Commercial Navigation Workshop Summary Report

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Executive Summary

On November 5th, 2019, the Great Lakes - St. Lawrence River Adaptive Management (GLAM) Committee, a sub-committee of the International Joint Commission's (IJC) International Lake Ontario-St. Lawrence River Board (ILOSLR Board) hosted a meeting in Montreal, QC. The intent of the meeting was to gather insights from Great Lakes regional experts in the navigation industry on the potential effects of higher outflows from Lake Ontario. The information that was provided during the workshop will be used to inform the ILOSLR Board through an analysis being completed by the U.S. Army Corps of Engineers' Institute for Water Resources (IWR) on the economic impacts of halting commercial navigation on the Montreal-to-Lake Ontario portion of the St. Lawrence Seaway (Seaway) due to dangerous velocities caused by increased outflows from Lake Ontario.

Overall, the meeting was successful. There was substantial, informative discussion about the economic implications of a potential temporary closure. There was also helpful dialogue regarding the impacts of releases above the L-limit on navigation safety and efficiency (see **Figure 1**). These discussions will inform the methodologies used to estimate the economic impacts of a potential temporary closure of the Seaway to commercial navigation.

Participation in the meeting was remarkable and encouraging, with nearly 30 representatives from the regional commercial navigation industry, the St. Lawrence Seaway Management Corporation and the St. Lawrence Seaway Development Corporation (together referred to as "the Seaway Corporations") in attendance, as well as members of the ILOSLR Board, the GLAM Committee, the IJC and IWR. The level of participation highlights the importance of this issue to the community and the willingness of stakeholders to work with GLAM and IWR to accurately portray the effects of a potential shutdown.

Key findings and decisions of the workshop include those listed below, which are covered in greater detail in the pages that follow.

- The Seaway reports that, based on feedback from mariners, it is not safe to navigate, even with mitigation measures in place, when flows are greater than the L-limit (the normal maximum flow limit to provide safe conditions for navigation in the upper St. Lawrence River) plus 200 m^3/s.
- Any closure of the Seaway to navigation will have significant and lasting impacts to the commercial navigation industry and those industries that rely on the Seaway for transport of their goods. In order to accurately portray the economic impacts of halting commercial navigation on the Seaway, it will be essential for the analysis to account for the supply-chain and bi-national economic impacts associated with a stoppage.
- Closure scenarios, though all damaging to the commercial navigation industry in the Great Lakes and St. Lawrence Seaway regions, would not be *equally* damaging. Intermittent ("patterned") closures or an early closure at the end of the season would likely be the most harmful of the potential closure scenarios. Comparatively, a delayed opening of the Seaway or a single mid-season closure are expected to have a smaller magnitude of impacts, although still significant.
- The depth and accuracy of the analysis possible is dependent upon the information available to the GLAM Committee and the IWR team. The Seaway Corporations will discuss with their upper management the potential for John Martin (Martin Associates) to work with IWR economists and will provide conditions for such a collaboration. Additionally, IWR has requested data from the Seaway Corporations on daily vessel movements by commodity. All future requests for information will be coordinated through two identified GLAM leads for commercial navigation – Rob Caldwell and Melissa Kropfreiter.

I. Background, Issues, and Challenges

The IJC's ILOSLR Board is responsible for setting the outflows from Lake Ontario, in accordance with the IJC's 2016 Supplementary Orders of Approval. Plan 2014, a water level and flow regulation plan that was agreed to by Canada and the U.S. in December 2016 and implemented in January 2017, is generally used to set the outflows. The Board is authorized to deviate from that plan when levels are extreme, as set out in criterion H14 of the orders.

In late April 2019, the water level of Lake Ontario exceeded the IJC's criterion H14 upper trigger limit that applies for that time of year. Since then, the ILOSLR Board has set releases to provide all possible relief to riparians living along the shorelines of the Lake Ontario – St. Lawrence River system, balancing water levels upstream and downstream. For several weeks during May to August the release was 10,400 m^3/s, the highest sustained flow recorded since 1900. The Board's latest projections show that water levels in all of the Great Lakes are expected to be near record levels in late 2019 / early 2020, which will likely cause the ILOSLR Board to consider further increasing releases from Lake Ontario. In order to improve the robustness of future decisions on releases from Lake Ontario, the ILOSLR Board needs to quantify the impact of passing higher flows, which may cause commercial navigation on the Seaway to halt. The IWR is assisting with an economic analysis that aims to quantify the economic impacts of halting commercial navigation on the Seaway.

The ability of the ILOSLR Board to increase releases outside of the navigation season is dependent on the presence of ice in the Seaway. In the past decade (2010-2019) the Seaway has opened as early as March 20th and as late as April 2nd, while it has closed early as December 29th and as late as January 11th (though this latter date was unintentionally delayed due to severe ice problems). On average over the past 60 years, the navigation season has been slowly getting slightly longer, which leaves less of a window for the ILOSLR Board to increase flows without impacting safety conditions for navigation in the upper St. Lawrence River. In early January, once the navigation season has ended, there may be an opportunity for the ILOSLR Board to further increase flows if ice hasn't formed yet. Additionally, the ILOSLR Board may be able to increase flows during the winter, once a stable ice cover has formed. This option depends on many variables, including the thickness and roughness of the ice cover, as well as Lake Ontario and downstream levels. In early spring, after the ice has broken up and before the navigation season begins, the ILOSLR Board may have another brief chance to increase flows without impacting navigation safety conditions.

Historically, there have been a number of occasions where increased flows have affected navigation on the Seaway. In 1993, flows were set so high that Seaway traffic was interrupted for multiple periods of approximately 24 hours. More recently, in 2017 and early 2019, higher flows caused the Seaway Corporations to implement various costly mitigation measures (such as speed, passing, meeting, and draft restrictions, and tug assistance) in order to continue safe navigation. During the workshop, members of the ILOSLR Board indicated that, if Lake Ontario reaches 76.0m, Plan 2014 would prescribe an increase in releases to 10,700 m^3/s in order to lower the lake level, which could shut down the Seaway to navigation.

II. Impacts of Releases Over the L-Limit

Record high water levels on Lake Ontario have led to record high flows on the lower Seaway. As a result of higher flows, the navigation industry has implemented various mitigation measures in order to continue to safely navigate the Seaway. Typically, the L-limit (which changes based on Lake Ontario water levels) specifies the maximum flow limit to provide safe conditions for navigation in the upper St. Lawrence River. An illustration of the maximum L-limit flow in relation navigation safety is provided below in Figure 1.

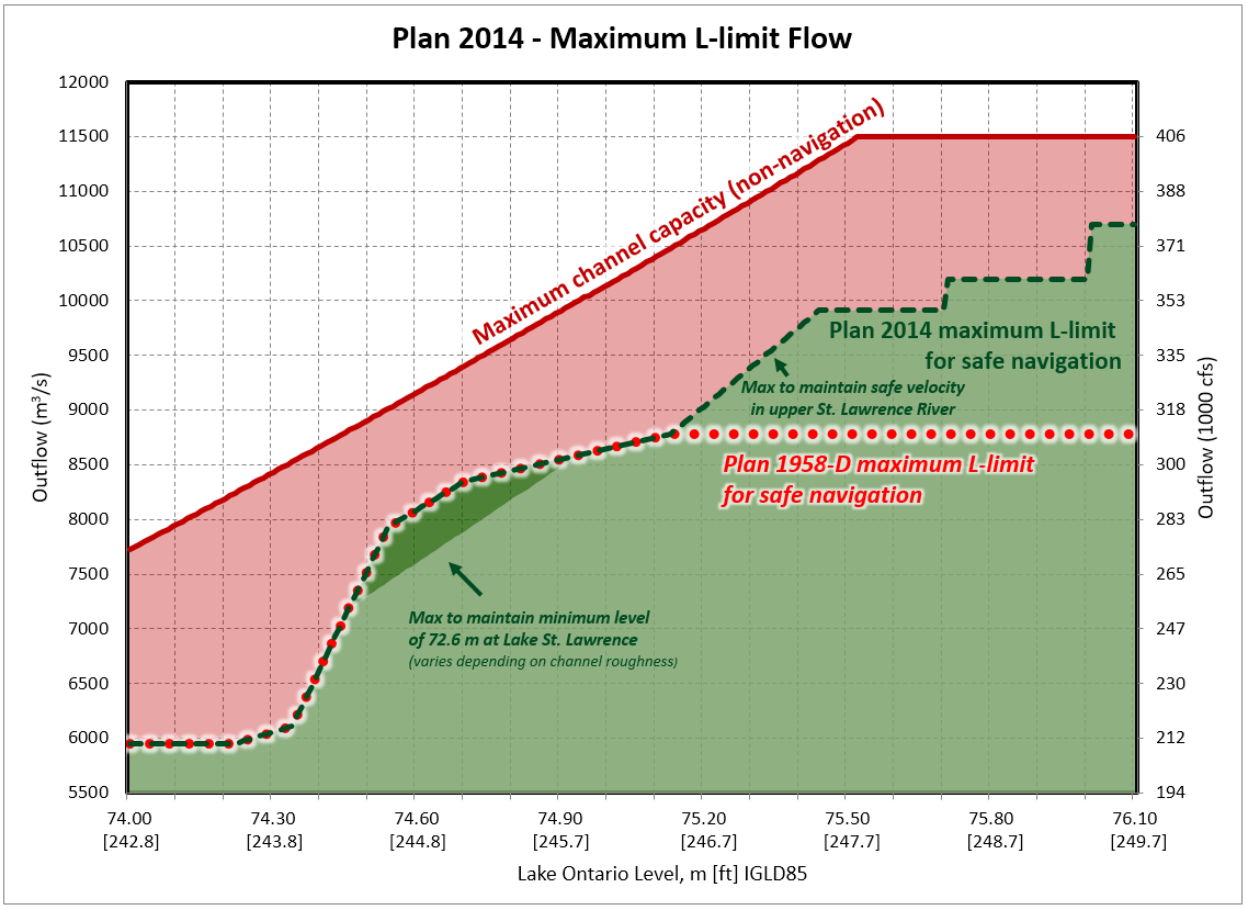

Figure 1: Plan 2014 L-limit Curve

Mitigation measures such as speed restrictions, prohibitions on vessels meeting/passing in key locations, requirements for tug assistance, and draft reductions allowed navigation to continue up to record flows of 10,400 m^3/s for 68 days in 2019 until the Lake Ontario level fell below 75.50 m. This included a period of about 20 days in August when the 10,400 m^3/s flow was 490 m^3/s above the L-limit; although industry representatives at the workshop strongly reiterated that, even with mitigation measures in place, the Seaway is not safe to navigate when flows are greater than the L-limit plus 200 m^3/s.

It is clear that high flows combined with the effects of mitigation measures has resulted in increased costs for the navigation industry. Mr. Wayne Hennessy, Director Vessel Traffic and

Customer Service for Algoma Central Corporation, provided an example of these costs. He estimates that his company's domestic fleet transit times increased by 2-3 hours per transit this year, as a result of speed restrictions necessary to navigate the Seaway under the high flows. This equates to approximately 75 vessel days, or roughly 2.5 months of vessel time. Combined with added labor costs, added fuel costs and tonnage intake reductions due to draft restrictions, his company is expecting approximately $5 million in increased costs this navigation season. Mr. Allister Paterson, Chief Commercial Officer of Canada Steamship Lines (CSL), noted that the speed limitations have increased his company's trip durations by approximately 6%, or 3 hours per roundtrip transit through the sector. In addition to making trade less efficient, the increased trip durations in difficult river currents are hard on the ships' crews and can cause even further delays if regulatory crew rest requirements are exceeded. Mr. Paterson indicated that implementing mitigation measures has resulted in an increase in CSL's costs between $1.5 million to $2.5 million so far this year. In order to capture the full economic impact that increasing flows from Lake Ontario truly has, the GLAM Committee and the IWR team will need additional information (similar to the information provided above by Mr. Hennessy and Mr. Paterson) from other regional navigation interests regarding the approximate costs associated with each of the mitigation measures put in place.

During the workshop, the GLAM Committee asked the attendees why mitigation measures wouldn't work beyond L-limit plus 200 m^3/s. While some noted that it may be *possible* to navigate the Seaway under even higher flows for a limited part of the fleet using the Seaway, the consensus was that the risks associated with doing so are too great. Multiple ship captains and industry experts clarified that it is difficult to quantify the risk of coming closer to a catastrophic failure (i.e., ships grounding or sinking, oil spills, etc.). For them, the benefits of attempting to navigate under conditions greater than the L-limit plus 200 m^3/s do not outweigh the costs of the severe consequences that could result (risks span a wide range based on vessel characteristics). The SLSMC noted that it has responded swiftly to support the ILOSLR Board in optimizing conditions to provide relief from high water levels on Lake Ontario while still ensuring the safety of navigation, and that any further incremental contribution will "push the limit of a massive economic impact".

Three questions the GLAM Committee posed to attendees, but not discussed in depth, were:

1. Why were some mitigation measures cancelled while still passing L-limit plus 200 m^3/s flows? Could this signify that the ILOSLR Board could increase flows or not?
2. Are there other mitigation measures (structural/non-structural) possible now or in the future? If so, what are they?
3. It was noted that all ships do not behave the same under high velocity/cross-current conditions. Would *any* vessel types (i.e., lakers, 'salties', integrated tug barges) continue to transit the Seaway under greater than L-limit plus 200 m^3/s flows?

Further information on these topics would be valuable to more-fully characterize the existing conditions for the ILOSLR Board. To that end, the Seaway Corporations committed to arranging

a meeting between the GLAM Committee and a group of Master Mariners to discuss in greater detail the conditions and contributing factors that determine the limitations for safe navigation and the need for mitigation measures.

III. Closure Scenario Feedback

One of the clearest and most undisputed points communicated during the workshop was that any closure of the Seaway to navigation will have significant and lasting impacts to the commercial navigation industry and other industries that rely on the Seaway for transport of their goods. John Martin, of Martin Associates, has completed considerable research on the economic impacts of navigation on the Great Lakes. He indicated that a temporary closure on the Seaway would result in long-term economic harm to ports, carriers, pilots, stevedores, importers/exporters, farmers, and U.S. and Canadian consumers. There is no doubt that the cost of a closure would be great. There is a need for the ILOSLR Board, through work being completed by the GLAM Committee and IWR, to better understand those costs in order to make more informed and better supported future decisions related to them.

Four closure scenarios were discussed during the workshop:

1. Patterning (multiple 1-3 day-long closures)
2. An early closure at the end of the navigation season
3. A mid-season closure
4. A delayed opening at the beginning of the navigation season

The patterning option was raised by many within the navigation industry, who recalled that this approach was taken in response to high levels in 1993. During that time, Seaway traffic was stopped for multiple periods of approximately 24 hours as flows were increased. This approach resulted in congestion of ships at anchorages while they waited to transit the Seaway, which led to shortages of pilots and anchorages throughout the system, including downstream of Montreal. In reality, this meant that the delay time was greater than simply the 24 hours that the Seaway was technically closed to navigation. As days are added to a roundtrip voyage, the cost per ton of shipping increases, which cuts into the shippers' competitive advantage. Other impacts stemming from a patterning type of closure include potential berth and terminal constraints at ports for loading and discharging cargo, and a lack of capacity by surface transportation to handle the increased flow of cargo that results from the bunching[1] of vessels. Multiple representatives from the navigation industry concurred that they were relieved that a patterning option is not currently being considered as there was "no worse scenario" than this.

Another potential closure scenario that was discussed was closing the Seaway to navigation earlier than usual in order to lengthen the window available to release higher flows from Lake

[1] "Bunching" refers to when vessels that were scheduled to transit days apart end up transiting hours apart due to bottlenecks caused by closures at different points in the system.

Ontario before ice begins to form. According to industry representatives at the workshop, this option would be the most damaging (after the patterning option, which is not being considered). Many of the businesses have contracts already in place, which would be impossible to fulfill if the Seaway was closed early. The Seaway already operates within a limited navigation season and industry representatives indicated that it is difficult to get major customers to align their supply chains to a 9-month season when 12-month alternatives exists. The industries have learned to work efficiently within the 9-month season, but doing so often means that the first and last months of the season are critically important to maintaining inventory stocks. The last month of the season is especially busy, as customers are stockpiling goods to get them through the winter months. One example provided of this was road salt – U.S. and Canadian communities move road salt in great volumes at the end of the season to ensure that adequate product is available for distribution to clients, including municipalities, through the winter. For example, steel mills also stockpile coal and iron ore before the end of the navigation season. Steelmakers are operating in a highly competitive industry and would be potentially crippled by a shortage of raw materials, which would have negative logistical downstream effects on steel users such as car manufacturers and the construction industry. Ontario grain, especially soybeans, is harvested in the fall and farmers deliver their crop to port terminals for export in late fall/early winter. Mr. Ian Hamilton, President and CEO of the Hamilton-Oshawa Port Authority, noted that, "An early end to the 2019 season is clearly the worst case scenario… In 2018, approximately 66 ships carrying 1 million tons of cargo went through Hamilton and Oshawa in just the last 20 days of the year. About 65% of this cargo transited the Lake Ontario to Montreal section of the Seaway. For the users of the ports of Hamilton and Oshawa, to make alternative arrangements at this late stage in the season may not even be possible. The impact would be chaotic."

The third potential closure scenario discussed was a mid-season closure. Though most agreed that, if planned long in advance, the *magnitude* of negative effects under this scenario would be less than they would for a patterning scenario or an early closing scenario, it was made clear that many of the types of impacts would be the same. A mid-season closure would create bottlenecks in the system as vessels gathered waiting for the system to re-open, and then it's expected that the vessels would rush to many of the same ports at the same time. The capacity of port infrastructure and labor would be under very high stress. Ships would need to increase their speeds in an effort to meet their schedules, which would significantly increase fuel consumption, thereby also increasing operating costs. It was also noted that a mid-season closure would be "exceedingly difficult to communicate".

Some industry representatives indicated that a delayed opening at the beginning of the season may be the "least bad" of the four closure scenarios presented. Similar negative impacts as noted in the paragraphs above are expected, however, the industry is most used to dealing with this type of closure as there are some years where the presence of ice in the Seaway causes a later opening. The end of March would be the least costly to remain closed, but remaining closed into April could still cause some catastrophic issues. The stockpiles of materials like coal, iron ore, and

grain that were created at the end of the navigation season are typically critically low by the beginning of April.

Based on the feedback provided at the workshop, any closure of the Seaway to navigation would result in the following:

- **Severe, potentially irreparable damage to the Seaway competitiveness and credibility with customers:** The integrity of the Seaway system, which is defined in large part by its safety and reliability, was noted as one of the most important aspects of the system. Navigation-related businesses are operating in a competitive environment and any closure would increase the likelihood of shippers and cargo owners looking elsewhere for more predictable and efficient ways to move cargo. Once a customer is lost, it is incredibly difficult to convince them to return to using the Seaway. Multiple sources noted that even discussing the *potential* for a closure to navigation is damaging to the industries that rely on the Seaway because it increases the uncertainty around the availability of the system. Additionally, as noted by Mr. Dave Gutheil, Chief Commercial Officer of the Port of Cleveland, scheduling predictability is especially important for the labor force of a seasonally based system. "Lack of predictability and less hours will cause workers to seek more stable jobs in other blue collar industries… Approximately 100,000 hours were worked at the Port of Cleveland docks last year and we expect that significant hours and wages would be lost due to a loss of cargo associated with a closure of the Seaway."
- **Bottlenecks in the system:** Port and other vessel-related infrastructure is finite, so it is expected that a closure would lead to more congestion at ports and on the Seaway system as users attempt to load/unload larger amounts of cargo at once. As more vessels arrive at the same points in the system around the same time, there is still only so much room and resources to load and unload those vessels.
- **Increased call for pilotage / pilot stress and fatigue**: Higher outflows from Lake Ontario have already led to an increased call for pilotage on the Seaway, and it is expected that any type of closure would make it more difficult for pilotage associations to service the surges in traffic that would result. Mr. Stephane Bissonnette, Chief Financial Officer of the Great Lakes Pilotage Association (GLPA), explained that there are already a limited number of pilots available to service all of the foreign-flagged vessels and a closure of the Seaway would certainly lead to an increase in pilot stress and fatigue, which would need to be effectively managed to promote safety. Additionally, it could also be very costly as it may lead to some pilots needing to work on their planned days of rest in order to lessen the vessel delays that would be expected from a closure. This situation is not limited to the GLPA. It also extends to others such as the Laurentian Pilotage Authority, who would likely face surges in pilot demands to deal with backlogs of ships coming in and out of the Seaway. These surges in demand create pilot shortages that impact other users, such as containerships calling into Montreal, by delaying the provision of pilotage services.

- **Crew stress and fatigue:** Similarly, multiple sources noted that a closure would increase crew stress and fatigue as crews would likely work longer hours at a time to load/unload vessels that have bottlenecked at various points in the system, while being idled at other times.
- **Negative environmental impacts:** It is expected that ships would increase their speeds when possible in an effort to meet their deadlines. Increasing speed causes vessels to burn more fuel, which comes at both a financial and environmental cost. Increasing speeds could also have negative impacts on adjacent shorelines, as the wakes created would likely be more impactful. Some cargo would be forced to move to rail and/or truck, which emit significantly more CO_2 than waterway transportation.
- **Supply chain disruptions:** Any closure could disrupt and complicate the logistics within supply chains by delaying the arrival of cargo to a given point in the system. In this sense, a closure would impact not only navigation industries, but most industries that rely on movement of goods through the Seaway. It was noted that having more input from these industries regarding how they would expect to be impacted would be very helpful to the ILOSLR Board. Example questions posed to attendees were: What would a shutdown mean for farmers? For salt miners? For steelworkers in the region? Mr. Gerry Heinrichs provided some insight from the perspective of the Western Grain Elevator Association: "Grain trade is not piling up grain in the handling system and then looking to sell it. Sales are made well in advance for delivery time, quality, and quantity, and then freight and purchasing is arranged direct from producers. Grain is shipped via rail or truck from producing regions to export positions. Any disruption to the supply chain affects our ability to meet sales, commitments and customer needs. End-use customers require a reliable and on-time delivery system as they, too, have storage and processing limitations. Once an importing customer cannot rely on a supplier (whether it be quantity or delivery), there are other options available to them and they may not be in the market for us again. Extended vessel delays at an export position translates into plugged facilities, no ability to unload rail cars, and grain back up into the origination region."
- **Rate increases:** Many of the expected impacts noted above would likely lead to increases in transportation costs, making waterway transportation on the Seaway more expensive.
- **Loss of import and export capacity:** While some commodities moved via the Seaway can potentially be re-routed to rail and truck, this is not true for all commodities. Availability of rail and truck resources is not certain, especially on relatively short notice. Additionally, re-routing cargo to rail and truck would require additional time, which is expected to lead to a loss in the total amount commodities shipped during a season if the Seaway were to close. Multiple sources at the workshop indicated that a delay of any kind would likely lead to some goods not making it to market.

IV. Sharing of Information

As noted throughout this report, the information that was provided during the workshop will be used to inform the ILOSLR Board through an analysis being completed by IWR on the economic impacts of halting commercial navigation on the Seaway due to dangerous velocities caused by increased outflows from Lake Ontario. The depth of analysis possible will depend on a willingness of the industries that use the Seaway to share data and information. The IWR and the GLAM Committee will take all possible steps to ensure that any commercially sensitive information shared remains confidential.

During the workshop, John Martin, of Martin Associates, indicated that he is currently working on a focused impact analysis which intends to characterize the effects of disrupting navigation on the Seaway. As part of this effort, he has collected data from key shippers and consignees on the Seaway system. The Seaway Corporations, along with Martin Associates, indicated a willingness to consider working in coordination with GLAM and IWR to share information. No definite agreement was made, as the Seaway Corporations would need to request approval from their leadership to enter into such an agreement. The Seaway Corporations agreed to consult with their leadership and draft an agreement with specific terms outlining the limits and requirements for further coordination. Multiple parties at the workshop were supportive of such an agreement, as it would eliminate duplicative data calls and requests for information, while also helping to ensure that both reports – the Martin Associates report and the IWR/GLAM report – base their findings on similar information. It is important to all parties involved that the results of these studies fully and accurately depict the impacts of a potential closure so that the ILOSLR Board can base any future decisions on the fullest and most precise information available. If information is not able to be shared, there is concern that the reports may have findings that don't fully align with one another, which could further complicate any future decisions that the ILOSLR Board may need to make regarding flows from Lake Ontario.

During the workshop, it was mentioned on multiple occasions that the view from the shipping industry isn't always told in a way that strikes a chord with the public and local government officials. Representatives from the ILOSLR Board requested that attendees provide more of this type of information to them if it is available. Additionally, it was noted during the workshop that it would be constructive for the commercial navigation sector to interact more closely with the ILOSLR Board in the future to ensure that they have a complete understanding of the hydraulics system. Many participants seemed unaware that the ILOSLR Board had been decreasing flows since August.

V. Roles and Jurisdiction

There was some concern voiced during the workshop that jurisdictional boundaries were being pushed in attempts to gather information for the analysis being completed by IWR. In order to avoid these issues in the future, it was agreed that any communication that affects commercial navigation will be coordinated through the GLAM Committee and the Seaway Corporations. Specifically, it was agreed that all future requests for information from IWR will be coordinated through two identified GLAM leads for commercial navigation – Rob Caldwell and Melissa Kropfreiter.

VI. Next Steps

At the workshop, it was agreed that a draft Workshop Summary Report (this document) would be completed by IWR and a review of the document by workshop participants from the commercial navigation sector would be coordinated through the Seaway Corporations.

Additionally, there are two immediate next steps resulting from the workshop:

1. The Seaway Corporations committed to arranging a meeting between the GLAM Committee and a group of Master Mariners to discuss in greater detail the conditions and contributing factors that determine the limitations for safe navigation and the need for mitigation measures. It is expected that this discussion will provide additional information needed to better characterize costs associated with mitigation measures.

2. The Seaway Corporations will discuss with their upper management the potential for John Martin to work with IWR economists and will provide conditions for such a collaboration. As part of this consideration, the Seaway Corporations will also indicate whether they are willing to provide IWR with data on daily vessel movements by commodity for the past 5-10 years. Specifically, IWR has requested Seaway data on vessel movements by date, origin, destination, commodity, tonnage, vessel name, and vessel owner in order to precisely analyze the specific movements that could be impacted within various hypothetical closure scenarios. As previously noted, IWR and the GLAM Committee will take all possible steps to ensure that commercially sensitive information remains confidential.

VII. List of Attendees

The table below includes in-person attendees, as well as those who participated in the workshop via phone/webinar.

Attendee Name	Affiliation
Chad Allen	Shipping Federation of Canada
Paul Allen	International Joint Commission
John Allis	GLAM Committee
Jean Aubry-Morin	St. Lawrence Seaway Management Corporation
Stephane Bissonnette	Great Lakes Pilotage Association
John Boyce	St. Lawrence Seaway Pilots
Jacob Bruxer	GLAM Committee
Captain Peter Burgess	St. Lawrence Seaway Management Corporation
Jean-François Cadieux	Port of Montreal
Rob Caldwell	GLAM Committee
Bryce Carmichael	GLAM Committee
Wen-Huei Chang	US Army Corps of Engineers, Institute for Water Resources
Jean D'Aquila	St. Laurent Pilots Corporation
Tony David	ILOSLR Board
Sarah Douglas	Chamber of Marine Commerce
Stacy Dufour	Canadian Coast Guard, Central and Arctic Region Search and Rescue
David Fay	International Joint Commission
Anthony Friio	International Joint Commission
Ross Gordon	Fednav Limited
Shari Grady	St. Lawrence Seaway Management Corporation
David Gutheil	Port of Cleveland
Ian Hamilton	Oshawa Port Authority
Todd Haviland	Great Lakes Pilotage Association
Gerry Heinrichs	Richardson International
Colin Henein	Transport Canada

Attendee Name	Affiliation
Wayne Hennessy	Algoma Central
Bruce Hodgson	St. Lawrence Seaway Management Corporation
Marc Hudon	ILOSLR Board
Sue Keuster	US Embassy - Ottawa
Mike Klein	CHS Minneapolis
Erika Klyszejko	International Joint Commission
Keith Koralweski	ILOSLR Board
Missy Kropfreiter	GLAM Committee
Sylvain Lachance	Laurentian Pilotage Authority
Tom Lavigne	St. Lawrence Seaway Development Corporation
Wendy Leger	GLAM Committee
John Martin	Martin Associates
Brent Mellen	US Coast Guard, Ninth District and Sector Buffalo Office
Kevin O'Malley	St. Lawrence Seaway Development Corporation
Allister Paterson	Canada Steamship Lines
Philippe Roderbourg	Fednav Limited
Lauren Schifferle	ILOSLR Board
Victor Serveiss	International Joint Commission
Mike Shantz	GLAM Committee
Dominique Simard	Corporation des pilotes du Fleuve Et De La Voie Maritime Du Saint-Laurent
Steve Stalikas	US Army Corps of Engineers, Buffalo District
Captain Eric Suave	Mid St. Lawrence Pilots Corporation
Lorne Thomas	US Coast Guard, Ninth District and Sector Buffalo Office
Bill Werick	GLAM Committee
Laura Witherow	US Army Corps of Engineers, Institute for Water Resources