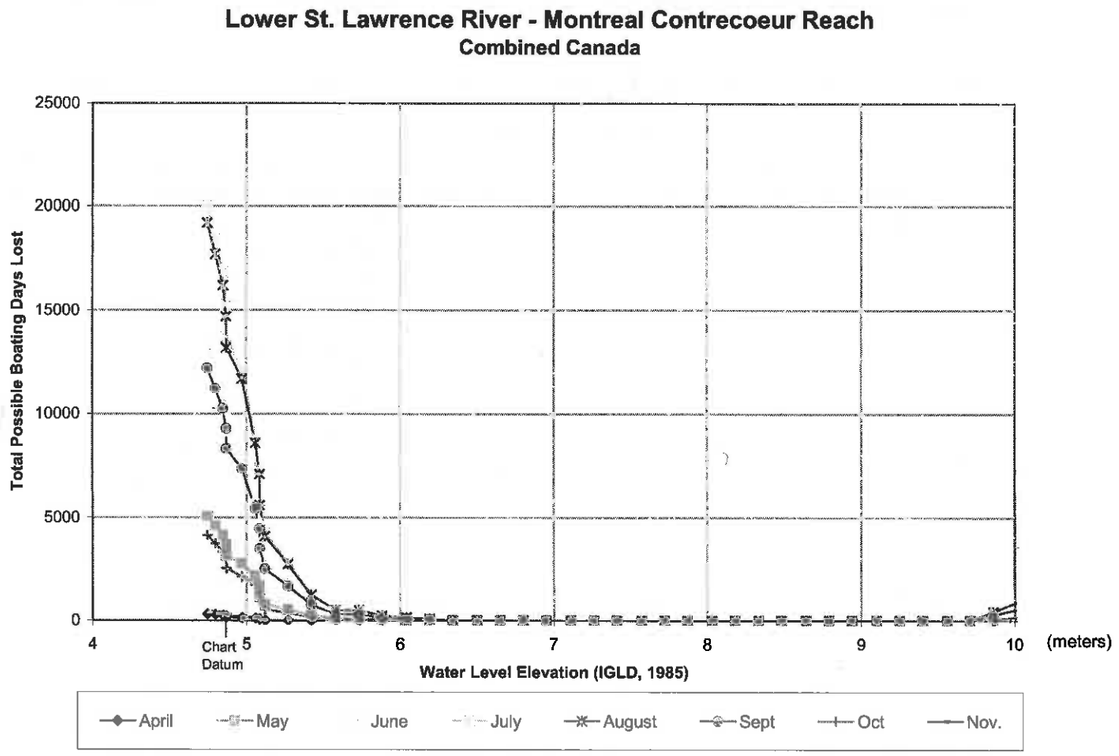

Figure 9. Water level – impact relationship using total possible boating days lost by month for all Canadian Lower St. Lawrence River – Montreal Contrecoeur Reach users.

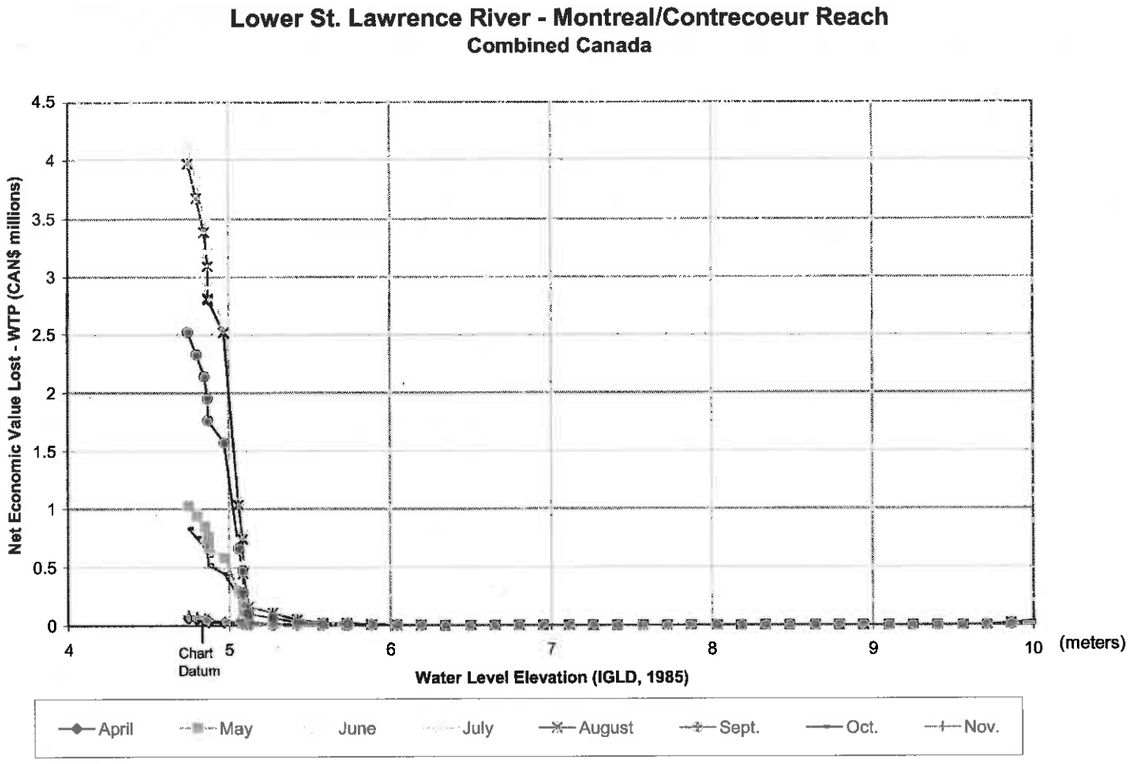

Figure 10. Water level – impact relationship using net economic values lost by month for all Canadian Lower St. Lawrence River – Montreal Contrecoeur Reach users.

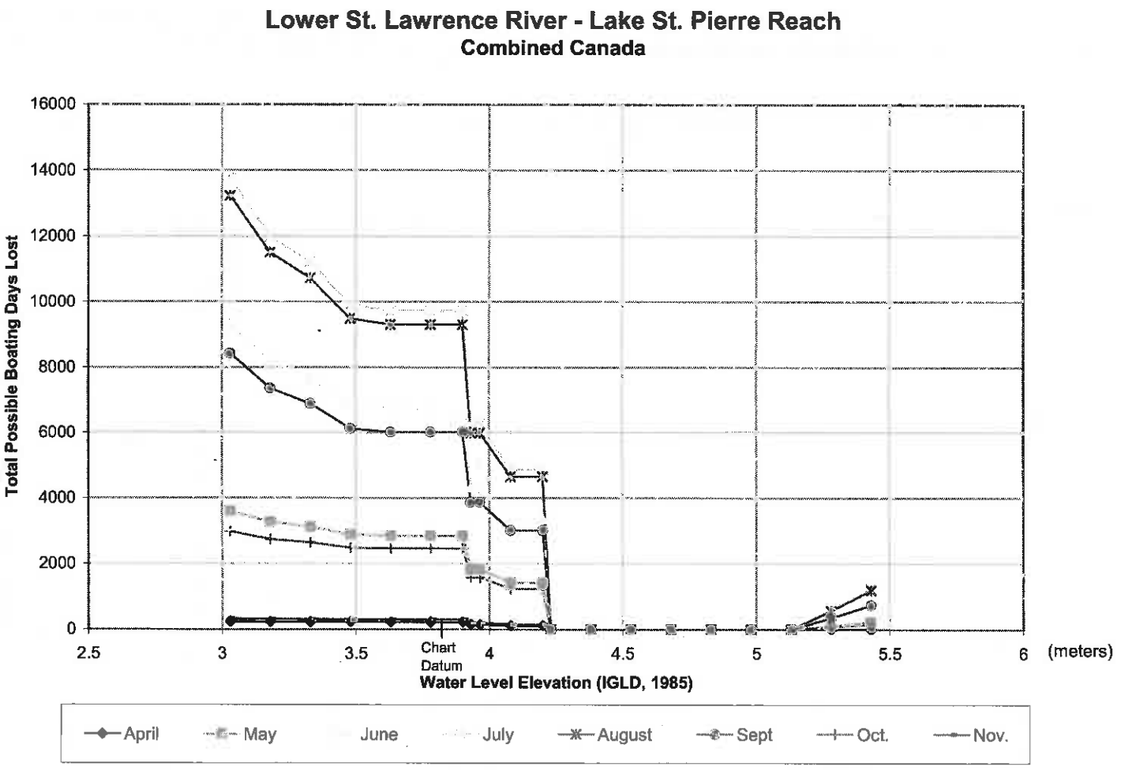

Figure 11. Water level – impact relationship using total possible boating days lost by month for all Canadian Lower St. Lawrence River – Lake St. Pierre Reach users.

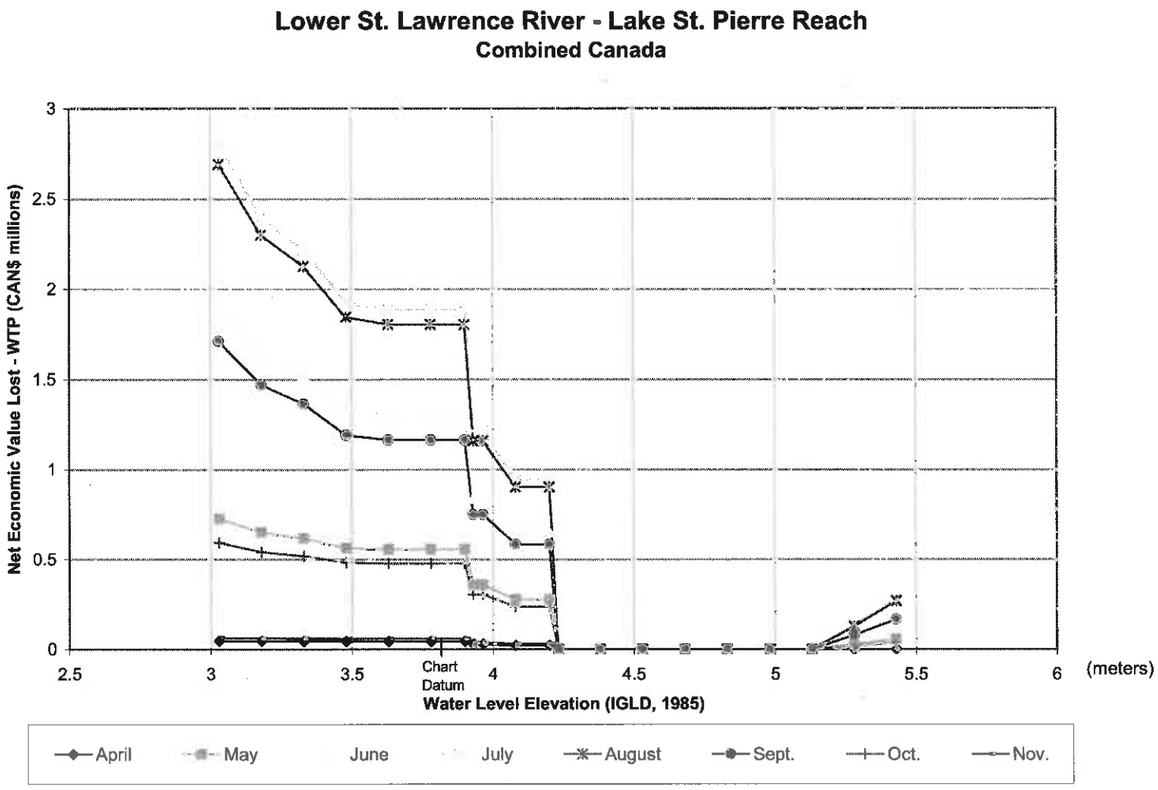

Figure 12. Water level – impact relationship using net economic values lost by month for all Canadian Lower St. Lawrence River – Lake St. Pierre Reach users.