



The Study Board received thirty-eight submissions during the public comment period. Questions and comments about the draft report, Impacts on Upper Great Lakes Water Levels: St. Clair River as well as the Study Board’s responses are available for download. All submissions have been included in their entirety (note: several lengthy submissions have been appended to the summary document) and are arranged by geographical location.

Extensive review by independent experts, agencies and organizations, scientists, engineers and concerned members of the public like you was a critically important part of the process. All independent peer reviews are also available for public review. For example, we are pleased to bring to your attention the comments provided to the International Joint Commission (IJC) by expert independent reviewers from both Canada and the United States:

"Overall, we find the analyses, results and conclusions to be technically sound and consistent with the Study objectives."

The final report to be released on December 15, 2009, includes extensive changes that reflect peer review and full consideration of all public input received on the draft report as well as additional research and analysis that was conducted this past summer. A synthesis of the public response to the Study’s draft report is available in the Public Interest Advisory Group Report on Public Outreach Activities.

Given the review process and its broad, multi-disciplinary approach, the Study Board is confident the final report is a sound scientific document that will guide future policy and management decisions. Moreover, the recommendations are the result of careful consideration of scientific information, exhaustive uncertainty analysis and respond specifically to the directive from the IJC.

Finally, please note that the International Joint Commission plans to hold public hearings regarding the report in the spring of 2010. These hearings provide another opportunity for the public to comment before any recommendations are made to the governments.

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Lake Michigan	
<p>1 Dear Study Board: I represent the Harbor Ridges Association, a group of over 100 Lake Michigan lakeside property owners in Baileys Harbor, WI. I would like to take this opportunity to comment on the St. Clair River Report draft and the public presentation made recently at Fish Creek, WI.</p> <p>We are disappointed in both the scope and conclusion of the draft report. The draft report is the most comprehensive study ever conducted on the Great Lakes, but was confined to the relatively short period of time from 1962 to the present. The report conclusion did not take into consideration the cumulative effects and impacts of prior dredging and other projects that have adversely impacted water levels.</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Study Mandate</u> The Directive from the International Joint Commission (IJC) specified that the Study Board’s mandate was to determine if there were ongoing changes in the river that might be affecting water levels in the upper Great Lakes. Changes prior to 1962 (by definition, not ongoing) have been studied in the past and impacts of previous dredging or other channel changes have been considered by the two governments. The two governments did agree to compensate for the 1962 dredging, though no remedial works were ever undertaken. Decisions not to remediate were influenced by water levels that reached record highs in the mid-1970s and mid-1980s, which were unprecedented despite 150 years of channel alterations. However, based on</p>

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<p>We are also disappointed that the conclusion to do nothing was based on the premise that increased outflow from Lake Michigan-Huron was within the limits of error. The increased outflow is equal to the flow of the Wisconsin River entering the Mississippi. The five inch decrease in Lake Michigan water levels due to increased conveyance acutely and negatively impacts navigation, recreational uses and property values. The only redeeming message we received from the public meeting in Fish Creek is that a Phase 2 has already been authorized. It is our understanding that Phase 2 will review various water level control alternatives for Michigan-Huron, conduct a cost effectiveness analysis, review environmental impacts and consider socio-economic implications as well.</p> <p>Past priorities of Great Lakes management have been focused almost exclusively on providing benefits to the shipping industry. The economic and environmental damage these activities have brought to the majority of Great Lakes users and riparian land owners far outweighs the benefits brought to the shipping industry.</p> <p>We believe it is time for a new management philosophy to take place and look forward to your agency taking a lead role.</p>	<p>concerns raised by the public, the St. Clair River Report does provide additional information regarding the scope of previous dredging projects.</p> <p>The difference in water levels between Lakes Michigan-Huron and Erie has declined by about 23 centimetres (cm) since 1962. Extensive investigations by scientists over the last three years have determined that this decline is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies.</p> <p><u>Study Findings and Recommendations</u></p> <p>Regarding the increased outflow value being within the limits of error, all scientific investigations are estimates of natural and man-made occurrences. Due to uncertainty, values which are plus or minus five percent of average values are considered within the margin of error of determination. The St. Clair River is about 63 km (39 mi) in length and extends from Lake Michigan-Huron to Lake St. Clair. Over this distance, the water level falls naturally about 1.5 m (5 ft). The average annual discharge of the river is about 5,150 m³ (181,900 ft³) a second or 118 billion gallons per day. The maximum conveyance capacity may have increased by as much as 290 m³ (10,200 ft³) a second which is about 5 percent or within the limits of error. However, lake levels adjust relatively quickly to a new equilibrium, with discharges roughly similar to the past. As a result, the notion of an additional 6 billion gallons per day flowing down the St. Clair River is an extreme overestimate, and the actual increase in flows is a small fraction of that amount. In addition, over the last decade, conveyance capacity has actually decreased slightly, meaning that less water, not more, is being discharged.</p> <p><u>Great Lakes Management Priorities</u></p> <p>Management of Great Lakes water levels has considered all interests, not just the needs of the navigation industry. There have been several reports on lake level studies by the IJC during the past few decades and each has attempted to balance the needs of all the users of the Great Lakes. Consistent with this philosophy, the second phase of the IUGLS is developing a range of plans to deal with climate change that will balance all upstream and downstream interests in the Great Lakes.</p> <p>Given the review process and its broad, multi-disciplinary approach, the Study Board is confident the final report is a sound scientific document that will guide future policy and management decisions. Moreover, the recommendations are the result of careful consideration of scientific information, exhaustive uncertainty analysis and respond specifically to the directive from the IJC.</p>

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2	<p>MANAGING LAKE WATER LEVELS FOR LAKES HURON AND MICHIGAN Subject: The concern of low water levels in Lakes Huron and Michigan because of natural erosion or dredging operations affecting the flow of the St. Clair River. Suggested Action: Study how the water volume flowing in the St. Clair River affects Lake Huron and Lake Michigan levels.</p> <p>The St. Clair flow volume could be studied by placing flow meters in a grid pattern across the active face of the river flow.</p> <p>Using the average of these flow rate (water current) readings multiplied by the active area of the St. Clair River, to give the approximate total of river water volume flowing.</p> <p>The volume of water lost from the St. Clair River, plus the surface evaporation of both lakes, losses from adjacent municipal domestic systems, etc., completes the water loss inquiry.</p> <p>Suggested Solutions: If the St. Clair River volume flow is determined excessive and a major cause of low lake levels, a solution would be a lock system in the river that would control or meter the flow of the river.</p> <p>Given the minimum amount of lake ships trafficking the Great Lakes Waterway, the lock gates would be opened and closed only two or three times daily for freighter traffic.</p> <p>Posting lock schedules on a daily basis of small pleasure boats would minimize additional cycling of the lock system.</p> <p>Discussion: Maintaining acceptable lake levels will reduce the costly dredging of harbors and allow heavier lake freighter shipping loads, and help eliminate other lake water level concern.</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Assessing Conveyance Changes in the St. Clair River</u> Numerous investigations have taken place over the last three years to determine if the conveyance or water-carrying capacity of the St. Clair River has changed, to assess if there is ongoing erosion in the river bed and to identify other factors that may be affecting water levels. Some of these investigations have used two-dimensional models which use average velocities over river cross-sections to determine the volume of water or the flow rate. To verify the calculated flow rates, flow meters were installed along the river. The operation of these flow meters will continue after the Study is complete.</p> <p>The difference in water levels between Lakes Michigan-Huron and Erie has declined by about 23 centimetres (cm) since 1962. Extensive investigations by scientists over the last three years have determined that this decline is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies.</p> <p><u>Study Findings and Recommendations</u> Since the Study Board determined that the conveyance changes were relatively small, and there is evidence that the conveyance actually has been decreasing in the past decade, the Board determined that remedial actions, such as new locks or control structures, are not warranted and their detailed design is beyond the scope of the Study.</p> <p><u>Lake Level Fluctuations</u> Lake levels are largely determined by climate variability. Maintaining lake levels at an average level is impossible, as the lake levels fluctuate widely – especially during flood and drought periods. No degree of regulation can change that physical reality.</p>
3	<p>I am a resident of North Shore Milwaukee and attended the Water Levels Public Meeting in Mequon, Wisconsin on July 8, 2009. I am offering the following as comments in follow-up to this meeting.</p> <p>1. The draft report indicates that a dramatic change in conveyance in the mid-1980's may be attributable to a one-time event, possibly a major ice dam. IUGLS Group representatives indicated at the Public Meeting that this event lasted approximately 3-4 weeks and acknowledged, when pressed, that human activity, such as dredging or ice-breaking, could cause or exacerbate ice dams, including the major dam of</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Natural and Human-Mediated Changes in the St. Clair River</u> At a technical level, the notion of remediation is limited to addressing damages caused by past actions of man, such as dredging. Generally, remediation is not considered when the cause is natural because there would necessarily be additional damages associated with altering natural processes. The Board originally determined that this was another factor, but not a key factor for not recommending remediation. Based on the public response and further clarification from the IJC has lead to this distinction being dropped. The relatively small magnitude of the change, combined</p>

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<p>1984.</p> <p>The draft report clearly presents the ice dam as a strictly natural event. In the summary of the draft report it states in fact that "past changes are likely attributable to natural forces and not human actions." On this basis ("these findings") the suggestion is made that remedial measures are not warranted at this time. However, as IUGLS representatives said, while the ice dam may be natural, the cause of it may not be. So it may be that this needs to be examined further as a possible human-caused event.</p> <p>I suggest that it would be beneficial to acknowledge in the final report that ice dams, including the dam in the mid-1980's, can be caused by or exacerbated by human activity such as dredging or ice breaking. To not do so I believe would be misleading, based upon the statements of IUGLS representatives. And, I suggest that consideration should be given to monitoring ice dam activity and causes on an ongoing and future basis.</p> <p>2. Several parties at the Public Meeting raised the over-riding concern that the conclusions of the IUGLS and the Baird Report are very different, and are not being adequately acknowledged or addressed (with Baird putting far more weight on the role of human-caused factors). IUGLS representatives at the Public Meeting indicated that they were optimistic that differences in the reports would be addressed and reconciled because both parties relied upon the same available data and used the same modeling.</p> <p>In recent news reports it has been stated that the IUGLS Study Group says that they did not use the same approaches.</p> <p>Can this be reconciled? In the final report it would be very useful to the concerned readers and greatly enhance the credibility of the IUGLS Report if there is a complete general and technical discussion of why there are differences in conclusions, including modeling, and how they have been reconciled or resolved.</p> <p>I share and support the feelings of many who give great credit to the shoreline property owners of Huron and to the Baird Report for bringing this issue to light, and wish to see the Baird Report(s) receive full response. This would serve to reassure those of us in the public that full disclosure and transparency of approaches has been provided.</p> <p>3. In the presentation at the Public Meeting, and presumably in the upcoming final report, the "next steps" indicate ongoing and future tracking of possible natural (or other?) conditions which would require possible future mitigative action. Going forward, rather than retracing steps, seems to be the thrust, given the current</p>	<p>with the large uncertainty around the number was the key consideration. The fact that the change was not on-going and in fact based on the later data, which are more reliable, indicates that there has been a small decrease in conveyance factored into the decision. In addition, since variations in climate patterns affecting water supplies, and not changes in conveyance capacity, were found to be the major cause of lower levels, it was beyond the mandate of the Study Board to recommend remediation for a cause other than ongoing physical change in the bed of the river.</p> <p><u>Assessing the Impacts of Ice Jams</u></p> <p>Ice jams can affect the conveyance of water in a river since hanging ice dams, which form under the ice, can temporarily reduce the flow cross-section and potentially increase flow velocities in the vicinity of the jam. Initial investigations raised the possibility that the 1984 ice jam resulted in an increase in river velocities under the ice potentially scouring the channel bottom. Additional studies done recently, however, have indicated that the channel capacity was likely not altered significantly by the ice jam and that such events alone have no long-term impact on water levels. The Study Board is confident in the finding that the conveyance of the St. Clair River changed sometime in the mid-1980s as this conclusion is based on several different lines of evidence and statistical analyses. There were a number of important and unusual events affecting water levels in that period of a few years, including the record ice jam of 1984, followed by the record high water levels of 1986 and culminating in a severe basin-wide drought in the upper Great Lakes in 1988. Studies of ice control measures, such as ice booms, will continue in the next phase of the Study.</p> <p><u>Study Board Response to the Baird Report</u></p> <p>The investigations performed for the IUGLS were based on sound science by nearly one hundred investigators. The methods and data utilized and the resulting findings were examined in an extensive independent peer review process which found all investigations to be appropriate and sufficient to address the questions posed. The purpose of the Study was not to refute the findings of the Baird report nor to question the data and techniques that they used, but to undertake independently a much broader range of analyses than Baird was able to mount, with a considerable wealth of new data and measurements. Baird did not have much of the newer data available for their analyses. Even though both studies used the same models, the data were not consistent. The differences in the modeling approaches have been thoroughly discussed in the final report. Finally, it is important to note that Baird's report was never peer-reviewed, while key IUGLS reports were independently reviewed and found to be well within accepted scientific norms. The Study Board has provided a detailed critique of the Baird Report which is available on the Study website.</p>

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<p>stability of the conveyance and the lack of erosion. At least in the presentation, this intent could have been described in more depth so that those of us who are in the general public are really able to understand what comes next. So, let me suggest that "where we go from here" warrants thorough discussion in the final report.</p> <p>Thank you for your consideration of the above comments.</p>	<p><u>Study Findings, Recommendations and Next Steps</u></p> <p>Largely due to similar requests received during the public comment period for more information about "where to go from here," the final report includes a discussion of the next phase of the Study as well as a thorough review of the Board's rationale for its findings and recommendations, which have significant implications for future work to be done.</p>
<p>4 Submission from: Great Lakes Coalition: Michigan/Lake Michigan Chapter for Shoreline Preservation</p> <p>Dear Study Board Members:</p> <p>The International Great Lakes Coalition is a non-profit association of several thousand lakeshore property members who live along the Great Lakes. We have studied the Draft Report of the International Upper Great Lakes Study and would like to offer the following comments.</p> <p>We think the study was professionally done; it thoroughly investigated all aspects of the St. Clair river situation. We are in complete agreement with the recommendation that no action be taken because the changes that have taken place are due to natural causes and the long term history of Great Lakes water levels and corresponding impacts do not justify it.</p> <p>Furthermore, lake levels are coming up, and are now close to their long term averages. This is not the time to install structures to decrease the flow through the St. Clair River for the purpose of increasing the levels of Lakes Michigan/Huron.</p> <p>If anything was done to raise lake levels, our members are afraid that it would mean higher levels than ever before when the next cycle of high water occurs. Extremely high levels are a real possibility again: after all, the high level in 1997 was only 12 years ago, and it occurred after the 1984 erosion of the river bed had already taken place. Prior to that, we had 30 years of almost continuously high levels, setting record high levels in 1986.</p> <p>Even if restrictions were removed when high levels returned, it could take two years for levels to reach a new stable equilibrium again, according to statements at the public meetings.</p> <p>If you don't live on the lakeshore, you can't understand or measure the anxiety and mental anguish one suffers when he sees his property being threatened or lost. The loss of the Great Lake's beaches around the State of Michigan and as a result of high water levels has a devastating impact on the state's tourism economy and the quality of life of its residents.</p>	<p>As you point out and as the Study Board has determined, the recent low water levels on the upper Great Lakes are primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies. Similar periods of low water levels occurred in the 1930s and 1960s and may occur again. Moreover, periods of high water levels might also occur again, just as they did in the 1970s and 1980s when record highs were reached despite 150 years of changes to the connecting channels. As a result, any change in regulation or potential mitigation measure must be robust under all scenarios and take into consideration all interests and users of the Great Lakes.</p> <p>Given the review process and its broad, multi-disciplinary approach, the Study Board is confident the final report is a sound scientific document that will guide future policy and management decisions. Moreover, the recommendations are the result of careful consideration of scientific information, exhaustive uncertainty analysis and respond specifically to the directive from the IJC.</p> <p>Finally, please note that the International Joint Commission plans to hold public hearings regarding the report in the spring of 2010. These hearings provide another opportunity for you to comment before any recommendations are made to the governments. Given your long experience and involvement in previous Great Lakes water levels studies, we hope your voice will continue to be heard.</p>

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<p>Therefore, we believe in letting nature alone. Don't compensate. In the past, nothing was done to compensate for man-made activities like the Chicago diversion, the in-diversion of the Canadian Rivers, Long-Lac and Ogoki, or for restrictions in the Niagara River. Why do anything now?</p>	
<p>5 I am concerned about this expensive study you are having for the Great Lakes. I am 88 years old and the lakes rise and they fall. There is a cycle. Remember at one time the beach is long and other times the beach is short and houses built too close to the lake fall in. That is the person's fault.</p> <p>Why are you trying to change and spend millions of dollars on something God has control over? Let nature do its thing.</p> <p>I hope you never send water out west. Also I am sorry so much waste and garbage is being dumped into the lake.</p> <p>Also, why can Grand Rapids get their sewer system worked out? I have seen that brown stuff going down the Grand Haven channel and entering Lake Michigan. What a shame – we are so smart we are dumb.</p> <p>Too many of you are too young to know how the lakes work. It isn't an over-night affair – it is a year's affair.</p> <p>I appreciate what studies (some) because we have far too many people now and things change – but rise and fall of the lakes man will not change.</p> <p>I am late with this letter – please do not throw it away until you read it 2x. Even a reply would be nice.</p>	<p>As you so correctly point out, water levels of the Great Lakes go through periods of high water and low water due to variations in climate patterns affecting water supplies. Phase 1 of the Study determined that the declining water levels on Lake Michigan-Huron are primarily due to factors such as hydroclimatic variability. The next phase of the Study will concentrate on identifying alternatives to Plan 1977-A, the present Lake Superior outflow management plan, in order to take into consideration changing interests and the range of hydrologic conditions that will inevitably occur. The Study Board approach is designed to balance the needs of all the users of the Great Lakes.</p> <p>Given the review process and its broad, multi-disciplinary approach, the Study Board is confident the final report is a sound scientific document that will guide future policy and management decisions. Moreover, the recommendations are the result of careful consideration of scientific information, exhaustive uncertainty analysis and respond specifically to the directive from the IJC.</p> <p>Finally, please note that the International Joint Commission plans to hold public hearings regarding the report in the spring of 2010. These hearings provide another opportunity for you to comment before any recommendations are made to the governments.</p>
<p>6 Dear Study Board:</p> <p>I appreciate the opportunity to comment on the comprehensive study of the situation in the St. Clair River as part of the Upper Great Lakes Study.</p> <p>The study encompasses large diverse areas which impact many interests. After reviewing the study and recommendations, I fully support all aspects of the report. I'm especially concerned that any changes that raise lake levels would have a tremendous effect on the sandy and fragile beaches and shorelines of Lake Michigan.</p> <p>Seeing the changes daily, weekly, monthly and yearly for many years, gives one a firsthand perspective of the situation.</p> <p>While experiencing high water for thirty years (each time coming back higher than before), I experienced first hand the devastation and psychological stress that high</p>	<p>The Great Lakes go through periods of high water and low water due to variations in climate patterns affecting water supplies. Each can have an impact on the shoreline, especially in areas of erodible beaches and bluffs. The second phase of the Study will investigate coastal processes including flooding, erosion and how shore protection is affected by changing water levels. Alternative regulation plans will be identified that take into consideration changing interests and the range of hydrologic conditions that will inevitably occur. Erosion and flooding are natural processes and no man-made measures will prevent them from occurring. Wise shore management is the only measure that can significantly reduce losses.</p>

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<p>water can cause. I saw the wonderful resources of our beautiful beaches turned into something that looked like a war zone, toppled 100 to 150 year old trees, the shoreline littered with debris and no beach at all. Watched an elderly neighbor's home topple into the lake (couldn't afford shore protection). Saw twenty-five feet of newly placed seawall of my other neighbor go out with one wave. He stood there pale looking and said, I'm so exhausted! I'm out of money! He began to cry. The power of water is shocking. The loss of the use of the beaches is such a loss to everyone.</p> <p>All of your efforts are deeply appreciated.</p>	
<p>7 Submission from: Wisconsin Great Lakes Coalition</p> <p>Dear Board Members:</p> <p>The Wisconsin Great Lakes Coalition is an organization of shoreline property owners and taxpayers on the Wisconsin side of Lake Michigan. There are about 30,000 of us. We have reviewed the draft report of the study of the St. Clair River and offer the following comments:</p> <ul style="list-style-type: none"> - The study appears to have been conducted properly given the short time allowed to do it. Yes there is some data from previous studies that appears flawed but in our opinion does not bear on the present situation. Note that the ice jam which occurred in 1984 is widely suspected of causing an increased loss of water from the lakes, but only two years later, in 1986, Lakes Michigan/Huron reached their all-time record high levels. It seems that other factors were at work here which we still do not fully understand. - The St. Clair River part of the study was begun about two years ago when the lakes were approaching record low levels. Today, the lakes have risen almost two feet and are within six inches of their seasonal average. We do not understand how this happened especially since nothing has been done to the river to reduce flow. - Lakeshore erosion has begun. After several years of low water levels, dunes began to form on the beach. Those dunes are now being destroyed by the rising waters. <p>We do not understand all the factors affecting lake levels to make an intelligent decision on what should be done. Therefore, we are totally in agreement with the study recommendations that nothing be done to the St. Clair River at this time, and nothing should be done in the future that would raise water levels in Lakes Michigan/Huron. Let nature operate as normally as possible. Thank you.</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Assessing the Impacts of Ice Jams</u></p> <p>Initial investigations raised the possibility that the 1984 ice jam resulted in an increase in river velocities under the ice causing a scouring of the channel bottom. Additional studies done recently, however, have indicated that the channel capacity was likely not altered significantly by the ice jam and that such events alone have no long-term impact on water levels. The Study Board is confident in the finding that the conveyance of the St. Clair River changed sometime in the mid-1980s as this conclusion is based on several different lines of evidence and statistical analyses. There were a number of important and unusual events affecting water levels in that period of a few years, including the record ice jam of 1984, followed by the record high water levels of 1986 (as you note) and culminating in a severe basin-wide drought in the upper Great Lakes in 1988.</p> <p><u>Lake Level Fluctuations and Impacts</u></p> <p>Extensive investigations by scientists over the last three years have determined that the difference in water levels between Lakes Michigan-Huron and Erie is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies.</p> <p>Although the upper Great Lakes recently went through a low water period, very similar to one that occurred in the 1930s, conditions can change rapidly. The recent recovery to levels closer to average is the result of higher precipitation in parts of the region that had been quite dry for several years.</p> <p>Erosion of beaches is a natural occurrence that can happen under both high and low water levels, especially when subject to storm activities. The beaches may rebuild again when water levels decline.</p>
Lake Huron	
<p>8 I am writing to protest the negligence you have shown with regards to water levels in Lake Huron and our beloved Lex Cheneaux Islands. Quit siphoning off our precious</p>	<p>As you so correctly point out, water levels of the Great Lakes go through periods of high water and low water due to variations in climate patterns affecting water</p>

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<p>water. Without it, we die.</p> <p>I am 62 and own 5 lots on Coryell Island. My grandfather Horsburgh started summering in Cedarville and Coryell Island in 1917. We have never missed a year in 92 years. To date the Horsburghs are 63 strong, own 7 houses and 35 boats. We all summer there, pay taxes, buy goods and services and support the Les Cheneaux Islands.</p> <p>In 2008 my children and I personally spent \$35,000 for upkeep, maintenance and taxes on our properties on Coryell Island. My cousins on Marquette and Boot Islands spent even more. My uncle Ken Horsburgh began the Antique Boat Show in Hessel, Michigan 27 years ago. He also started the Ensign Sail boat craze so that now no fewer than 40 Ensigns sail in the Lex Cheneaux waters. Our family was one of the main contributors of the Cedarville library, a showpiece for the entire community. My family alone financially supports hordes of people in the upper Peninsula because we love “the Snows” as do our children and grandchildren. But, now with water levels precariously low, that legacy is about to be lost. Cedarville Mi looks like a ghost town due to the low water levels. It was more active post world war II than it is now due to the fouled waters.</p> <p>I have seen water levels rise and fall cyclically over years but never has it fallen so low as in recent years. I have a beautiful boathouse and miles of docks (which we pay locals to maintain throughout the years) but water is getting so low it is questionable if we can continue to use it.</p> <p>Please do something about it. Quit stealing our water such that it affects the water table. It is dangerously low. My family has been loyal and dedicated over the years. Where is your loyalty?</p> <p>With global warming everyone else is worried the water levels are rising. But not in the Les Cheneaux due to something I do not understand in the St Clair River. God, please let our water levels go back up. We need the water.</p> <p>Please help us! Thank you.</p>	<p>supplies. Phase 1 of the Study determined that the declining water levels on Lake Michigan-Huron are primarily due to factors such as hydroclimatic variability. Over the last decade, the upper Great Lakes experienced an extended low water period, which remarkably resembled a similar low water period that occurred during the 1930s. The recent recovery to levels closer to average is the result of higher precipitation in parts of the region that had previously been quite dry for several years. Maintaining lake levels at an average level is impossible, as lake levels fluctuate widely – especially during flood and drought periods. No degree of regulation can change that physical reality. The next phase of the Study will concentrate on identifying alternatives to Plan 1977-A, the present Lake Superior outflow management plan, in order to take into consideration changing interests and the range of hydrologic conditions that will inevitably occur.</p> <p>Water is not being siphoned or diverted from the Great Lakes. The Great Lakes Compact, which was enacted by the eight Great Lakes states and two Canadian provinces, prevents diversions of water from the Great Lakes. The Chicago Diversion removes water from Lake Michigan at a rate mandated by the United States Supreme Court. But water that enters the Great Lakes from the Hudson River Basin through the Long Lac and Ogoki Diversion to Lake Superior exceeds the amount leaving the lakes at Chicago. As a result, the net impact of these diversions on Great Lakes levels is small.</p>
Lake Erie	
<p>9 I attended the IUGLS presentations in Toledo and Cleveland and reviewed the draft report and project summaries. I am a life-long resident of Northern Ohio, a Great Lakes boater for 40 years, and a lakefront property owner for 18 years. I was, in general, positively impressed by the preliminary results to date. It is clearly a vast improvement over the control algorithm that has governed the control of the Lake Superior outflow for the past several decades. I hope that the results of the</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Study Findings and Recommendations</u></p> <p>As you mention, the Study concluded that the variations in climate patterns affecting water supplies is the primary cause of the difference in water levels between Lakes Michigan-Huron and Erie. In the next phase, the Study Board will propose an</p>

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<p>multiple studies will be applied to the improvement of the IJC control algorithms. I do not believe that control structures in the St. Clair River are advisable at the present time and I am deeply concerned that the impact of any such structures on Lake Erie has not been fully evaluated. Lake levels should be allowed to follow their natural seasonal patterns to the extent possible with the minimum amount of human intervention.</p> <p>There is clearly a conflict between the interests of various lake users as well as conflicts between similar users in different areas. For example, what is good for Georgian Bay property owners is bad for property owners along the Michigan/Lake Michigan coastline and any changes will clearly affect all users of the Great Lakes.</p> <p>I believe that the most valuable portions of the present study were those dealing with climate change and isostatic rebound. The climate change segments clearly indicated the shortcoming of the Residual NBS determination approach that has been used for decades. I hope alternate approaches will be adopted.</p> <p>The change in calculation methods for isostatic rebound using the basin outlet locations rather than basin averages is also an improvement over past practice. Isostatic rebound is a fact of nature that all residents must live with. It should be pointed out that Edwin Moseley looked at Isostatic rebound along the south shore of Lake Erie more than a hundred years ago. He predicted that Port Clinton Ohio would be underwater by now. He was wrong. In the future, the science of GPS should allow more and more accurate evaluations/predictions of rebound as the science develops. I hope it will be used to its fullest capability.</p> <p>The least encouraging portion of the presently used science is the continued use of outdated and inappropriate approaches for evaluating the river flow conditions. The use of "Manning's equation" for control purposes by the IJC is inappropriate. When Manning derived it 120 years, he established its limits of applicability and these are not met by the conditions of the St Clair River. The so-called "weed factors" and "ice factors" seems to have little correlation to what actually exists in the rivers. I see little value in the high resolution static analysis of a highly dynamic river system which is poorly understood even at a gross level.</p> <p>Hopefully, a specific recommendation of the study will be to implement a new control algorithm for the Lake Superior outflow with a closer connection to actual conditions in the rivers and over the lakes and their watersheds.</p> <p>Thank you for the opportunity to submit my comments.</p>	<p>adaptive management strategy linking improved outflow management from Lake Superior related to climate change and variability taking all interests into consideration.</p> <p>The Study's findings indicated that the increase in the conveyance or water-carrying capacity of the St. Clair River is not ongoing, and based on bathymetry from 2000 to 2007, conveyance capacity has slightly decreased. In addition, the overall increase in conveyance capacity since 1971 is small relative to the degree of scientific uncertainty associated with the various analyses and data measurements. Furthermore, the conveyance change is likely the result of a combination of factors, rather than any single factor. Investigation of the ability to adjust flows in the St. Clair River related to the next phase of the Study regarding improved Lake Superior outflow management may consider structural changes, but their impact on downstream water levels – Lakes St. Clair, Erie and Ontario and the St. Lawrence River – will have to be carefully assessed.</p> <p><u>Study Methods</u></p> <p>Regarding your comments on the use of Manning's equation, as you point out, the ability of the equation to estimate natural conditions is based on the precise determination of Manning's "n" which is a function of channel roughness and other conditions. In a system as large and deep as the St. Clair River, Manning's "n" is an estimate, at best. Its use was one technique used to determine conveyance changes, but several other 1-, 2- and, in very specific locations, 3-dimensional hydraulic modelling techniques were used to provide redundancy in the investigations. This approach provided additional confidence in the results of the Study, since all methods converged on a fairly small range of answers. In fact, 15 different analyses from three different perspectives all found a common direction and magnitude of conveyance change, with a range in the order of 7-14 centimetres (cm).</p>

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10	<p>To Whom It May Concern:</p> <p>After reading the summary report I am vividly reminded of the hundreds of "scientific" reports and articles published in dispute of Global Warming (now correctly termed Climate Change) from 1983 through 2008. The late Carl Sagan as well as a host of other prominent scientists testified before Congress at the 1983 and 1984 initial hearings regarding Global Warming. We knew then what we only now admit a full twenty-five years later!</p> <p>I am not a scientist or expert in any relevant field, but I do have the luxury of experience and wisdom paid for through age and errors. We have fully accredited college professors teaching students that the earth is only 6000 years old (as believed by one of the finalist for the 2008 U. S. Presidency.) While I am not suggesting that the IUGLS falls into a pathetic class of non-science such as Creationism, your study certainly reminds me of the 25 year denial of Climate Change.</p> <p>Mike Mahoney of the Les Cheneaux Islands Association recently stated in his assessment of your study and the reported increased loss of six billion gallons per day through the St. Clair River by saying, ""...they are analyzing their noted 5% increase in conveyance, to be certain that 6 billion gallons per day is not in the ""Range of Uncertainty"". "" Is this going to take 25 years?</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Assessing Conveyance Changes in the St. Clair River</u> The St. Clair River is about 63 km (39 mi) in length and extends from Lake Michigan-Huron to Lake St. Clair. Over this distance, the water level falls naturally about 1.5 m (5 ft). The average annual discharge of the river is about 5,150 m³ (181,900 ft³) a second or 118 billion gallons per day. The maximum conveyance capacity may have increased by as much as 290 m³ (10,200 ft³) a second which is about 5 percent or within the limits of error. However, lake levels adjust relatively quickly to a new equilibrium, with discharges roughly similar to the past. As a result, the notion of an additional 6 billion gallons per day flowing down the St. Clair River is an extreme overestimate, and the actual increase in flows is a small fraction of that amount. In addition, over the last decade, conveyance capacity has actually decreased slightly, meaning that less water, not more, is being discharged.</p> <p><u>Study Findings and Recommendations</u> Based on 15 different analyses conducted by experts from multiple scientific disciplines, the Study determined that a series of changes to the river bed increased the conveyance somewhat, accounting for about 7-14 centimeters of the drop in head (difference in water levels) between Lakes Michigan-Huron and Lake Erie since 1962. Using extensive bathymetric data that was collected in support of this Study, the Study Board also determined that the river bed has been fairly stable since 2000 with actually a small decrease in conveyance capacity, indicating the riverbed is accreting and not eroding.</p>
11	<p>The attached petitions are submitted to the IJC's Upper Great Lakes Study Board at its public meeting in Cleveland, OH in response to its St. Clair River Report. The originals will be sent to the U.S. State Dept and Canadian Dept of Foreign Affairs. <i>[note: 9 signed petitions were submitted].</i></p> <p>Petition to the United State Department and the Canadian Department of Foreign Affairs</p> <p>We the citizens of the Great Lakes are extremely disappointed in the Draft Report of the International Joint Commission's International Upper Great Lakes Study Board "Impacts on Upper Great Lakes Water Levels St. Clair River" for the following reasons:</p> <ol style="list-style-type: none"> 1. This is not the transparent process that we expect of work carried out with taxpayers dollars. We have no access to the reports or peer reviews that were carried out over the past two years. 2. The Study Board has admitted that there are reports in the possession that are not included or even referenced in this report. Why not? 3. There is critically important work that is being carried out this summer that should have been completed before submitting this Report for public 	<p>The Study Board offers the following response to your comments:</p> <p><u>Availability of Peer Reviews and Technical Reports</u> In the fall of 2007, when water levels were quite low, there was much interest from the public and from elected officials in accelerating the St. Clair River portion of the Study and moving up the spring 2010 publication date of the draft report. Therefore, with the approval of the International Joint Commission and the Public Interest Advisory Group, the draft report, <i>Impacts on Upper Great Lakes Water Levels: St. Clair River</i>, was released nearly one year ahead of its original schedule. The decision to accelerate the Study was not taken lightly, and there was much discussion and effort involved in maintaining the integrity of the science. To accommodate the revised schedule, the public comment and the peer review periods were scheduled to occur concurrently. The Study Board is confident that this timeline was the most appropriate given the time constraints placed on the process.</p> <p>The International Joint Commission and Study Board recognized the need for the Study to be scientifically credible and transparent given the diverse interests concerned with Great Lakes water levels, the complexity of many of the scientific and</p>

SUBMISSION	STUDY BOARD RESPONSE
<p>comment. We are referring to assessing the impact of maintenance dredging in the St. Clair River and the placement of shoreline structures on the south shores of Lake Huron. Both activities have likely contributed to the increase in the conveyance of the river. The results of that work could change the conclusions and recommendations. To conclude that the increased conveyance is entirely due to natural causes is premature at best and misleading at worst.</p> <p>4. We disagree that the Study Board does not have the mandate to recommend remediation if the increased conveyance is due to natural causes. Their directive says; “examine physical processes and possible ongoing St. Clair River changes and its impacts on levels of Lake Michigan and Huron. Additionally, depending on the nature and extent of St. Clair River changes and impacts, recommend and evaluate potential remedial options.”</p> <p>5. The St Clair River has a long history of dredging, sand and gravel mining and shoreline alterations that have changed the river forever to the point that the channels are now over 60 feet deep in places. Beginning in 1917, many times remediation options have been designed, approved and funds appropriated but the projects were never completed. We think the time is right to finally address this longstanding increased outflow with flexible measures such as installing submerged turbines that could reduce the outflow when appropriate and generate green energy.</p> <p>We request that you direct that the IJC set up a Great Lakes Coordinated Outflow Control Board for all the lakes so that the entire system is managed in a responsible manner facing climate change. Since Lakes Michigan, Huron and Erie are likely to suffer the most impact from climate change due to loss of ice cover resulting in increased evaporation, it is imperative that control measures for the outflow of Lakes Huron and Erie be managed responsibly so that Lake Superior’s control gates are used to address only Lake Superior needs.</p>	<p>engineering studies required, and the uncertainty associated with the outcomes. As a result, the Study review process requires that every level of research conducted under the IUGLS adhere to a high level of scientific rigor. The process includes both internal reviewers from among Study scientists and engineers – involving the Technical Work Groups, the St. Clair River Task Team and the Study Board – and external reviewers who are independent of the Study. In this regard, the IJC contracted with the Environmental and Water Resources Institute (EWRI) of the American Society of Civil Engineers (ASCE) and with the Canadian Water Resources Association (CWRA) to provide independent peer reviewers who are experts in their respective fields. The review process was managed by the IJC at arm’s length from the Study to maintain the integrity of the process.</p> <p>As part of the St. Clair River Study, more than 40 technical research projects were commissioned. Two weeks after the release of the draft report, <i>Impacts on Upper Great Lakes Water Levels: St. Clair River</i>, Volume II of the report was made available. Volume II contained 2-3 page summaries of all of the science reports appended to the draft report. As peer reviews (internal and external, depending on the specific report) were completed, the full reports were also made available on the Study website.</p> <p>The full draft report, three key science chapters and eight specific technical reports were submitted for independent peer review last spring (12 documents, 24 reviews as there is one reviewer from each country reviewing each report). A complication arose when the external independent peer reviews took much longer than anticipated. However, since the public will have another opportunity to submit questions and comments to the IJC next spring, the Study Board thought that soliciting public comment on the draft report prior to publication of all of the peer reviews was an acceptable course of action. What is important to highlight is that the final report submitted to the IJC reflects the peer reviews and public comments received as well as the results of additional research conducted over the summer.</p> <p><u>Natural and Human-Mediated Changes in the St. Clair River</u></p> <p>At a technical level, the notion of remediation is limited to addressing damages caused by past actions of man, such as dredging. Generally, remediation is not considered when the cause is natural because there would necessarily be additional damages associated with altering natural processes. The Board originally determined that this was another factor, but not a key factor for not recommending remediation. Based on the public response and further clarification from the IJC has lead to this distinction being dropped. The relatively small magnitude of the change, combined with the large uncertainty around the number was the key consideration. The fact that the change was not on-going and in fact based on the later data, which are more reliable, indicates that there has been a small decrease in conveyance factored into the decision. In addition, since variations in climate patterns affecting water</p>

SUBMISSION	STUDY BOARD RESPONSE
	<p>supplies, and not changes in conveyance capacity, were found to be the major cause of lower levels, it was beyond the mandate of the Study Board to recommend remediation for a cause other than ongoing physical change in the bed of the river.</p> <p><u>Study Mandate</u></p> <p>The Directive from the International Joint Commission (IJC) specified that the Study Board's mandate was to determine if there were ongoing changes in the river that might be affecting water levels in the upper Great Lakes. Changes prior to 1962 (by definition, not ongoing) have been studied in the past and impacts of previous dredging or other channel changes have been considered by the two governments. The two governments did agree to compensate for the 1962 dredging, though no remedial works were ever undertaken. Decisions not to remediate were influenced by water levels that reached record highs in the mid-1970s and mid-1980s, which were unprecedented despite 150 years of channel alterations. However, based on concerns raised by the public, the St. Clair River Report does provide additional information regarding the scope of previous dredging projects.</p> <p>According to the comprehensive bathymetric surveys undertaken since 2000, there is no evidence of ongoing erosion in the St. Clair River. With the available data, it is not possible to determine when the period of stable morphologic regime began, but it coincides with the relatively low lake levels of the past decade.</p> <p><u>Study Findings, Recommendations and Next Steps</u></p> <p>The Study Board reiterates its recommendation that no remedial actions be undertaken to compensate for conveyance changes in the St. Clair River at this time, given that the increase in the conveyance or water-carrying capacity of the St. Clair River is not ongoing, and based on bathymetry from 2000 to 2007, conveyance capacity has slightly decreased. In addition, the overall increase in conveyance capacity since 1971 is small relative to the degree of scientific uncertainty associated with the various analyses and data measurements. Furthermore, the conveyance capacity change is likely the result of a combination of factors, rather than any single factor.</p> <p>Phase 2 of the Study may consider control structures in the connecting channels as part of its investigations to improve Lake Superior outflow management to address climate change and variability. However, detailed design studies of possible control structures are beyond the scope of the Study. Also, based on expert consultation, such detailed studies and design and construction of control structures would likely take considerable time to complete and would have to consider carefully the impacts on both upstream and downstream interests.</p>

SUBMISSION	STUDY BOARD RESPONSE
Georgian Bay	
<p>12</p> <ol style="list-style-type: none"> 1. What is the quantity of water that goes into the lakes during a year? 2. What is the quantity of water that evaporates from the lakes during a year? <p>MY THOUGHTS</p> <p>It amazes me to see how low the water level in Georgian Bay is, compared to what it was back in the 19 fifties and sixties. It is obvious to everyone that the water level in the lakes will fluctuate according to the amount of water going in and the amount going out.</p> <p>Precipitation is the one and only source of water that replenishes the water quantity of lakes, but there are two different ways in which the water can come out of the lakes.</p> <p>The first method is the outflow through rivers that take the water to lakes that are at a lower elevation. The rivers that take the water from the Great Lakes are monitored and I assume controlled quite effectively.</p> <p>The second method is evaporation directly from the surface of the lake, vegetation can also absorb some of the water in the shore areas and then expel the water through the leaves into the atmosphere.</p> <p>I assume that the outflow of water from the Great Lakes has been controlled very effectively for many years but despite such control the water levels has decreased. That fact leads to the assumptions that either there has not been enough precipitation or the amount of water evaporation has increased.</p> <p>If the rainfall and snow fall records are available for the past 60 years, then from that it could be determined if the precipitation has decreased by such a large quantity over the years. If the rainfall amount has remained stable over the years and the outflow has been controlled properly, then the assumption is that the lake water levels have gone down due to the increased amount of evaporation.</p> <p>There are two factors that determine the evaporation rate of water, one is the temperature of the water and the other is the air pressure against the water surface. The question then is; has either or both of these values changed over the period of sixty years. Is there such information available for the past 60 years?</p> <p>Without accurate information one can only hypothesize the following scenario. Since the nineteen fifties the two effects of warming of the water and the reduction of the atmospheric pressure has happened simultaneously and since the year 2000 the effect has increased so that more than the normal quantity of water has evaporated.</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Lake Level Fluctuations</u></p> <p>The amount of water entering and leaving the Great Lakes is a function of surface runoff to the lakes, groundwater, over-lake precipitation, evaporation and evapotranspiration. This is the net basin supply to each lake. The net total supply also includes the inflow from the upper lake to the next downstream lake through Great Lakes connecting channels. Throughout the available historic record of water level data (1860 through the 2008), variable water supplies have been responsible for the low levels that occurred in the 1930s, 1960s and late 1990s to mid-2000s and the high levels that occurred in the 1970s, 1980s and early 1990s. This variation in supplies is due to long-term hydroclimatic variability. Paleo-hydrologic investigations have also speculated that the Great Lakes may have been drastically lower thousands of years ago and that recent levels (the last 100 years) may actually have been unusually high.</p> <p><u>Study Methods</u></p> <p>Of the hydrologic factors, over-lake precipitation and evaporation data are most deficient and are usually estimated using differences between measured inflows and outflows. This technique is referred to as the “residual method.” To better define over-lake evaporation, two eddy co-variance devices have been installed on lighthouses: one on Lake Superior and on Lake Huron. These devices will be used to verify estimated values. The Study Board is recommending that these devices be operated and maintained after the Study is completed in 2012.</p>

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<p>The question is: why would such a effect happen in such a short time frame. Several conjectures can be made that might address that question. Perhaps:</p> <ol style="list-style-type: none"> 1) The sun has become hotter. 2) The atmosphere has become thinner. 3) Changes in nature have increased the water temperature. 4) Activity of human has increased the temperature of the water. <p>To dispel the fears projected by this conjecture and to understand the changes that are happening in nature, I suggest that the following questions be answered with accurate information:</p> <ul style="list-style-type: none"> • Has the sun gotten hotter than it used to be sixty years ago? • Has the precipitation rate changed drastically over a 60 year period? • Is the atmospheric pressure lower than it was 60 years ago? • Is the water of the lakes warmer than it was 60 years ago? <p>I am sure that it will not be easy to answer those questions, simply because there are normal variations to each one of the phenomenon.</p> <p>As I understand it, the sun's radiation has been relatively stable for millennia even though there are periodic events of sunspots or lack of them.</p> <p>The snow fall was quite heavy last winter so I suspect that the amount of precipitation varies from year to year. The atmospheric pressure varies daily and is useful in understanding the weather. I like swimming and have noticed that the water temperature changes on a seasonal basis, at least close to the shores.</p> <p>It might be difficult to find a longer term variations that can be smaller than the normal short term variations in each of these activities of nature.</p> <p>Let's suppose for a moment that the average water temperature of a lake increases for some reason. According to the laws of physics when water is heated it expands. If the water of a lake heats up, then the water level will increase unless it is drained at the same rate as the expansion. As eluded to earlier, the drainage must take into consideration the evaporation as well as the outflow. Since the water would be warmer than usual then the evaporation rate will be higher than usual. When water changes from a liquid state to a gaseous state the remaining liquid becomes cooler. Nature does a kind of balancing act, if the water in a open container like a lake is heated, then the evaporation rate increases and the water temperature will again cool down. Such a behavior of the water may make it difficult to measure the long term increase or decrease of lake water temperature. The atmosphere is also a flue and behaves in a similar manner to that of a liquid such as water.</p> <p>Assuming that the water level drop in the lakes is due to increased evaporation, the question then is: What would cause such an effect to manifest itself in the last sixty years? If the effect is not caused by the energy increase from the sun then the effect</p>	

SUBMISSION	STUDY BOARD RESPONSE
<p>must be caused by something that is heating the water locally.</p> <p>Could human activity such as industries and/or nuclear power plants? How energy efficient are the nuclear power plants, in other words, how much energy is lost as heat and radioactive radiation such as alpha, beta and gamma, from each nuclear reactor? Could such leakage increase the temperature of the surrounding environment?</p> <p>There are various websites available that give information about the water usage for thermo electric power generation and/or nuclear power capacity and the water temperatures of the lakes.</p> <p>The information from such websites could be compiled and calculations made to indicate whether the hypothesis is reasonable. But without the actual measurements obtained from the lakes and the atmosphere over a long period of time, the calculations would not represent the actual changes that have occurred.</p> <p>Those are my thoughts and I'm wondering if someone has done any research into the possibilities of industrial or power generating activity causing the observed low water levels.</p>	
<p>13 Dear Drs. Yuzyk and Stakhiv:</p> <p>I am a concerned Georgian Bay cottager who has enjoyed the use of the Great Lakes for over 30 years. I am writing to inform you of some concerns I have with the IUGLS report. The "No Action" recommendation based on the fact that the increased conveyance of the St. Clair River is not manmade does not make sense. Regardless of whether the cause has been the US Army Corps of Engineers dredging or the ice jam of 1984, it is clear that we are facing a crisis. The increased outflow of water from Lake Huron into Lake Michigan has been visibly evident over the past 10 years with water levels increasing only slightly over the last 2 years due to increased precipitation.</p> <p>I am also disturbed by the fact that the IUGLS report seems to dismiss the findings of W. F. Baird and Associates, an internationally respected coastal engineering firm. The April 14, 2009 Baird Report commissioned by the IUGLS indicates that the Baird researchers found flaws in the bathymetry data produced by Environment Canada staff in 2002, and this potentially flawed data was used for all the modeling carried out in the St. Clair River by the IUGLS. As a result, the flows from your study may be significantly underestimated. I encourage the Study Board to acknowledge and consider the inconsistencies raised by the Baird findings.</p> <p>It is my hope that the IUGLS will make a recommendation for action. Now is the time</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Natural and Human-Mediated Changes in the St. Clair River</u></p> <p>At a technical level, the notion of remediation is limited to addressing damages caused by past actions of man, such as dredging. Generally, remediation is not considered when the cause is natural because there would necessarily be additional damages associated with altering natural processes. The Board originally determined that this was another factor, but not a key factor for not recommending remediation. Based on the public response and further clarification from the IJC has lead to this distinction being dropped. The relatively small magnitude of the change, combined with the large uncertainty around the number was the key consideration. The fact that the change was not on-going and in fact based on the later data, which are more reliable, indicates that there has been a small decrease in conveyance factored into the decision. In addition, since variations in climate patterns affecting water supplies, and not changes in conveyance capacity, were found to be the major cause of lower levels, it was beyond the mandate of the Study Board to recommend remediation for a cause other than ongoing physical change in the bed of the river. Extensive investigations by scientists over the last three years have determined that the difference in water levels between Lakes Michigan-Huron and Erie is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies. According to the comprehensive bathymetric surveys undertaken since 2000, there is no evidence of ongoing erosion</p>

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<p>to consider the options available to control, and manage the outflow of water from Lake Huron into Lake Michigan. I know that there are costs and liabilities associated with such an ambitious endeavor, but time is ticking, and soon it may be too late. This is certainly a fitting time in history to move on this, with the recent stimulus money put forward by both the US and Canadian governments. Why not use some of this money for projects such as this?</p> <p>As a cottager, this issue became significant to me when I was just barely able to navigate my boat to my island retreat on Georgian Bay in 2006. I was faced with the very real possibility that one day, I may not be able to reach the island by boat. Are my motives selfish? Perhaps. But I now see that there is a bigger picture, with a limited window of opportunity. A loss of 6 billion gallons of water per day is simply unacceptable.</p>	<p>in the St. Clair River. With the available data, it is not possible to determine when the period of stable morphologic regime began, but it coincides with the relatively low lake levels of the past decade.</p> <p><u>Study Board Response to the Baird Report</u> The IUGLS does not ‘dismiss’ the Baird Report findings. The investigations performed for the IUGLS were based on sound science by nearly one hundred investigators. The methods and data utilized and the resulting findings were examined in an extensive independent peer review process which found all investigations to be appropriate and sufficient to address the questions posed. The purpose of the Study was not to refute the findings of the Baird report nor to question the data and techniques that they used, but to independently undertake a much broader range of analyses than Baird was able to mount, with a considerable wealth of new data and measurements. Baird did not have much of the newer data available for their analyses. Even though both studies used the same models, the data were not consistent. The differences in the modeling approaches have been thoroughly discussed in the final report.</p> <p><u>Study Findings, Recommendations and Next Steps</u> The Study’s findings indicated that the increase in conveyance or water-carrying capacity of the St. Clair River is not ongoing, and based on bathymetry from 2000 to 2007, conveyance capacity has slightly decreased. In addition, the overall increase in conveyance capacity since 1971 is small relative to the degree of scientific uncertainty associated with the various analyses and data measurements. Furthermore, the conveyance capacity change is likely the result of a combination of factors, rather than any single factor.</p> <p>Phase 2 of the Study may consider control structures in the connecting channels as part of its investigations to improve Lake Superior outflow management to address climate change and variability. However, detailed design studies of possible control structures are beyond the scope of the Study. Also, based on expert consultation, such detailed studies and design and construction of control structures would likely take considerable time to complete and would have to consider carefully the impacts on both upstream and downstream interests.</p>
<p>14 We have read with concern your DRAFT ST.CLAIR RIVER REPORT and have great difficulty in understanding why your opinion of the problem differs so greatly from the science that exists in regards to the increased flow of water from the upper lakes through the St. Clair River. We reside in Collingwood and have a cottage on an island in Georgian Bay and need no scientist to tell us that the water levels are significantly lower than in previous years.</p> <p>Enough money has been spent on meetings and studies to pay for much of the remediation that could be done.</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Availability of Peer Reviews and Technical Reports</u> In the fall of 2007, when water levels were quite low, there was much interest from the public and from elected officials in accelerating the St. Clair River portion of the Study and moving up the spring 2010 publication date of the draft report. Therefore, with the approval of the International Joint Commission and the Public Interest Advisory Group, the draft report, <i>Impacts on Upper Great Lakes Water Levels: St. Clair River</i>, was released nearly one year ahead of its original schedule. The decision</p>

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<p>Why have you released your opinion before the studies are complete?</p> <p>One would think that your experts are only selecting reports and data that support your "do nothing" approach.</p> <p>The time has come to overcome the politics of this issue and deal with the reality. Water levels in the upper lakes have dropped considerably and continue to do so. Even if current flow through the St. Clair River is not the total problem, it is obvious to all that it is a significant contributor to the problem and one that can be addressed.</p> <p>For the sake of all of us whose lives are so intimately linked to Georgian Bay and Lakes Huron and Michigan, please reconsider your position and recommend that attention be paid to the Baird Study and others that propose solutions to the problem.</p>	<p>to accelerate the Study was not taken lightly, and there was much discussion and effort involved in maintaining the integrity of the science. To accommodate the revised schedule, the public comment and the peer review periods were scheduled to occur concurrently. The Study Board is confident that this timeline was the most appropriate given the time constraints placed on the process.</p> <p>The International Joint Commission and Study Board recognized the need for the Study to be scientifically credible and transparent given the diverse interests concerned with Great Lakes water levels, the complexity of many of the scientific and engineering studies required, and the uncertainty associated with the outcomes. As a result, the Study review process requires that every level of research conducted under the IUGLS adhere to a high level of scientific rigor. The process includes both internal reviewers from among Study scientists and engineers – involving the Technical Work Groups, the St. Clair River Task Team and the Study Board – and external reviewers who are independent of the Study. In this regard, the IJC contracted with the Environmental and Water Resources Institute (EWRI) of the American Society of Civil Engineers (ASCE) and with the Canadian Water Resources Association (CWRA) to provide independent peer reviewers who are experts in their respective fields. The review process was managed by the IJC at arm’s length from the Study to maintain the integrity of the process.</p> <p>As part of the St. Clair River Study, more than 40 technical research projects were commissioned. Two weeks after the release of the draft report, <i>Impacts on Upper Great Lakes Water Levels: St. Clair River</i>, Volume II of the report was made available. Volume II contained 2-3 page summaries of all of the science reports appended to the draft report. As peer reviews (internal and external, depending on the specific report) were completed, the full reports were also made available on the Study website.</p> <p>The full draft report, three key science chapters and eight specific technical reports were submitted for independent peer review last spring (12 documents, 24 reviews as there is one reviewer from each country reviewing each report). A complication arose when the external independent peer reviews took much longer than anticipated. In fact, the last peer review was not received until the middle of November. However, since the public will have another opportunity to submit questions and comments to the IJC next spring, the Study Board thought that soliciting public comment on the draft report prior to publication of all of the peer reviews was an acceptable course of action. What is important to highlight is that the final report submitted to the IJC reflects the peer reviews and public comments received as well as the results of additional research conducted over the summer.</p> <p><u>Study Findings, Recommendations, and Next Steps</u></p>

	SUBMISSION	STUDY BOARD RESPONSE
		<p>After extensive investigations by scientists over the last three years, the Study Board determined that the difference in water levels between Lakes Michigan-Huron and Erie is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies.</p> <p>The purpose of the Study was neither to refute the findings of the Baird report nor to question the data and techniques that they used. The investigations performed for the IUGLS were based on sound science by nearly one hundred investigators. The methods and data utilized and the determined results went through an extensive independent peer review process which found all investigations to be appropriate and sufficient to address the questions posed. The Study Board has provided a detailed critique of the Baird Report which is available on the Study website.</p> <p>The Study's findings indicated that the increase in conveyance or water carrying capacity of the St. Clair River is not ongoing, and based on bathymetry from 2000 to 2007, conveyance capacity has slightly decreased. In addition, the overall increase in conveyance capacity since 1971 is small relative to the degree of scientific uncertainty associated with the various analyses and data measurements. Furthermore, the conveyance capacity change is likely the result of a combination of factors, rather than any single factor. The ability to adjust flows in the St. Clair River related to the next phase of the Study regarding improved Lake Superior outflow management may consider structural changes, but their impact on downstream water levels – Lakes St. Clair, Erie and Ontario and the St. Lawrence River – will have to be carefully assessed.</p>
15	<p>I thoroughly support this study and will be very interested in its conclusions. We live on Georgian Bay and the water levels for years have been decreasing dramatically.</p>	<p>Phase 1 of the Study determined that the decline in water levels on Lake Michigan-Huron over the past decade is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies. The next phase of the Study will concentrate on identifying alternatives to Plan 1977-A, the present Lake Superior outflow management plan, in order to take into consideration changing interests and the range of hydrologic conditions that will inevitably occur. The Study Board approach is designed to balance the needs of all the users of the Great Lakes in an equitable manner.</p> <p>Given the review process and its broad, multi-disciplinary approach, the Study Board is confident the final report is a sound scientific document that will guide future policy and management decisions. Moreover, the recommendations are the result of careful consideration of scientific information, exhaustive uncertainty analysis and respond specifically to the directive from the IJC.</p>
16	<p>Re: Lakes Huron and Michigan lake levels</p>	<p>The Study Board understands the public desire for simple solutions, but more</p>

SUBMISSION	STUDY BOARD RESPONSE
<p>Dear Dr's Eugene Stakhiv and Ted Yuzyk:</p> <p>As a kid who played draining puddles and with a civil engineering background, I have a few simple observations that Georgian Bay water levels have been close to their lowest and that it should be fairly simple to determine these lakes outflow through the St Clair River.</p> <p>I have lived on the Severn Sound waterfront year round since 1977 and am interested in all aspects of the sound. Last years water levels were scarily low and I have concern these low levels may return sooner rather than later. Even with the many cloudy days preventing vast evaporation plus abundance of rain, lake levels this past month seem to remain constant.</p> <p>To determine these lakes outflow, surely it is as simple as finding a convenient location, preferably near its mouth of the St Clair River, determine its cross-sectional area and determine the flow rates within the cross-section. Changing the profile of the river bottom and sides will have an affect on flow rates as will a funnel effect at the rivers mouth, but surely a fairly accurate river flow can be determined.</p> <p>Canadians and Americans want simple answers based on simple conclusions to determine what, if anything should be done to avoid future disastrous lower lake levels.</p>	<p>importantly, the public has great expectations that the Study Board be as precise as possible and that the various interests served by the Great Lakes be considered fairly. There are no easy or quick answers to address the challenges caused by fluctuating lake levels.</p> <p>The modelling and analytical strategy undertaken by the Study was very complicated because it responded to the concerns expressed throughout the public involvement and independent peer review processes. As a result, the strategy employed by the Study was very thorough and approached answering the questions from many different disciplines. The Study did exactly what you proposed except in much greater detail and with an extensive peer review so that the Study Board could be confident of the results.</p> <p>Based on 15 different analyses conducted by experts from multiple scientific disciplines, the Study determined that a series of changes to the river bed increased the conveyance somewhat, accounting for about 7-14 centimeters of the drop in head (difference in water levels) between Lakes Michigan-Huron and Lake Erie since 1962. Using extensive bathymetric data that was collected in support of this Study, the Study Board also determined that the river bed has been fairly stable since 2000 with actually a small decrease in conveyance capacity, indicating the riverbed is accreting and not eroding.</p> <p>In the Study Board's final report, you will find the elements of your proposal executed in the various modelling initiatives that were conducted to answer the questions that you posed.</p>
<p>17 Submission from: Georgian Bay Association</p> <p>Dear Drs. Yuzyk and Stakhiv,</p> <p>We are writing this letter in response to your request for comments on the draft St. Clair River Report to the International Upper Great Lakes Study (IUGLS).</p> <p>The Georgian Bay Association (GBA) is an umbrella organization for 22 community associations along the eastern and northern coast of Georgian Bay with a combined membership of over 4,200 property owners.</p> <p>We have read the draft St. Clair River Report and background documents with considerable interest as water levels of the middle lakes, and in particular, Georgian Bay, are of paramount importance to our members. The GBA appreciates the significant effort that has been undertaken in preparing the Draft St. Clair River Report.</p> <p>We have also reviewed the comments submitted to you by fellow Great Lake</p>	<p>After extensive studies by nearly one hundred scientists, it has become clear that the recent declining water levels of the Upper Great Lakes were primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies. Such factors have resulted in the Study Board's conclusion that remediation is not warranted.</p> <p>Phase 2 of the Study may consider control structures in the connecting channels as part of its investigations to improve Lake Superior outflow management to address climate change and variability. However, detailed design studies of possible control structures are beyond the scope of the Study. Also, based on expert consultation, such detailed studies and design and construction of control structures would likely take considerable time to complete and would have to consider carefully the impacts on both upstream and downstream interests.</p> <p>Upon conclusion of Study investigations of alternative plans, if structures in the connecting channels are recommended to address long-term climate variability, the Study Board would also recommend an operational entity, such as a Lake Huron</p>

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<p>organizations including Georgian Bay Forever, Great Lakes United, the National Wildlife Federation and the Waterkeeper Alliance. There is considerable consistency in the comments from these organizations albeit some have delved deeper into the scientific debate than others. We will not repeat the detailed comments of these organizations but will rather focus on what we feel to be the key issue - the future of water level management in the middle Great Lakes.</p> <p>We are very concerned with the significant amount of excess flow of water out of the middle lakes through the St. Clair River. We recognize that there are differing scientific opinions on the causes of this increased conveyance. We do not believe that this debate will be easily resolved or that such a resolution is particularly important. What is important is to keep the increased conveyance in mind as future water level management plans are developed.</p> <p>We believe that the IJC's attention should now focus on the challenge of managing water levels in the middle Great Lakes in light of uncertain climatic conditions. Man made climate change could bring higher or lower air temperatures, more or less ice cover, more or less evaporation and higher or lower precipitation levels all of which could combine to cause significant swings in water levels. Previous IJC studies have concluded that there is a healthy range for water levels in the middle Great Lakes. A range that protects the natural ecosystem (ie wetlands) while being acceptable to human users of the lakes. The challenge is to manage the water level cycle to avoid excessive high levels and excessive low levels. We believe that the only way to do this is to establish a Lake Huron Outflow Control Board as suggested by the Waterkeeper Alliance. This would enable the IJC to manage the middle lakes as we do the other Great Lakes and to have an integrated multilake approach to water management.</p> <p>Some sort of control mechanism in the St. Clair River will be necessary to enable the Control Board to manage fluctuations within the acceptable range. In our opinion the next phase of the study should:</p> <ul style="list-style-type: none"> - assess the different types of mitigation measures that could be taken in the St. Clair River; - assess the positives and negatives of each type of measure both locally and for the entire Great Lakes-St. Lawrence River ecosystem; and - recommend an appropriate measure, or measures, that will provide the control mechanism needed. <p>Initiating this assessment at this time will decrease the time it will take to implement a control mechanism after the remaining scientific studies have been completed.</p>	<p>Outflow Control Board to manage outflows. However, the ultimate establishment of such a board is at the discretion of the International Joint Commission.</p>
<p>18 Submission from: Georgian Bay Forever</p> <p>Please click on Link to obtain the Full PDF version of the Submission.</p>	<p>The Study Board offers the following response to your comments:</p> <p>Please click on Link to obtain the Full PDF version of the response.</p>

	SUBMISSION	STUDY BOARD RESPONSE
19	<p>Submission from: Georgian Bay Land Trust</p> <p>Dear Drs. Yuzyk and Stakhiv,</p> <p>We are writing in response to your request to provide comments on the draft St. Clair River Report to the International Upper Great Lakes Study (IUGLS).</p> <p>The Georgian Bay Land Trust (BGLT) is a registered charity that works along the eastern coast of Georgian Bay and the North Channel to directly protect land that has ecological, geological, and historical significance and to promote the appreciation for this globally unique area. As part of our work, we receive donations of land and in exceptional circumstances, purchase land that has these features to ensure that those properties can be protected in their natural state. We work with local community groups and volunteers to ensure that these properties continue to be protected through ongoing stewardship.</p> <p>As part of our efforts, we do a lot of work on wetlands given their significance at a local, regional and global scale. This includes wetlands that we own as part of our properties, and also includes efforts to protect wetlands by working with other non-government organizations and three levels of Canadian government. A distinct feature of our coastal wetlands in Georgian Bay is the large area of undisturbed shoreline and the natural water level fluctuations which many species have adapted to, including species that are endemic to the area and considered provincially rare. Other Great Lakes have seen a major decline in the quantity and quality of their coastal wetlands, making Georgian Bay one of the best opportunities to ensure the viability of these important habitats.</p> <p>As a result, we urge you to consider the importance of ensuring that these natural water level fluctuations be maintained, because without them, these important habitats and the species that call them home, will be lost forever. We thank you for your consideration and hope that together, we can ensure that the natural systems that define this globally unique region are protected.</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Study Mandate</u> The first phase of the International Upper Great Lakes Study was to determine the causes of the declining water levels on the upper Great Lakes. However, the overall mandate of the Study is the investigation of alternative outflow management plans from Lake Superior that considers interests upon which the existing plan, Plan 1977-A, was based such as hydropower and commercial navigation, as well as interests such as recreational boating and the environment that are not enumerated specifically in the Boundary Waters Treaty.</p> <p><u>Study Organization</u> The organizational structure of the Study includes Technical Work Groups (TWGs), and one key TWG is concentrating on ecosystems such as wetlands within select sites around the Great Lakes like Georgian Bay. Site coordinators will assess these sites and determine how they will react to changing water levels. New alternative regulation plan will take into consideration changing interests and the range of hydrologic conditions that will inevitably occur. Throughout the development of revised regulation plans, the boating industry will be specifically considered when alternatives are compared. In response to hydrologic conditions, lake levels will fluctuate seasonally and the alternatives considered will maintain that seasonality, although the magnitude of the fluctuation may change depending upon the overall assessment of various performance indicators.</p>
20	<p>Submission from: Sans Souci Copperhead Association</p> <p>I am writing this letter at the request of the Sans Souci Copperhead Association Board of Directors representing our members in response to your request for comments on the draft St. Clair River Report to International Upper Great Lakes Study (IUGLS). The Sans Souci Copperhead Associations has over 450 members comprised of over one thousand registered voters from across the United States and Canada who call Georgian Bay their home in the summer time.</p> <p>We are a water based community who are significantly affected by water levels.</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Study Findings, Recommendation and Next Steps</u> As you point out, extensive investigations by scientists over the last three years have determined that the difference in water levels between Lakes Michigan-Huron and Erie is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies.</p> <p>The Study's findings indicated that the increase in conveyance or water-carrying capacity of the St. Clair River is not ongoing, and based on bathymetry from 2000 to</p>

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<p>Water levels are consistently the top concern of our members annually as reflected in our 2009 Annual General Meeting presentation see pages 11-14 http://www.scca.info/2009SSCAAGMPres.pdf . Our properties are assessed and taxed at higher levels specifically because of the perceived value of being water front properties.</p> <p>Over the past ten years our water levels have hovered consistently near historic lows and as a result our members have suffered economic impact. Larger boats, cruisers, no longer utilize our community marina because of the low water. Cottagers have had to add additional docks and in some cases dredge to access their cottages. In 2008 our local municipality, The Township of the Archipelago, made it easier for cottagers to dredge to maintain access to their cottages. There are several cottagers who could not access their cottage at all.</p> <p>Your study does identify multiple causes for the decline in water levels, the most likely culprit climate change. It also recognizes that climate change will persist by recommending ongoing monitoring - "the continuing Study that will include a comprehensive assessment of the future effects of climate change on water supplies in the upper Great Lakes basin on Lake Superior regulation." Yet your study concludes "remedial measures not be undertaken at this time."</p> <p>In your hurry to be one year ahead of schedule, you have missed the key point. Regardless of the reason for current and future water level declines, management of water levels is needed. We find your study's recommendations for no "remedial measures" irresponsible given your knowledge that water levels of Lake Michigan, Lake Huron and Georgian Bay will continue to be impacted by climate change.</p>	<p>2007, conveyance capacity has slightly decreased. In addition, the overall increase in conveyance capacity since 1971 is small relative to the degree of scientific uncertainty associated with the various analyses and data measurements. Furthermore, the conveyance capacity change is likely the result of a combination of factors, rather than any single factor.</p> <p>The next phase of the Study will concentrate on identifying alternatives to Plan 1977-A, the present Lake Superior outflow management plan, in order to take into consideration changing interests and the range of hydrologic conditions that will inevitably occur. Due to the uncertainty associated with long-term climate change, Study scientists are identifying "coping zones" for each interest associated with various water level ranges. Also, as part of the consideration of the extreme hydrologic conditions creating these ranges, control structures in Great Lake connecting channels may be considered. However, it is beyond the scope of the Study to perform detailed design and environmental assessments of these structures.</p> <p><u>Lake Level Fluctuations</u></p> <p>The low water period the upper Great Lakes experienced during the last decade is very similar to one that occurred in the 1930s. As witnessed in the past year, however, conditions can change rapidly. The recent recovery to levels closer to average is the result of higher precipitation in parts of the region that had been dry for several years.</p>
<p>21 I am an ordinary citizen of Canada with a real interest in Georgian Bay. I have lived summer periods for over 50 years on Georgian Bay and I am a Professional Engineer.</p> <p>I have followed with intense interest the activities of the IUGLS. I attended the public meeting at Sault Ste Marie, Ontario.</p> <p>The structure of an international study group with over 100 scientists appears at first to be so impressive.</p> <p>However, please help me to understand why I have disturbing feelings because:</p> <ol style="list-style-type: none"> 1. Conclusions were made without full peer review. 2. Conclusions do not appear to be science based. 3. Conclusions appear to be steering towards climate change and not man made changes. 4. There appears to be a built in resentment towards Canadian initiative of scientific analysis. 5. There appears to be a decided dictatorial style and not true international discussion and working together 	<p>The Study Board offers the following response to your comments:</p> <p><u>Availability of Peer Reviews</u></p> <p>In the fall of 2007, when water levels were quite low, there was much interest from the public and from elected officials in accelerating the St. Clair River portion of the Study and moving up the spring 2010 publication date of the draft report. Therefore, with the approval of the International Joint Commission and the Public Interest Advisory Group, the draft report, <i>Impacts on Upper Great Lakes Water Levels: St. Clair River</i>, was released nearly one year ahead of its original schedule. The decision to accelerate the Study was not taken lightly, and there was much discussion and effort involved in maintaining the integrity of the science. Finally, to accommodate the revised schedule, the public comment and the peer review periods were scheduled to occur concurrently.</p> <p>The International Joint Commission and Study Board recognized the need for the Study to be scientifically credible and transparent given the diverse interests</p>

SUBMISSION	STUDY BOARD RESPONSE
<p data-bbox="142 149 1018 207">6. There appear to be conclusions intimidated by some groups threatening legal action.</p> <p data-bbox="142 214 1058 272">I truly want to have confidence in the study results, but at this time I do not have this confidence.</p>	<p data-bbox="1075 149 2003 532">concerned with Great Lakes water levels, the complexity of many of the scientific and engineering studies required, and the uncertainty associated with the outcomes. As a result, the Study review process requires that every level of research conducted under the IUGLS adhere to a high level of scientific rigor. The process includes both internal reviewers from among Study scientists and engineers – involving the Technical Work Groups, the St. Clair River Task Team and the Study Board – and external reviewers who are independent of the Study. In this regard, the IJC contracted with the Environmental and Water Resources Institute (EWRI) of the American Society of Civil Engineers (ASCE) and with the Canadian Water Resources Association (CWRA) to provide independent peer reviewers who are experts in their respective fields. The review process was managed by the IJC at arm’s length from the Study to maintain the integrity of the process.</p> <p data-bbox="1075 565 2003 980">The Study Board is confident that this timeline was the most appropriate given the time constraints placed on the process. The full draft report, three key science chapters and eight specific technical reports were submitted for independent peer review last spring (12 documents, 24 reviews as there is one reviewer from each country reviewing each report). A complication arose when the external independent peer reviews took much longer than anticipated. In fact, the last peer review was not received until the middle of November. However, since the public will have another opportunity to submit questions and comments to the IJC next spring, the Study Board thought that soliciting public comment on the draft report prior to publication of all of the peer reviews was an acceptable course of action. What is important to highlight is that the final report submitted to the IJC reflects the peer reviews and public comments received as well as the results of additional research conducted over the summer.</p> <p data-bbox="1075 1013 1730 1045"><u>Natural and Human Mediated Changes in the St. Clair River</u></p> <p data-bbox="1075 1052 2003 1494">At a technical level, the notion of remediation is limited to addressing damages caused by past actions of man, such as dredging. Generally, remediation is not considered when the cause is natural because there would necessarily be additional damages associated with altering natural processes. The Board originally determined that this was another factor, but not a key factor for not recommending remediation. Based on the public response and further clarification from the IJC has lead to this distinction being dropped. The relatively small magnitude of the change, combined with the large uncertainty around the number was the key consideration. The fact that the change was not on-going and in fact based on the later data, which are more reliable, indicates that there has been a small decrease in conveyance factored into the decision. In addition, since variations in climate patterns affecting water supplies, and not changes in conveyance capacity, were found to be the major cause of lower levels, it was beyond the mandate of the Study Board to recommend remediation for a cause other than ongoing physical change in the bed of the river.</p>

SUBMISSION	STUDY BOARD RESPONSE
	<p><u>Study Findings and Recommendations</u></p> <p>As you mention, extensive investigations over the last three years have been conducted by nearly 100 scientists from around the Great Lakes using sound science to determine possible changes in the St. Clair River were affecting water levels in the upper Great Lakes. The results and techniques used went through an extensive peer review as noted above. These investigations have determined that the difference in water levels between Lakes Michigan-Huron and Erie is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies. In many cases, numerous investigations were conducted to achieve redundancy in the conclusions that were drawn, each arriving at similar conclusions. For example, based on 15 different analyses conducted by experts from multiple scientific disciplines, the Study determined that a series of changes to the river bed increased the conveyance somewhat, accounting for about 7-14 centimeters of the drop in head (difference in water levels) between Lakes Michigan-Huron and Lake Erie since 1962. In addition, using extensive bathymetric data that was collected in support of this Study, the Study Board also determined that the river bed has been fairly stable since 2000 with actually a small decrease in conveyance capacity, indicating the riverbed is accreting and not eroding.</p> <p><u>Study Organization</u></p> <p>The Study Board has strived to maintain an open and transparent dialogue regarding Study investigations and the resulting conclusions were not pre-determined. Also, the Study Board consists of equal representation of U.S. and Canadian scientists and there is no resentment of either country's scientific analyses. Likewise, the Study benefitted greatly from the advice of a binational Public Interest Advisory Group that included a broad range of representatives including several from Georgian Bay. The conduct of the Study is administered by the International Joint Commission, an organization that has overseen boundary water issues for more than one hundred years.</p>
Basin-Wide	
<p>22 Submission from: Alliance for the Great Lakes – National Wildlife Federation — Freshwater Future – Midwest Environmental Advocates – Wisconsin Wildlife Federation – Milwaukee Riverkeeper – Sierra Club Great Waters Group - Sixteenth Street Community Health Center</p> <p>Dear Drs. Stakhiv and Yuzyk:</p> <p>On behalf of the Alliance for the Great Lakes, National Wildlife Federation, Freshwater Future, Midwest Environmental Advocates, Wisconsin Wildlife Federation, Milwaukee Riverkeeper, Sierra Club Great Waters Group, and the Sixteenth Street Community Health Center we would like to thank you for the opportunity to comment on Phase I of the International Upper Great Lakes Study. We</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Availability of Peer Reviews and Technical Reports</u></p> <p>In the fall of 2007, when water levels were quite low, there was much interest from the public and from elected officials in accelerating the St. Clair River portion of the Study and moving up the spring 2010 publication date of the draft report. Therefore, with the approval of the International Joint Commission and the Public Interest Advisory Group, the draft report, <i>Impacts on Upper Great Lakes Water Levels: St. Clair River</i>, was released nearly one year ahead of its original schedule. The decision to accelerate the Study was not taken lightly, and there was much discussion and effort involved in maintaining the integrity of the science. To accommodate the revised schedule, the public comment and the peer review periods were scheduled</p>

SUBMISSION	STUDY BOARD RESPONSE
<p>urge the Study Board to release all scientific reports so that we can properly comment. At this time we view the process as incomplete and cannot make an informed decision as to whether or not we support the Study Board's recommendation to take no remedial action. It is a disservice to not provide thorough and publicly accessible reports for those who work with a common goal to protect the Great Lakes.</p> <p>We acknowledge that the science is complex and that the Study Board summarized a number of scientific reports in order to reach a salient conclusion. What we do not understand is why the Study Board has yet to release the completed existing studies. There are a number of reports as of July 17, 2009 that are not yet released on the IUGLS website, or are released as incomplete. The reason stated for the incomplete release is peer review and the reports are labeled as subject to change. Even if the reports were to be released tomorrow, the time allotted for review and analysis would not be sufficient to meet an August 1 deadline.</p> <p>Additionally, a number of us have attended the public meetings. At a recent public meeting, the Study Board announced that they had been underestimating outflow numbers since 1986. There seems to be some question about whether net basin supply numbers used in the study have been corrected. We strongly urge the Study Board to demonstrate that the numbers have been corrected and that any resulting impacts on study results be made.</p> <p>We ask for a fair chance to read and review the complete and total scientific reports, corrected as necessary, with sufficient time to comment, before the Board makes a recommendation to the International Joint Commission. Thank you.</p>	<p>to occur concurrently. The Study Board is confident that this timeline was the most appropriate given the time constraints placed on the process.</p> <p>The International Joint Commission and Study Board recognized the need for the Study to be scientifically credible and transparent given the diverse interests concerned with Great Lakes water levels, the complexity of many of the scientific and engineering studies required, and the uncertainty associated with the outcomes. As a result, the Study review process requires that every level of research conducted under the IUGLS adhere to a high level of scientific rigor. The process includes both internal reviewers from among Study scientists and engineers – involving the Technical Work Groups, the St. Clair River Task Team and the Study Board – and external reviewers who are independent of the Study. In this regard, the IJC contracted with the Environmental and Water Resources Institute (EWRI) of the American Society of Civil Engineers (ASCE) and with the Canadian Water Resources Association (CWRA) to provide independent peer reviewers who are experts in their respective fields. The review process was managed by the IJC at arm's length from the Study to maintain the integrity of the process.</p> <p>As part of the St. Clair River Study, more than 40 technical research projects were commissioned. Two weeks after the release of the draft report, <i>Impacts on Upper Great Lakes Water Levels: St. Clair River</i>, Volume II of the report was made available. Volume II contained 2-3 page summaries of all of the science reports appended to the draft report. As peer reviews (internal and external, depending on the specific report) were completed, the full reports were also made available on the Study website. All scientific reports are complete and available for review.</p> <p>The full draft report, three key science chapters and eight specific technical reports were submitted for independent peer review last spring (12 documents, 24 reviews as there is one reviewer from each country reviewing each report). A complication arose when the external independent peer reviews took much longer than anticipated. However, since the public will have another opportunity to submit questions and comments to the IJC next spring, the Study Board thought that soliciting public comment on the draft report prior to publication of all of the peer reviews was an acceptable course of action. What is important to highlight is that the final report submitted to the IJC reflects the peer reviews and public comments received as well as the results of additional research conducted over the summer.</p> <p><u>Study Findings and Recommendations</u></p> <p>The questions you note regarding outflow and net basin supply values have been resolved and the Study Board's conclusions remain unchanged that the causes of the recent declining water levels on the upper Great Lakes are largely the result of hydrologic variability and glacial isostatic adjustment. As such, the Study Board</p>

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	recommends that no remedial structures in the St. Clair River are warranted.
<p>23 Submission from: Great Lakes Boating Federation</p> <p>Of the 25 million people who use the Great Lakes, it is estimated that more than 5 million are recreational boaters. A recent study report compiled by the Army Corps of Engineers concludes that 911,000 boaters visit the Great Lakes annually and that they support 60,000 jobs and have an estimated annual economic impact of \$9.4 billion. A Great Lakes Commission study on recreational boating has provided higher values to the number of boaters, jobs and economic impact. Though on the same subject, the studies yield conflicting results.</p> <p>Recreational boating is big business, but this enormous value has never been fully realized and recognized by the IJC and others. Consequently, boat owners have never been allowed to participate in decisions pertaining to lake levels. When the IJC assembled individuals to participate in its critical Five-Year International Upper Great Lakes Study, PIAG, boat owners were left out.</p> <p>Recreational boating and tourism are on the rise and other boating interests, such as commercial navigation, are on the decline. It is estimated that the economic impact of commercial navigation is placed at \$3.6 million in comparison and is declining.</p> <p>As America is shifting from manufacturing to service industries, recreational boating is becoming a godsend to coastal municipalities to fill the gap left by declining commercial navigation interests. The IJC needs to amend its ways to include the heretofore “neglected stepchildren” of recreational boating.</p> <p>Water levels on the upper Great Lakes are now only about eight inches below the long-term average, and they should continue to rise three to four inches. This is welcome news to boaters who have felt the effects of low water levels for years. Many marinas on the Great Lakes, both small and large, remain with fixed docking systems, and lake levels have a considerable impact on their functional uses. While the Great Lakes can offer exquisite boating opportunities, small harbor maintenance issues are a persistent problem due to the way the federal government has prioritized projects. The U.S. Army Corps of Engineers is provided with federal funding to only maintain commercial harbors. This leaves recreational harbors rarely maintained or improved. The IJC must get involved with this matter to shift attention to recreational boating harbors.</p> <p>The combined effect of over-dredging on the St. Clair River and climate changes that may have contributed to rising level of Lake Erie need to be quantified and understood by the boating community so intelligent decisions can be made by boat owners for the future. The long-term effect of the St. Clair River outflow, believed to</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Study Mandate</u> The first phase of the International Upper Great Lakes Study was to determine whether potential ongoing changes in the St. Clair River might be the cause of declining water levels on the upper Great Lakes. However, the overall mandate of the Study is the investigation of alternative outflow management plans from Lake Superior considering interests upon which the existing plan, Plan 1977-A, was based such as hydropower and commercial navigation, and also interests not specifically enumerated in the Boundary Waters Treaty, such as recreational boating and the environment.</p> <p><u>Study Organization</u> The organizational structure of the Study includes technical work groups, one of which is concentrating on the recreational boating, cruise ship and tourism industries. Surveys of marinas at select sites in Canada and the United States have already taken place and work is ongoing which will help with the determination of performance indicators that will be used to test alternative regulation plans. The Study’s Plan Formulation and Evaluation group has been conducting “circles of influence” meetings in areas with high concentrations of boaters inviting participation by representatives of marinas and other related activities. Throughout the development of revised regulation plans, the boating industry will be specifically considered when alternatives are compared. We certainly welcome your participation in the process as the Lake Superior phase of the Study moves forward.</p>

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<p>be a result from over-dredging, has never been fully understood by recreational boaters.</p> <p>IJC must encourage and allow boat owners to participate in any decision-making that directly affects their destiny. The IJC must get more involved with boating. It should seek federal funds on the order of \$1 million to attain two accurate studies to determine the value of both recreational boating and commercial navigation on the Great Lakes.</p> <p>As we continue to see a decline in manufacturing in the Great Lakes region, coastal municipalities will need to fill this gap. Depending on the results of these studies, the gap could be filled by embracing recreational boating and promoting waterfront redevelopment for tourism and recreation.</p>	
<p>24 Submission from: Waterkeeper Alliance</p> <p>Dear Drs. Yuzyk and Stakhiv,</p> <p>The Waterkeepers for the Great Lakes are all working in their part of the lakes and connecting rivers on issues related to Great Lakes water quality and quantity. We are all aware of the close link between water quality and quantity and we know that climate change will likely lower water levels particularly on Lakes Michigan, Huron and Erie. That will only exacerbate some serious water quality conditions, including excess algal growth, as nutrients and contaminants become concentrated.</p> <p>It is, then, with a great deal of interest that we have reviewed the International Upper Great Lakes Study's May 1, 2009 release for public comment of the St. Clair River Draft Report. We are frankly very disappointed by the conclusions of this Study and the lack of transparency of the scientific reports that it is based on. The research reports for the Study have only recently been posted for public scrutiny. At public meetings you have reported that the St Clair River flows have been underestimated since 1986 and that net basin supply numbers are as a result still undergoing revisions. It is, then, clearly premature for the Study to be reaching a do nothing conclusion in light of the very significant 5% increased St Clair River conveyance that you have found.</p> <p>While we note that most of the Reports for the work undertaken by the Study have now been posted, we are concerned that many have notes attached indicating that they have undergone peer review and are being revised. If these revisions are significant then the conclusions may have to change. Given these revisions, your conclusion is premature. The public should have been entitled ample time to review the scientific reports.</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Availability of Peer Reviews and Technical Reports</u></p> <p>In the fall of 2007, when water levels were quite low, there was much interest from the public and from elected officials in accelerating the St. Clair River portion of the Study and moving up the spring 2010 publication date of the draft report. Therefore, with the approval of the International Joint Commission and the Public Interest Advisory Group, the draft report, <i>Impacts on Upper Great Lakes Water Levels: St. Clair River</i>, was released nearly one year ahead of its original schedule. The decision to accelerate the Study was not taken lightly, and there was much discussion and effort involved in maintaining the integrity of the science. To accommodate the revised schedule, the public comment and the peer review periods were scheduled to occur concurrently. The Study Board is confident that this timeline was the most appropriate given the time constraints placed on the process.</p> <p>The International Joint Commission and Study Board recognized the need for the Study to be scientifically credible and transparent given the diverse interests concerned with Great Lakes water levels, the complexity of many of the scientific and engineering studies required, and the uncertainty associated with the outcomes. As a result, the Study review process requires that every level of research conducted under the IUGLS adhere to a high level of scientific rigor. The process includes both internal reviewers from among Study scientists and engineers – involving the Technical Work Groups, the St. Clair River Task Team and the Study Board – and external reviewers who are independent of the Study. In this regard, the IJC contracted with the Environmental and Water Resources Institute (EWRI) of the American Society of Civil Engineers (ASCE) and with the Canadian Water Resources Association (CWRA) to provide independent peer reviewers who are experts in their respective fields. The review process was managed by the IJC at arm's length from</p>

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<p>Further, we disagree with your recommendation that no remediation is needed in the St. Clair River. To state that the 1984 ice jam was the sole cause of a 5% increase in conveyance or a loss of 6 billion gallons per day of water from Lakes Michigan and Huron appears to be based on conjecture, for no research was conducted at the time. To claim that the ice jam was natural ignores that fact that an icebreaker clearing a shipping channel caused it. Had no maintenance dredging taken place since 1962, we might have found the ice jam explanation partly believable, but such is not the reality. The maintenance dredging that has regularly taken place has had significant cumulative effects on the hydrology of the system, for thousands of cubic yards of material have been removed each time. Investigating the impact of that maintenance dredging this summer for the first time clearly indicates that the Draft Report is premature and based on inadequate data.</p> <p>In addition, the Study's mandate does not make a distinction between human-induced versus natural causes of the increased conveyance. It reads: "examine physical processes and possible ongoing St. Clair River changes and its impacts on levels of Lake Michigan and Huron. Additionally, depending on the nature and extent of St. Clair River changes and impacts, recommend and evaluate potential remedial options." The Study Board's explanation, then, that no action is recommended in the St. Clair River has no basis either by mandate limitation or in the research findings. The causes of the increased conveyance are all much more likely a combinations of factors the vast majority of which are not natural i.e. sand and gravel mining of the riverbed, removal of sand supply by placement of groynes at the south end of Lake Huron, extensive hardening of shorelines, dredging including maintenance dredging and the use of ice breakers to maintain navigation.</p> <p>The 5% increase in conveyance or loss of 6 billion gallons of water a day from Lakes Michigan and Huron is a very significant increase in the outflow, and at 3 times the Chicago diversion, a diversion that more than justifies remediation. While there has been some loss of interest in water levels as lake levels have rebounded over the last year, Lakes Michigan and Huron remain below their long-term average in spite of well above average precipitation and good ice cover. The time to act is now when Lakes Erie and Ontario are above their long-term average. Once climate change kicks in, it will be very difficult to hold back water, but if at least the 9 inches lost due to this increased conveyance are gradually returned, then all the lakes will be in better position to contend with the impact of future climate change. To not recommend remediation now would be an egregious error by the Study Board. Generations to come will look back with regret and reproach on such a costly lack of appropriate action to protect the ecological integrity of all the Great Lakes.</p>	<p>the Study to maintain the integrity of the process.</p> <p>As part of the St. Clair River Study, more than 40 technical research projects were commissioned. Two weeks after the release of the draft report, <i>Impacts on Upper Great Lakes Water Levels: St. Clair River</i>, Volume II of the report was made available. Volume II contained 2-3 page summaries of all of the science reports appended to the draft report. As peer reviews (internal and external, depending on the specific report) were completed, the full reports were also made available on the Study website. All scientific reports are complete and available for review.</p> <p>The full draft report, three key science chapters and eight specific technical reports were submitted for independent peer review last spring (12 documents, 24 reviews as there is one reviewer from each country reviewing each report). A complication arose when the external independent peer reviews took much longer than anticipated. However, since the public will have another opportunity to submit questions and comments to the IJC next spring, the Study Board thought that soliciting public comment on the draft report prior to publication of all of the peer reviews was an acceptable course of action. What is important to highlight is that the final report submitted to the IJC reflects the peer reviews and public comments received as well as the results of additional research conducted over the summer.</p> <p><u>Study Findings, Recommendations and Next Steps</u></p> <p>The questions you note regarding outflow and net basin supply values have been resolved and the Study Board's conclusions remain unchanged that the causes of the recent declining water levels on the upper Great Lakes are largely the result of hydrologic variability and glacial isostatic adjustment. As such, the Study Board recommends that no remedial structures in the St. Clair River are warranted. The next phase of the Study may consider control structures in the connecting channels as part of its investigations to improve Lake Superior outflow management to address climate change and variability. However, detailed design studies of possible control structures are beyond the scope of the Study. Also, based on expert consultation, such detailed studies and design and construction of control structures would likely take considerable time to complete and would have to consider carefully the impacts on both upstream and downstream interests.</p> <p>Upon conclusion of Study investigations of alternative plans, if structures in the connecting channels are recommended to address long-term climate variability, the Study Board would also recommend an operational entity, such as a Lake Huron Outflow Control Board to manage outflows. However, the ultimate establishment of such a board is at the discretion of the International Joint Commission.</p>

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<p>We, the undersigned Great Lakes Waterkeepers, request that the Study Board's conclusions and principal recommendation be withdrawn and that all of the work carried out for the Study (and previous studies), when revised, be incorporated into a revised report that consists of the most accurate and timely data available. In the meantime, since the Study has confirmed an increase in conveyance of the St. Clair River, we request that the Study Board immediately begin the process of determining the most acceptable and environmentally responsible method of remediation to limit this loss of water from the Lakes. We want full environmental assessment including consideration of Lake Erie's needs.</p> <p>Finally we urge you to recommend to the IJC Commissioners that a Lake Huron Outflow Control Board be established and that all the Control Boards then collaborate so that enhanced coordination of all Great Lakes' resources and better monitoring can begin. Besides dealing with the threat of invasive species, diversion of fresh surface water to the oceans in a time of impending climate change is likely the second most important issue facing the Great Lakes. We need to develop environmentally and economically sustainable methods to protect and preserve this mainly finite resource we have in the Great Lakes that constitutes 20% of the world's fresh surface water and that is only 1% renewable.</p> <p>Thank you for consideration of these comments.</p>	<p><u>Assessing Conveyance Changes in the St. Clair River</u> The average annual discharge of the river is about 5,150 m³ (181,900 ft³) a second or 118 billion gallons per day. The maximum conveyance capacity may have increased by as much as 290 m³ (10,200 ft³) a second which is about 5 percent or within the limits of error. However, lake levels adjust relatively quickly to a new equilibrium, with discharges roughly similar to the past. As a result, the notion of an additional 6 billion gallons per day flowing down the St. Clair River is an extreme overestimate, and the actual increase in flows is a small fraction of that amount. In addition, over the last decade, conveyance capacity has actually decreased slightly, meaning that less water, not more, is being discharged.</p> <p><u>Assessing the Impacts of Ice Jams</u> Ice jams can affect the conveyance of water in a river since hanging ice dams, which form under the ice, can temporarily reduce the flow cross-section and potentially increase flow velocities in the vicinity of the jam. Initial investigations raised the possibility that the 1984 ice jam resulted in an increase in river velocities under the ice potentially scouring the channel bottom. Additional studies done recently, however, have indicated that the channel capacity was likely not altered significantly by the ice jam and that such events alone have no long-term impact on water levels. The Study Board is confident in the finding that the conveyance of the St. Clair River changed sometime in the mid-1980s as this conclusion is based on several different lines of evidence and statistical analyses. There were a number of important and unusual events affecting water levels in that period of a few years, including the record ice jam of 1984, followed by the record high water levels of 1986 and culminating in a severe basin-wide drought in the upper Great Lakes in 1988.</p>
<p>25 Submission from: Great Lakes United</p> <p>Please click on Link to obtain the Full PDF version of the submission.</p>	<p>The Study Board offers the following response to your comments:</p> <p>Please click on the Link to obtain the Full PDF version of the response.</p>
<p>26 Submission from: National Wildlife Federation</p> <p>Please click on Link to obtain the Full PDF version of the submission.</p>	<p>The Study Board offers the following response to your comments:</p> <p>Please click on the Link to obtain the Full PDF version of the response.</p>
<p>Location Not Available</p>	
<p>27 The answer is SIMPLE! Why didnt you put the connection between Chicago changing its river direction to the lowering of the lake level???</p> <p>That is the answer!</p>	<p>Unfortunately, the solution to the fluctuating lakes levels is not as simple as you propose. There are no easy or quick answers to address the challenges caused by fluctuating lake levels. For example, the century-old Chicago Diversion is not the reason for the low water levels experienced recently or in the past. On average, this diversion allows 3,200 cubic feet per second (90 cubic metres per second) of water to flow from Lake Michigan to the Mississippi River Basin. This amount was decreed by the United States Supreme Court and its impacts on lake levels are well known.</p>

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	<p>Although the Chicago Diversion removes water from the Great Lakes, 5,000 cubic feet per second (142 cubic meters per second) is diverted from the Hudson River Basin into the Great Lakes by the Long Lac and Ogoki Diversions into Lake Superior. As a result, the net impact is negligible.</p>
<p>28 I am very concerned with the tunnel project under Niagara falls, it is 1.5 times larger than the Eurotunnel, where will the water come from for this project and was an environmental impact assessment done, what were the results?</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Study Findings and Recommendations</u></p> <p>After extensive investigations by scientists over the last three years, the Study Board determined that the difference in water levels between Lakes Michigan-Huron and Erie is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies. As a result, remedial structures in the St. Clair were not justified considering that erosion was not ongoing, the river bed appears to be stable and the change in conveyance capacity is within the margin of measurement error.</p> <p><u>Study Board Response to the Baird Report</u></p> <p>The purpose of the Study was not to refute the findings of the Baird report nor to question the data and techniques that they used, but to independently undertake a much broader range of analyses than Baird was able to mount, with a considerable wealth of new data and measurements. The investigations performed for the IUGLS were based on sound science by nearly one hundred investigators. The methods and data utilized and the resulting findings were examined in an extensive independent peer review process which found all investigations to be appropriate and sufficient to address the questions posed. Baird did not have much of the newer data available for their analyses. Even though both studies used the same models, the data were not consistent. The differences in the modeling approaches have been thoroughly discussed in the final report.</p>
<p>29 I am disheartened by the conclusion that no remediation is required. It reminds me of the response to acid rain with endless calls for further study and no action. Please reconsider the findings of the Baird report.</p>	<p>The Study Board offers the following response to your comments:</p> <p><u>Study Findings and Recommendations</u></p> <p>After extensive investigations by scientists over the last three years, the Study Board determined that the difference in water levels between Lakes Michigan-Huron and Erie is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies. As a result, remedial structures in the St. Clair were not justified considering that erosion was not ongoing, the river bed appears to be stable and the change in conveyance capacity is within the margin of measurement error.</p> <p><u>Study Board Response to the Baird Report</u></p> <p>The purpose of the Study was not to refute the findings of the Baird report nor to question the data and techniques that they used, but to independently undertake a much broader range of analyses than Baird was able to mount, with a considerable</p>

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30	<p>The IJC is vitally important in implementing the appropriate measures that will stop the unnecessary loss of water from Lake Huron. This water loss has negatively impacted our area with regards to navigation, access to our docks and loss to local boating related businesses in our communities.</p>	<p>After extensive investigations by scientists over the last three years, the Study Board determined that the difference in water levels between Lakes Michigan-Huron and Erie is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies. The Study's findings indicated that the increase in conveyance or water-carrying capacity of the St. Clair River is not ongoing, and based on bathymetry from 2000 to 2007, conveyance capacity has slightly decreased. In addition, the overall increase in conveyance capacity since 1971 is small relative to the degree of scientific uncertainty associated with the various analyses and data measurements. Furthermore, the conveyance capacity change is likely the result of a combination of factors, rather than any single factor. Similar periods of low water levels occurred in the 1930s and 1960s and may occur again. Moreover, periods of high water levels might also occur again, just as they did in the 1970s and 1980s when record highs were reached despite 150 years of changes to the connecting channels.</p> <p>You are encouraged to stay informed of prevailing hydrologic conditions on the lakes through the Environment Canada (http://www.on.ec.gc.ca/water/levels/) and USACE Corps of Engineers-Detroit District (http://www.lre.usace.army.mil/greatlakes/hh/greatlakeswaterlevels) websites, so that you may act appropriately to protect your property and livelihood.</p>
31	<p>I am unhappy with the do nothing recommendation from the study. We want a Remediation Plan regardless of the cause. We want a clear threshold established when the Plan would be activated.</p>	<p>After extensive investigations by scientists over the last three years, the Study Board determined that the difference in water levels between Lakes Michigan-Huron and Erie is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies. The investigations performed for the IUGLS were based on sound science by nearly one hundred investigators. The methods and data utilized and the resulting findings were examined in an extensive independent peer review process which found all investigations to be appropriate and sufficient to address the questions posed.</p> <p>The Study's findings indicated that the increase in conveyance or water-carrying capacity of the St. Clair River is not ongoing, and based on bathymetry from 2000 to 2007, conveyance capacity has slightly decreased. In addition, the overall increase in conveyance capacity since 1971 is small relative to the degree of scientific uncertainty associated with the various analyses and data measurements. Furthermore, the</p>

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32	<p>water levels on lakes michigan and huron. we can be sure that the corp of engr is the reason the st clair river is removing excess water from ou lakes. the earlier lake huron lakeside owners study is being covered up by the most recent 3.6 million study. saying nothing can or should be done is not true. Answer is to fill in the river and do it quickly with large rocks and or cement. Doing nothing and losing more water is senseless.</p>	<p>After extensive investigations by scientists over the last three years, the Study Board determined that the difference in water levels between Lakes Michigan-Huron and Erie is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies. The investigations performed for the IUGLS were based on sound science by nearly one hundred investigators. The methods and data utilized and the resulting findings were examined in an extensive independent peer review process which found all investigations to be appropriate and sufficient to address the questions posed.</p> <p>The Study's findings indicated that the increase in conveyance or water-carrying capacity of the St. Clair River is not ongoing, and that, based on bathymetry from 2000 to 2007, conveyance capacity has slightly decreased. In addition, the overall increase in conveyance capacity since 1971 t is small relative to the degree of scientific uncertainty associated with the various analyses and data measurements. Furthermore, the conveyance capacity change is likely the result of a combination of factors, rather than any single factor.</p> <p>There are no quick solutions to raising upper Great Lakes levels since both upstream and downstream impacts of any remedial measure would have to be determined. At the same time, environmental impacts in the vicinity of the structure would have to be assessed. Proper design and construction of such measures could take considerable time and will have to take into account the potential for prevailing periods of high water. Investigation of the ability to adjust flows in the St. Clair River related to the next phase of the Study regarding improved Lake Superior outflow management may consider structural changes, but their impact on downstream water levels – Lakes St. Clair, Erie and Ontario and the St. Lawrence River – will have to be carefully assessed.</p>
33	<p>It is difficult for me to understand how the study could conclude that no action is required to help mitigate the dropping water levels in the upper Great Lakes. As I understand it, the depth of the St. Clair River, due to dredging, is well below the requirements for Seaway shipping. I think the suggestion that underwater check dams be constructed to reduce the outflow of the St. Clair River is a good one. If nor this, then some action is necessary to reduce the outflow. The time for study is past, we need action.</p>	<p>After extensive investigations by scientists over the last three years, the Study Board determined that the difference in water levels between Lakes Michigan-Huron and Erie is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies. Although changes in the riverbed have occurred over the Study timeframe, 1962 to the present, conveyance changes were not the major factor responsible for lower upper Great Lakes levels.</p> <p>The Study's findings indicated that the increase in conveyance or water-carrying capacity of the St. Clair River is not ongoing, and based on bathymetry from 2000 to 2007, conveyance capacity has slightly decreased. In addition, the overall increase in conveyance capacity since 1971 is small relative to the degree of scientific</p>

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34	<p>Perserve the water in the great lakes rather than steal it. record level lows are due to man not nature...stop</p>	<p>After extensive investigations by scientists over the last three years, the Study Board determined that the difference in water levels between Lakes Michigan-Huron and Erie is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies. Although there are diversions into and out of the Great Lakes, they have been in place for decades and have little impact on water levels.</p> <p>The Great Lakes go through natural cycles due to various hydroclimatic factors. Similar periods of low water levels occurred in the 1930s and 1960s and may occur again. Moreover, periods of high water levels might also occur again, just as they did in the 1970s and 1980s when record highs were reached despite 150 years of changes to the connecting channels.</p> <p>You are encouraged to stay informed of prevailing hydrologic conditions on the lakes through the Environment Canada (http://www.on.ec.gr.ca/water/levels/) and USACE Corps of Engineers-Detroit District (http://www.lre.usace.army.mil/greatlakes/hh/greatlakeswaterlevels) web sites, so that you may act appropriately to protect your property and livelihood.</p>
35	<p>Please consider a public comment session in Door County Wisconsin - Lake Michigan is the life blood of this resort county.</p>	<p>Hopefully, you were able to attend one of the two meetings that were scheduled in Wisconsin; the Study Board held public meetings in Fish Creek on July 7, 2009 and Mequon on July 8, 2009. These meetings were scheduled in response to similar requests from concerned members of the public such as yourself. The Mequon meeting was linked via videoconferencing technology to a similar meeting in Ontario, so you can download a recording of the meeting at the IUGLS website. Thank you for your attention to this important issue and for providing critical feedback on the public consultation process.</p>
36	<p>After reviewing all your on line double talk, I remain unconvinced that the St. Clair, whether from an ice jam, or on going erosion is not the problem and those in authority are unwilling to admit to their mistakes. No amount of PR can restore the</p>	<p>After extensive investigations by scientists over the last three years, the Study Board determined that the difference in water levels between Lakes Michigan-Huron and Erie is primarily due not to physical changes in the river but to other factors such as</p>

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<p>water already lost, aggressive action on the St. Clair can help to retain the Western world's greatest fresh water reservoir. Shame on all of you lending your name to such a bogus report.</p>	<p>variations in climate patterns affecting water supplies. The investigations performed for our Study were based on sound science conducted by nearly one hundred investigators. The methods and data utilized and the determined results went through an extensive independent peer review process which found all investigations to be appropriate and sufficient to address the questions posed.</p> <p>The Study's findings indicated that the increase in conveyance or water-carrying capacity of the St. Clair River is not ongoing, and based on bathymetry from 2000 to 2007, conveyance capacity has slightly decreased. In addition, the overall increase in conveyance capacity since 1971 is small relative to the degree of scientific uncertainty associated with the various analyses and data measurements. Furthermore, the conveyance capacity change is likely the result of a combination of factors, rather than any single factor.</p> <p>There are no quick solutions to raising upper Great Lakes levels since both upstream and downstream impacts of any remedial measure would have to be determined. At the same time, environmental impacts in the vicinity of the structure would have to be assessed. Proper design and construction of such measures could take considerable time and will have to take into account the potential for prevailing periods of high water. Investigation of the ability to adjust flows in the St. Clair River related to the next phase of the Study regarding improved Lake Superior outflow management may consider structural changes, but their impact on downstream water levels – Lakes St. Clair, Erie and Ontario and the St. Lawrence River – will have to be carefully assessed.</p> <p>The Great Lakes have and will continue to go through natural cycles due to various hydroclimatic factors. Similar periods of low water levels occurred in the 1930s and 1960s and may occur again. Moreover, periods of high water levels might also occur again, just as they did in the 1970s and 1980s when record highs were reached despite 150 years of changes to the connecting channels.</p> <p>You are encouraged to stay informed of prevailing hydrologic conditions on the lakes through the Environment Canada (http://www.on.ec.gr.ca/water/levels/) and USACE Corps of Engineers-Detroit District (http://www.lre.usace.army.mil/greatlakes/hh/greatlakeswaterlevels) web sites, so that you may act appropriately to protect your property and livelihood.</p>
<p>37 I attended several meetings from the upper lakes joint commission. It was only the area of the lakes itself addressed as evaporation area. In my humble opinion the catchment area should also be included in the evaporation process. By allowing clearcutting in our forests, we are losing the canopy which allows the sun to directly shine at the ground and dry the earth, so if it rains , the moisture will not be absorbed and evaporate as quickly as the rain ends. The beavers losing their habitat and cannot store water in their ponds anymore. Lawn sprinkling has been addressed</p>	<p>After extensive investigations by scientists over the last three years, the Study Board determined that the difference in water levels between Lakes Michigan-Huron and Erie is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies. As you point out, evaporation is an important factor when determining the overall hydrologic cycle affecting water supplies and lake levels. Since large-scale evaporation is difficult to measure, estimates are made using differences in other more easily measured inflows and</p>

	SUBMISSION	STUDY BOARD RESPONSE
	<p>at the meetings but I believe clearcutting is the main culprit.</p>	<p>outflows from natural systems, like river runoff and precipitation. To help determine evaporation, the Study Team directed the installation of evaporation measuring devices on Lake Superior and Huron as a check against the estimates. Since these devices are on lighthouses out in the lakes, the estimates provide values from the lake surfaces which are the largest contributor to Great Lakes basin evaporation. This is one of several important legacies of the Study, and as you will see in the final report, the Study Board requests support from the International Joint Commission to maintain these gauges in the future.</p>
38	<p>Very concerned with water levels in the Lake Huron/Georgian Bay watershed. Latest response from the IJC indicates no action or plan to manage or further develop the models for determining causes and remediation. Under what conditions and circumstances will the commission act?</p>	<p>After extensive investigations by scientists over the last three years, the Study Board determined that the difference in water levels between Lakes Michigan-Huron and Erie is primarily due not to physical changes in the river but to other factors such as variations in climate patterns affecting water supplies. The Study findings are based on sound science conducted by nearly one hundred investigators.</p> <p>The Study's findings indicated that the increase in conveyance or water-carrying capacity of the St. Clair River is not ongoing, and based on bathymetry from 2000 to 2007, conveyance capacity has slightly decreased. In addition, the overall increase in conveyance capacity since 1971 is small relative to the degree of scientific uncertainty associated with the various analyses and data measurements. Furthermore, the conveyance capacity change is likely the result of a combination of factors, rather than any single factor.</p> <p>There are no quick solutions to raising upper Great Lakes levels since both upstream and downstream impacts of any remedial measure would have to be determined. At the same time, environmental impacts in the vicinity of the structure would have to be assessed. Proper design and construction of such measures could take considerable time and will have to take into account the potential for prevailing periods of high water. Investigation of the ability to adjust flows in the St. Clair River related to the next phase of the Study regarding improved Lake Superior outflow management may consider structural changes, but their impact on downstream water levels – Lakes St. Clair, Erie and Ontario and the St. Lawrence River – will have to be carefully assessed.</p>