Great Lakes Commission 2014 Annual Meeting

September 29-30, 2014
Buffalo, New York

Hyatt Regency Hotel & Conference Center
1- Agenda – p. 3

2- Minutes – p. 6

3- Action Items – p. 36

4- Oil Transportation – p. 46

5- Speaker Topics – p. 82

6- Workplan Update – p. 102

7- Reference – p. 123
DRAFT AGENDA
(updated Sept. 19, 2014)

Great Lakes Commission 2014 Annual Meeting
“Turning Rust to Blue: The Great Lakes New Economy”
Sept. 29-30, 2014
Hyatt Regency Hotel & Conference Center • Two Fountain Plaza; Buffalo, NY 14202

Monday, Sept. 29

All times are EDT

12-1:30 p.m.  Registration  Foyer, Grand Ballroom
1:00-5:00 p.m. Field trip: Buffalo River Cleanup and Revitalization  Coordinated by NYDEC and Buffalo Niagara Riverkeeper
5:30 – 7:30 p.m. Reception  Hyatt Regency Atrium Bar & Bistro
Appetizers and cash bar

Co-sponsored by:
• Consulate General of Canada in NY
• Honeywell

Tuesday, Sept. 30

7:00 a.m.  Continental Breakfast  Grand Ballroom
8:00 a.m.  Call to Order, Opening Remarks  Kelly Burch (PA), Acting Chair
8:05 a.m.  Welcome Keynote  Rep. Brian Higgins, 26th Dist.-NY
8:30 a.m.  Roll Call  Tim Eder, Executive Director
8:40 a.m.  Report of the Chair and Executive Director
Kelly Burch, Acting Chair
➢ Approval of final agenda
➢ Approval of minutes from 2014 Semiannual Meeting
➢ Presentation of Action Items and report of Nominating Committee

9:45 a.m.  Update on Safe Drinking Water and Lake Erie  Lake Erie states, provinces

10:10 a.m.  Break
10:30 a.m. Invasive Mussel Control Developments
Leon Carl, U.S. Geological Survey

10:45 a.m. Panel (Part I): Advancing Remediation, Restoration and Economic Revitalization
Moderator: Don Zelazny (NY), Commissioner
  - John Morris, Remediation Director, Honeywell
  - Jill Jedlicka, Executive Director and Riverkeeper, Buffalo Niagara Riverkeeper

11:30 a.m. Report on oil transportation discussion draft
Tom Crane, Deputy Director

12:00 p.m. Lunch - Regency Ballroom
Keynote speaker: U.S. EPA Acting Deputy Administrator Lisa Feldt (invited)

1:15 p.m. Panel (Part II): Advancing Remediation, Restoration and Economic Revitalization
Moderator: Bill Carr (ON), Associate Commissioner
  - John Austin, Director, Michigan Economic Center at Prima Civitas Foundation and principle investigator for the Growing Michigan’s “Blue Economy” Initiative
  - Robert G. Shibley, Dean, School of Architecture and Planning, University at Buffalo, The State University of New York
  - Mark Schollen, Principal, Schollen and Company, Inc., Landscape Architects and Ecological Restoration Consultants, Toronto, Ontario

2:30 p.m. Observer comments
Great Lakes Commission’s official Observers

3:30 p.m. Break

3:45 p.m. Business of the Great Lakes Commission
Kelly Burch, Acting Chair
  - Resolutions
    - Toledo drinking water
    - Dredging open water placement
    - Blue Accounting
  - Action item: Oil transportation
  - Elections

Tim Eder, Executive Director

4:25 p.m. Invitation to 2015 Semiannual Meeting & Great Lakes Day events
Feb. 24-26, 2015, Washington, D.C.
Tim Eder

4:30 p.m. Adjourn
Kelly Burch
Minutes

Attached, for review and approval, are minutes from the Commission’s 2014 Semiannual Meeting, held March 4-5, 2014, in Washington, D.C.

Included for your information are minutes of the Board of Directors’ meetings on Feb. 20, April 18, May 15, June 19, July 16 and Aug. 20, 2014.
Summary of Actions

1. Approved minutes of the 2013 Annual Meeting, held Sept. 9, 2013, in Milwaukee, Wis.

2. Approved four resolutions:
   - Resolution: Preventing the interbasin transfer of Asian carp and other invasive species
   - Resolution: Sustaining progress under the Great Lakes Restoration Initiative in fiscal years 2015-19
   - Resolution: Strengthening federal protections against the importation and trade of invasive species
   - Resolution: Advancing economic strength and environmental integrity for the Great Lakes region: Federal priorities for 2014


Minutes

The meeting was called to order at 1:05 p.m. EST by Ken Johnson, chair. The following Commissioners, Associate Commissioners and alternates were present or connected via teleconference:

Todd Main, Marc Miller, Stephanie Comer, Karen May - Illinois
Kay Nelson - Indiana
Jon Allan, Helen Taylor, Peter Manning - Michigan
Jim Tierney, Don Zelazny - New York
Jim Zehringer, Karl Gebhardt, Jim Weakley, Gail Hesse - Ohio
Bill Carr, Eric Boysen - Ontario
Kelly Burch, Bob Light - Pennsylvania
Eric Marquis, Frédéric Lecomte, Marc Gagnon, Eve Joseph - Québec
Ken Johnson, Steve Galarneau, Dean Haen - Wisconsin

Staff present: Tim Eder, Tom Crane, Christine Manninen, Matt Doss, Victoria Pebbles, Paul Seelbach, Erika Jensen, Gary Overmier, Elizabeth Lillard, Margaux Valenti, Michele Leduc-Lapierre, Pat Gable.

1) Call to order, opening remarks: Chairman Johnson welcomed everyone to the meeting and reviewed the agenda. Frédéric Lecomte (QC), new alternate associate commissioner, was welcomed. Tim Eder called the roll and confirmed that a quorum was present.
2) **Approval of final agenda**: Chairman Johnson called for approval of the agenda. A motion to approve the agenda was made by Commissioner Weakley (OH), seconded by Commissioner Burch (PA). The agenda was unanimously approved.

3) **Approval of minutes**: Chairman Johnson called for approval of the minutes from the 2013 Annual Meeting in Milwaukee, Wis. A motion to approve the minutes was made by Commissioner Allan (MI), seconded by Bill Carr (ON). The minutes were unanimously approved.

4) **Report of the Chair and Executive Director**: Ken Johnson delivered the chair’s report. He noted the successes we’ve had, including the delisting of the Presque Isle Bay Area of Concern in Pennsylvania. He said the successes associated with the Clean Water Act, and more recently GLRI, are of great importance to Wisconsin and the rest of the Great Lakes. Johnson also reflected on other important programs including the BEACH Act, Farm Bill and the Water Resources Development Act. The lower Green Bay and Fox River are a legacy pollution site in Wisconsin, largely due to PCBs, where the largest PCB cleanup in the world is ongoing. Johnson described the Cat Island Chain of Lakes, where a project to rebuild islands and reestablish habitat is underway. The Sheboygan River is an area in recovery. Work is ongoing in the Milwaukee River Estuary, where river natural flows are being restored. The St. Louis River is expected to be delisted by 2025. Nutrient standards have been implemented in Wisconsin since 2011. The Fox River is the largest single source of phosphorus inputs into the Great Lakes. The Great Lakes Commission is developing a nutrient trading program within the lower Fox River, in partnership with USDA-NRCS and Wisconsin DNR. Johnson noted that Wisconsin spends over $8.5M per year battling invasive species. The New Zealand mud snail is a new species of concern. Consistent ballast water regulations are important. Wisconsin is actively involved in the Ballast Water Collaborative. The Great Lakes is a managed fishery. There are increased populations of lake trout and whitefish. There is a decreased forage base, which has to be well-managed to avoid collapse. Johnson recognized the importance of binational cooperation.

The GLC staff in attendance introduced themselves. Tim Eder, executive director, elaborated on GLC project work, notably Fox P Trade and the demonstration farms project, which will demonstrate and install innovative conservation practices. The Regional Conservation Partnership Program is a new well-funded program within the Farm Bill ($275M nationally), which sets up critical conservation areas, including the Great Lakes. Approximately $12M is available for each critical conservation area. President Obama’s budget (released this week) is proposing $275M for GLRI. This is a decrease over the $300M the region has received for the past two years. The Great Lakes Ecological and Economic Protection Act (GLEEPA) has been introduced but not a lot of progress has been made in moving the bill forward. The Great Lakes region received over half a billion dollars for addressing failing drinking and wastewater infrastructure in the region. A Water Resources Development Act (WRDA) bill is under development. Eder noted that action is requested on two invasive species resolutions at this meeting, including reaffirming support for the Lacey Act and a risk-based screening process to prevent future AIS invasions. The second item pertains to the Asian carp issue and recent release of the Army Corps’ Great Lakes and Mississippi River Interbasin Study (GLMRIS) report.

5) **Invasive Species and Chicago Waterways – the Path Forward**: Tim Eder, on behalf of Marc Miller, introduced the panel: John Goss, White House Council on Environmental Quality; Joel Brammeier, Alliance for the Great Lakes; and Kay Nelson, Northwest Indiana Forum.

Goss discussed the Asian Carp Regional Coordinating Committee (ACRCC). He acknowledged USACE for their work in producing the GLMRIS report and presenting some very complex information in an understandable way. $15M in the ACRCC budget for the upcoming year. Major points: 1) continue and expand, where possible, the current and ongoing efforts to control AIS in the CAWS; and 2) initiate short-term risk reduction measures for all life stages of Asian carp at the
Brandon Road Lock and Dam. USFWS will be working with the Great Lakes states to evaluate and implement nonstructural control technologies to reduce the risk of the 13 species of most concern for transfer between the Great Lakes and Mississippi basins. Goss explained the Brandon Road Lock and Dam complex, which is of the most current interest. The lock would be extended with a channel to add an additional electric barrier to the current system. Other control tools could also be tested in the channel. Comments are requested from all parties on the GLMRIS report through the end of March. The Upper Mississippi River Basin Commission adopted a very similar resolution to what is before the Great Lakes Commission.

Brammeier acknowledged the GLC and the Great Lakes and St. Lawrence Cities Initiative for their work on the “Restoring the Natural Divide” report. He noted the great importance of what the GLC says and does on this issue. Brammeier discussed the electric barriers and the long lag time (13 years) between when Congress authorized the experimental barrier and its implementation by USACE. Given the infrastructure proposed in the GLMRIS alternative solutions, this type of long lag time will be unacceptable. He noted the spawning attempts, eDNA results and other warning signals that are reminding us that Asian carp are at the doorway of the Great Lakes at Chicago. The existing infrastructure that GLMRIS would add to is currently very broken. Brammeier said we need short-term risk reduction for the Great Lakes and we need it to happen as soon as possible. When we start talking about billions vs. millions, we need to be serious about what infrastructure improvements will actually solve for the Chicago region. These investments need to happen in parallel with solving the Asian carp problem. We need to talk about local and regional benefits that would be generated. We don’t yet understand how to quantify these benefits. We need to have a sincere and credible federal-state partnership to control AIS in the CAWS. We need to push the envelope on short-term risk reduction. Significant funds need to go toward an engineering design process. There have to be real, credible indicators of success. If we all agree that the solution is practical, and possible, then we can achieve it together.

Nelson, representing Indiana, noted that she wants to see the maritime navigation system improved and water quality protected in the Great Lakes. The Great Lakes are protected by the strict NPDES permits with strict discharge limits. Bubbly Creek was cited for its significant pollution and methane gas holdings. Indiana has significant infrastructure needs when it comes to replumbing the CAWS. Nelson supported the notion of the U.S. DOT getting involved. An additional CDF may be needed in the Chicago area. Nelson noted that the carp are not going to wait for us and short-term solutions are needed.

Commissioner Miller (IL) thanked the panelists. Miller reported that 2,000 tons of Asian carp have been removed from the river, to date, which is buying us more time. As a result, fewer and smaller fish are being seen in the areas of most concern. “Be a hero, transport zero” is a new bait bucket education program that the State of Illinois is promoting.

Q (Commissioner Allan): How do you see the solution starting to come together and coalescing with federal/state support?
A (Nelson): Ecological separation may be an option, as opposed to physical separation. We seem to agree that short-term solutions need to be the focus. I’m excited to hear that getting additional funding for USFWS will be a priority. Various treatment technologies (e.g., water gun, CO₂) are being proposed, which should be parallel activities to the larger short-term solutions.
A (Brammeier): I don’t have a lot of clarity on how USACE reached the conclusions that it did in the GLMRIS report. Flood and CSO issues in the CAWS have been there for a long time.
A (Goss): We need to have continuous improvement and risk reduction. We need to engage the local partnerships in a big way.

3
A (Brammeier): There’s a threshold for everyone. When we start spending these large amounts of money, it becomes a major investment with expectations of how that will lead to long-term prevention and control of AIS.

Q (Chairman Johnson): What are your thoughts about transfer of AIS from the Great Lakes into the Mississippi River basin?

A (Goss): We currently don’t have a plan for the two-way transfer. That has not been a focus to date.

A (Nelson): Modifying the Lacey Act to be less reactionary is a good first step. We need to stop new AIS from entering the U.S. now.

A (Brammeier): We are only going to get to a comprehensive solution for the Great Lakes if it’s also a comprehensive solution for the Mississippi. Cross-watershed political support is very necessary.

Comment (Miller): A downstream benefit would garner a lot of support.

Q (Commissioner Allan): How do we qualify these approaches when we visit our congressional offices this week?

A (Nelson): It’s very important for various approaches to happen concurrently. We need to formulate a clear, written description for our Great Lakes congressional delegation so they can formulate clear responses when questioned about these priorities by other regions of the country.

A (Brammeier): We need to educate Congress about the optimal steps that need to be taken to solve this problem.

Comment (Commissioner Manning): Reminded the GLC of an effort initiated by Attorneys General from numerous states to garner support on this issue from beyond the region.

Comment (Brammeier): You can’t sacrifice the long-term for benefit of the short.

Question (Eder): The GLC has attempted to reach out to the upper Mississippi states but hasn’t seen the same level of concern.

A (Goss): In the Upper Mississippi River Basin Commission, several of the states are also Great Lakes states, which helped to educate the non Great Lakes states about the issue. The other network that has been active is the fish chiefs from these states, who have been lobbying for resources to fight the carp issue in Ohio and other areas.

Comment (Nelson): We need to identify, early on, all the parties that will need to be part of this project and at the table when decisions are made (mostly on the regional and local levels).

Comment (Brammeier): I am not clear what we can do, even in the way of short-term solutions, without congressional authorization. This should be clarified.

6) Show ing of Project: ICE movie trailer: Chairman Johnson introduced the two sponsoring organizations of the GLC’s evening reception. Jim Ridgway, representing Environmental Consulting & Technology, and William Kleinert, with PROJECT: ICE. Kleinert spoke of his ties to the region and his documentary, which was filmed over the last three winters. The world premiere will be on March 22 at the Detroit Institute of Arts in Detroit, Mich., as part of the Freep Film Festival. The movie trailer was shown to GLC Semiannual Meeting attendees.

7) Presentation of resolutions and action items: Chairman Johnson introduced the four resolutions that will be voted on by the Commission on March 5 and asked for additional amendments and discussion from the floor.

Resolution – Preventing the interbasin transfer of Asian carp and other invasive species: This resolution recognizes the imminent threat posed by Asian carp and the ongoing concern about the interbasin transfer of aquatic invasive species (AIS); existing efforts to stop the movement of Asian
carp and develop potential solutions; and the need to define and move forward with short- and long-term actions that will address this threat.

Commissioner Allan (MI) proposed an additional Resolve clause, which would call on the U.S. DOT to study the long-term viability of the transportation system in the CAWS and multimodal options.

Associate Commissioner Marquis (QC) suggested that St. Lawrence River be added to the first two Whereases clauses.

Resolution – Sustaining progress under the Great Lakes Restoration Initiative in fiscal years 2015-19: This resolution recognizes the progress we are making in implementing the GLRI, and opportunities to enhance and continue the program for another five years to maintain our momentum and build on past investments. The resolution calls on the U.S. EPA to consult with the Great Lakes states and other regional partners to complete an update of the GLRI Action Plan for fiscal years 2015-19 that includes strengthened performance measures and actions to account for challenges that could have a material effect on the success of the GLRI, such as climate change; and calls on Congress to continue funding for the GLRI through FY2019.

There were no additional comments.

Resolution – Strengthening federal protections against the importation and trade of invasive species: This resolution recognizes the ongoing risk to the Great Lakes posed by the importation of harmful, non-native species and calls on Congress and the Executive Branch to use legislation or existing authorities to strengthen federal laws and programs to implement and expedite screening of non-native species in trade. It formalizes the GLC’s support for actions that will establish an efficient and mandatory pre-import screening process for non-native species, and strengthen federal authority to prohibit importation of those species that are determined to be injurious.

There were no additional comments.

Resolution – Advancing economic strength and environmental integrity for the Great Lakes region: Federal priorities for 2014: This resolution endorses the GLC’s suite of federal priorities for 2014; and calls on Congress and the Administration to continue to maintain base funding for Great Lakes programs and strengthen collaboration with the Great Lakes states in the implementation of the Great Lakes Restoration Initiative (GLRI).

Commissioner Haen (WI) suggested adding support for the passage of WRDA in the Resolve clause. Commissioner Weakley (OH) suggested that the two prominent WRDA items that affect the Great Lakes should be noted. These are treating the Great Lakes as a collective system and that 15 percent of revenues from the Harbor Maintenance Trust Fund should go to the Great Lakes.

8) Observer comments:

David Ullrich, Great Lakes and St. Lawrence Cities Initiative: 112 cities involved. Ullrich noted a resolution passed in January 2014 in response to release of the GLMRIS report. Process needs to move forward and be inclusive. All fronts, short-, mid- and long-term solutions need to be explored. Physical separation is the most effective solution. We need to deal with the entire transportation network, as well as flood control and water quality issues. We’ve been working on this since 1998. We need to have a greater sense of urgency. The IJC has quantified the nutrient reductions necessary to protect Lake Erie through its LEEP study. Micro-beads is another issue; several states have already banned. Climate change remains a priority.
Alan Lapointe, Shedd Aquarium: Shedd has recently formed a Great Lakes Network of zoos and aquaria, which are supportive of the GLC and its resolutions. Over 40 percent of Shedd's current programs are focused on the Great Lakes.

Russ Strach, USGS Great Lakes Science Center: Victoria Pebbles is currently on assignment to the USGS-GLSC, while Dr. Paul Seelbach is on assignment at the GLC. An MOU exists between the GLC and USGS. The Phragmites Collaborative has shown great promise, with USGS providing scientific support. Phosphorus and Asian carp science and technologies are continuing priorities.

RADM Fred Midgette, U.S. Coast Guard: Recent release of new report from the Ballast Water Working Group. 100 percent of the vessels were examined; 100 percent compliance. All vessels are required to do a full exchange or a flush. No new AIS have been detected since 2005. The USCG continues to move forward on a ballast water standard. USCG and EPA continue to meet to discuss how these standards will work in conjunction with the EPA’s general permit guidelines. Shipping heavy oils on the Great Lakes is on the table. It’s a heavily regulated industry.

Col. Fred Drummond and Jan Miller, U.S. Army Corps of Engineers: Col. Steven Roemhildt will assume command from outgoing commander Brig. Gen. Margaret Burcham. Drummond focused on the GLMRIS report and the extensive public comment period and meetings that have been conducted. The public comment period has been extended to March 31, 2014. Comments will be available on the USACE website by May 5, 2014. A handout was provided to Commissioners, which focused on sediment cleanups.

Sabrina Dadrian-Kassabian, Govt. of Canada: The Lake Simcoe Cleanup Fund was expanded to include the southeastern portion of Georgian Bay. DFO and others in the ACRCC will be undertaking a risk assessment of grass carp to prevent them from establishing viable populations in the Great Lakes. A new lab in Burlington, Ontario (DFO) will help to detect and provide rapid response to support AIS programs.

John Gasper, Argonne National Laboratory: For many years, Argonne has filled the DOE Observer role for the GLC. A new representative from Argonne, Ihor Hlohowskyj, will be taking over for Mr. Gasper.

Andy Buchsbaum and Mark Smith, National Wildlife Federation: Asian carp, nutrients and GLRI are all key issues of NWF and the Healing Our Waters-Great Lakes Coalition. Oil transport, including underwater pipelines, are a key priority of NWF, including the pipeline under the Straits of Mackinac. The Lacey Act is actually being weakened. Exempting aquaculture from the Lacey Act is being proposed and this should be addressed in the GLC’s resolution. Mark Smith reported on the Waukesha, Wis., proposal for water diversion under the Great Lakes Compact.

John Bratton, NOAA-GLERL: New modeling results are coming out soon on food web impacts. Pathogen impacts on beaches is also a focus of modeling efforts. Currents in the Straits of Mackinac is also a priority with the potential for oil spills in that area. Ice cover reached a 20-year max in the Great Lakes. Two new habitat blueprints: Muskegon Lake and the St. Louis estuary. NOAA Deputy Dr. Mark Schaefer will address the GLC on March 5.

Joel Brammeier, Alliance for the Great Lakes: The Illinois Healthy Waters Solution Program has been formed and Brammeier distributed a handout. The Alliance is pleased that the GLC is exploring the movement of petroleum on and around the Great Lakes. The volume is coming to the Great Lakes and the region needs to respond accordingly. The Alliance will host a webinar on the topic on March 27. The GLC should consider how it can stimulate public involvement on the oil/tar sands
issue. The IJC’s LEEP report was released in early March; the GLC should consider its recommendations and how it can assist.

**Kathryn Buckner, Council of Great Lakes Industries:** Buckner focused her remarks on the Great Lakes blue accounting project. The project, being conducted by the GLC in collaboration with CGLI, Univ. of Michigan Water Center and others, is asking: what do we need to know about the Great Lakes water system in order to make good choices for the future health and sustainability of the system? The CGLI would like to see the GLC elevate its economic agenda, based on three priorities that will be discussed in more detail on March 5.

**Bill Werick, Great Lakes Observing System:** Werick provided background on GLOS and its efforts to improve observing capability (e.g., real-time observations via buoys and other insitu and remote sensing technologies) throughout the lakes. GLOS is especially interested in public-private consortiums.

**Lana Pollack, International Joint Commission:** The LEEP report says there should be a ban on application of fertilizers on frozen grounds, and regulatory and non-regulatory measures. The states need to declare impaired watersheds as “impaired.” We need wetland remediation, better septic measurements, and increased monitoring. The new GLWQA includes new Great Lakes Water Quality Board membership. The GLWQB will be co-chaired by Dave Ullrich and Rob de Loë (Univ. of Waterloo).

Other comments:

**Mary Muter, Sierra Club Canada:** Muter noted the GLC’s excellent panel on Asian carp and noted that there was little acknowledgment of the binational risk assessment.

**Jim Weakley, Lake Carriers’ Association:** Commended the GLSLCI, USACE (WRDA) and USGS (new research vessels).

A motion to adjourn was made by Commissioner Taylor (MI), seconded by Associate Commissioner Marquis (QC). The meeting adjourned at 5 p.m. for a reception, co-sponsored by PROJECT: ICE and Environmental Consulting & Technology.

**Day Two**

Chairman Johnson welcomed everyone to day two, and thanked the reception sponsors from the previous evening.

Associate Commissioner Carr (ON) reported that Ontario has placed an Ontario representative, Monique Smith, at the Canadian Embassy in D.C. Carr introduced Ms. Smith.

Connecting via phone for today’s session: Louise Lapierre (QC), Bob Light (PA), Gail Hesse (OH), Eric Boysen (ON).

9) **Keynote:** Chairman Johnson introduced Dr. Mark Schaefer, NOAA assistant secretary for Conservation and Management. Schaefer acknowledged the NOAA team present. Schaefer said he has experienced first-hand the persistence and fortitude necessary to coordinate large-scale initiatives. Everyone likes to coordinate but no one likes to be coordinated. The health of the Great Lakes depends upon healthy, functioning ecosystems. Restoring these vital ecosystems is essential to the region’s people and economies. Environmental intelligence is the goal of NOAA. This is a service
our nation needs now more than ever. NOAA has removed more than 200,000 tons of waste and restored dozens of rivers. Hardened shorelines have been replaced with coastal habitat. The Muskegon Lake restoration project will bring a large return on investment ($10M invested; more than $60M in returns anticipated). Water levels have significantly declined in recent years. A new quarterly climate outlook, being developed by NOAA and partners, will be an important new product, along with the new water levels dashboard. NOAA is developing new evaporation stations, which are helping to supply data for forecast models. NOAA can’t do it alone. It depends on productive partnerships. Multiple partners (federal, state, local) are needed. Private-sector partners are also important, especially to utilize and interpret weather data. We are doing all this so we continue to live, work and play in this region and maybe even make the Great Lakes a little greater.

Comment (Commissioner Weakley): Thanked NOAA for all its great work, especially NWS forecasts and evaporation models.

Comment (Commissioner Main): From a natural resource perspective, the states and provinces would like to collaborate with the other sides of NOAA (beyond weather data). How do we not only process the data we have but how do we ask the new questions and interpret data in new ways to answer new questions about the Great Lakes? We need NOAA’s intellectual capital.

Q (Chairman Johnson): Fish passage data is an important data set that NOAA provides. However, AIS passage is a concern. What is NOAA’s policy with regard to fish passage and how it pertains to the movement of AIS?

A (Bratton): The Great Lakes ecosystem is heavily impacted by invasive species. Removing structures have pros and cons. NOAA evaluates this on a case-by-case basis and costs vs. benefits.

10) Progress report: Monitoring and Accounting of the Great Lakes Water System: Chairman Johnson introduced Dr. Paul Seelbach to provide a progress report on a new monitoring and accounting regime proposed for the Great Lakes water system. In 2013 the Great Lakes governors and the premier of Ontario called for a comprehensive approach to monitoring Great Lakes water resources. In response, a Great Lakes Commission-led taskgroup (formed at the request of the Council of Great Lakes Governors) convened in January-February 2014 and proposed adoption of the Great Lakes Blue Accounting Process, a strategy that will enable the Great Lakes community to create a consensus-based set of desired goals for Great Lakes water resources management. Seelbach explained the Great Lakes Blue Accounting project and asked the question: are the Great Lakes getting maximum value from its waters? We should be creating strategic value. We have no clear understanding about how water supports and translates into economic and social values. We must invest in the development of Great Lakes knowledge systems. We need to relate our actions to the outcomes that we are seeking. Nine desired outcomes have been developed. Three categories: 1) Healthy water and wildlife; 2) appreciated individual quality of life; and 3) flourishing communities and economies. We want to have an awareness of and a motivation/interest in protecting our waters. Blue accounting: create information supply that wraps around management of each desired outcome; summaries per subregion. A smart map (dashboard) is needed to display selected water system indicators. Four recommendations: 1) a common spatial information platform; 2) pilot modules for two outcomes (operationalize the concept for potable water and recreational economy); 3) new information development for section information gaps; and 4) collaborative, basinwide governance. The primary focus is not data but collaborative governance.

Q (Nelson): What is the funding source expected to be?

A (Seelbach): This has not been identified.

Q (Taylor): What exactly are we tracking?
A (Seelbach): We need to look at the water budget as a whole. How are we doing relative to our targets? There’s also a customer satisfaction metric. This is a supply chain framework. All partners will feed their information into the framework. Nine workgroups are anticipated.

11) Oil Transportation in and through the Great Lakes-St. Lawrence River Region: Chairman Johnson introduced Associate Commissioner Eric Marquis to moderate the panel.

Marquis reminded the Commission that the GLC staff was charged with developing an issue brief on this topic at its 2013 Annual Meeting. Marquis provided background on the issue of oil transportation through the Great Lakes region. Development of the Bakken oil fields has greatly increased the amount of crude oil being transported. Our safety regulations need to catch up. The tragedy at Lac Megantic in Québec was a tragic example of the risks associated with oil transport by rail. The goal of the GLC’s issue brief will be to objectively evaluate the issues of oil transportation in the region.

Dr. Susan Christopherson, Cornell University, discussed the surge in rail transport of crude oil in the Great Lakes states and provinces. Rail is being used to increase capacity and flexibility. This is not a choice between pipelines and rail. The shippers actually prefer rail because it provides flexibility as shale plays change in profitability and increases shipping capacity beyond that provided by pipelines. Pipelines are very expensive, long-term investments. Derailments are going to occur when we have this industrial activity occurring. There are significant costs to the states, provinces and local communities to prevent and respond to these incidents. Infrastructure risks include the safety and reliability of the equipment; the scale of the trains and effect on track condition; and unsafe crossings. There are also contextual risks, including routing through highly populated areas, vulnerable populations, train routes proximate to critical waterways and environments, financial accountability for accident follow-up and security risks. The U.S. National Transportation Safety Board has acknowledged that existing regulatory policy and capacity are not sufficient to address the risks to the public.

Dr. John Felmy, chief economist for the American Petroleum Institute, discussed energy opportunities, including deep water drilling, hydrofracking, and the western oil reserves. The United States is now the largest producer of natural gas in the world. The industry supports over 10 million jobs. The economic impacts should be examined as well as the potential environmental impacts. The energy sector is prepared to make investments where necessary. Felmy showed a map showing the locations of U.S. refineries. Dramatic increases in oil production are occurring in North Dakota. Shipping heavy materials is nothing new. Every incident that happens is one too many but it’s important to remember that what’s being carried in the tanks does not cause the accidents. The petroleum industry is open to improvements. Oil and gas is 62 percent of the United States’ current energy supply. Moving 1.4 million barrels per year is a challenge.

Q (Commissioner May): Looking at the 14 derailment incidents, were the causes of the accidents evaluated?
A (Christopherson): All these accident investigations are ongoing so this information isn’t immediately available.

Q (Commissioner May): Is the crude being processed at Great Lakes refineries? What are the economic impacts?
A (Felmy): The ability to ship crude to the east coast refineries kept these refineries open. 500,000 to 1 million barrels per day are being processed in east coast refineries.
A (Christopherson): Economic impacts do not necessarily occur where the activity is occurring. Houston, Texas, is benefiting greatly economically from the crude movements. This is where most of the job growth is occurring, along with Louisiana. The Port of Albany, in contrast, is only getting 100
or so jobs. The job creation is not necessarily occurring in the areas where the trains are running through.

Comment (Commissioner Burch): My new title for PADEP is executive director of oil and gas operations. Refineries in Philadelphia are thriving. There are lots of byproducts from the drilling industry. Transportation will play a key role.

Comment (Commissioner Zehringer): The oil has reshaped eastern Ohio, but we want to make sure that it’s moved safely.

Comment (Christopherson): There’s always job growth in the boom cycle. The question is: where is the job growth occurring, who is being employed (are they residents or transient workers), and how long will the jobs last?

Q (Commissioner May): Are there not enough tanker cars to ship all the crude? How do we move things along to get more of the new, safer cars?

A (Felmy): The industry will move this along. Criteria for the cars need to be determined and this question should really be addressed to the tank car manufacturers. I don’t have a good answer about what percentage of the crude is being shipped in new safety-oriented, double-hulled cars.

Comments from Observers:

Kay Nelson, Northwest Indiana Forum: We lose when we drag. Plastic water bottles come from petroleum. We need to look forward, not backward. We depend on a lot of petroleum products on a daily basis. Modernizing a refinery in northwest Indiana was a large success.

Andy Buchsbaum, National Wildlife Federation: The energy sector provides a large number of jobs in the Great Lakes region; however, job creation does not come for free. There’s a shift in the type of jobs. When we consider having the Great Lakes become the energy/transportation hub for the United States, we need to consider all the impacts. More than 545 pipeline incidents have spilled over 4.1 million gallons over the past four years in the Great Lakes region. The Enbridge Company was responsible for the largest inland spill in U.S. history. The Pipeline Hazardous Material Safety Administration (PHMSA) has not developed regulations to ensure that pipeline risks are adequately assessed. A 60-year-old pipeline runs under the Straits of Mackinac and is a disaster waiting to happen.

Kathryn Buckner, Council of Great Lakes Industries: Comments from CGLI members include the necessity to ensure safety. Strong regulatory regimes are already in place. Government needs to have a willingness to reassess the programs and regimes. It’s important to harmonize regulations between the United States and Canada. It’s important to recognize the economic importance of these industries.

Joel Brammeier, Alliance for the Great Lakes: This is a choice for the Great Lakes region. An increased volume of tar sands crude oil will be coming into the Great Lakes region and we will be faced with choices of how to move these products around. We don’t know if we can handle a heavy crude oil spill in the Great Lakes.

Jim Weakley, Lake Carriers’ Association: LCA represents several oil tankers. There are no single-hulled tankers operating on the Great Lakes except a National Park Service vessel on Lake Superior. Not aware of any oil spills on the Great Lakes from oil being moved as a cargo.

12) Keynote - LaTourette: Commissioner Zehringer (OH) introduced the keynote speaker, former Congressman Steven LaTourette. LaTourette currently serves as chair of the Northeast-Midwest Institute. LaTourette noted that he served 18 years in the U.S. Congress serving Ohio’s district west of Cleveland. He said that bipartisanship is in short supply. Before sitting down with colleagues, and getting 60 percent of what your want was viewed as a good day. Today everyone wants 100 percent.
The Great Lakes states are losing congressional districts, which is causing the region to lose influence in Congress. How do we replace all the influence and clout that we’re losing with recent and upcoming retirements (Rep. Dingell, Sen. Levin, etc)? The goal should be to identify problem solvers in Congress rather than problem makers. A huge breakthrough occurred when President Obama initiated the Great Lakes Restoration Initiative. LaTourette commended Rep. David Joyce who took over his seat in Congress for his work to restore funding at $300M for the GLRI. The Ryan-Murray budgets will bring new negotiating. The GLRI and the Land and Conservation Fund will be likely targets for decreases. Lots of competing demands and a strong congressional voice from California. Not every issue needs to be partisan. That’s how we get stuck. There’s nothing partisan about Great Lakes water quality and invasive species. Congress is not a complicated business. The team with the most votes wins.

Comment (Eder): Eder commended the NEMW Great Lakes Task Force. Great Lakes members of Congress should be encouraged to be part of the Task Force, if they’re not already ($1,000/year in dues).

Comment (LaTourette): NY’s ballast water standards could not be met. NEMW is paving the way and certifying the new technologies that are leading the way for complying with consistent ballast water standards.

Q (Danielle Chesky): Where should the focus be on moving GLRI along and its authorizations?
A (LaTourette): Charlie Dent, Tim Ryan, Betty McCollum are strong advocates. Look at the roster of the Appropriations Committee. Rep. Joyce basically gave the ultimatum that if the money for GLRI wasn’t restored, he was going to vote no on the bill.

13) **Resolutions:**

**Resolution – Preventing the interbasin transfer of Asian carp and other invasive species:** Commissioner Nelson (IN) proposed an amendment to the third Resolve clause to say “ecological and/or physical separation.” The amendment was seconded by Commissioner Weakley (OH). The amendment carried. Commissioner Allan (MI) proposed the USDOT amendment (new Resolve clause), which calls on the U.S. Department of Transportation to conduct a study on the current status, projected trends and infrastructure and related needs to support the long-term economic viability of commercial transportation on the CAWS. Seconded by Commissioner Nelson (IN). The amendment carried. A motion to approve the resolution, as amended, was made by Commissioner May (IL), seconded by Commissioner Prettner Solon (MN). The resolution passed unanimously. Commissioner Allan (MI) recognized the importance of this resolution and thanked the staff and board for its leadership.

**Resolution – Sustaining progress under the Great Lakes Restoration Initiative in fiscal years 2015-19:** A motion was made to approve the resolution by Commissioner Zelazny (NY), seconded by Commissioner May (IL). The resolution passed unanimously.

**Resolution – Strengthening federal protections against the importation and trade of invasive species:** Commissioner May (IL) offered an amendment to the first Resolve clause to add “and reduce the risk of introduction of injurious, non-native wildlife and associated diseases through the trade in live animals.” Commissioner Taylor (MI) moved the amendment; seconded by Commissioner Weakley (OH). The amendment carried. There was no further discussion on the resolution. A motion to approve the resolution, as amended, was made by Commissioner Allan (MI); seconded by Commissioner Zehringer (OH). The resolution passed unanimously.
• **Resolution – Advancing economic strength and environmental integrity for the Great Lakes region:** Federal priorities for 2014: Amendments were made by Wisconsin to add a bullet to the first Resolve clause focused on passing water resources development legislation that supports maritime infrastructure in the Great Lakes. A motion to approve the amendments was made by Commissioner Weakley (OH), seconded by Commissioner May (IL). The amendment carried. Amendments were made by Ohio to add additional text to the same bullet to direct at least 15 percent of annual appropriations from the Harbor Maintenance Trust Fund to the Great Lakes and authorizing the Great Lakes Navigation System as a single, integrated navigation system for purposes of budgetary planning and allocation of federal funding. A motion to approved the Ohio amendments was made by Commissioner Haen (WI), seconded by Commissioner Nelson (IN). The amendment carried. A motion to approve the resolution, as amended, was made by Commissioner Weakley (OH), seconded by Commissioner May (IL). The resolution passed unanimously.

Details of all revisions, including grammatical changes made to the resolutions, are available upon request.


A motion to adjourn the meeting was made by Commissioner Taylor (MI), seconded by Commissioner Rest (MN). The meeting adjourned at 3:55 p.m.

Respectfully submitted,

Tim A. Eder
Executive Director

/cm
The meeting was called to order at 10:00 a.m. EST by Ken Johnson, chair. The following members were present:

- John Davis - Indiana
- Jon Allan - Michigan
- Lt. Gov. Yvonne Prettner Solon - Minnesota
- Jim Tierney, Don Zelazny - New York
- Jim Zehringer, Karl Gebhardt - Ohio
- Bill Carr - Ontario
- Kelly Burch - Pennsylvania
- Eric Marquis, Kerith Iverson-Vosters - Québec
- Ken Johnson, Steve Galarneau - Wisconsin

Staff present: Tim Eder, Christine Manninen, Tom Crane, Matt Doss, Erika Jensen.

1) **Introduction and call objectives:** Chairman Johnson welcomed everyone to the call and reviewed the agenda.

2) **Minutes:** A motion to approve the Jan. 28 and Feb. 13, 2014, minutes was made by Commissioner Allan (MI), seconded by Commissioner Zehringer (OH). The minutes were unanimously approved.

3) **Semiannual meeting agenda and plans:** Eder reviewed the agenda for the Semiannual Meeting, which will be held March 4-5 in Washington, D.C. There will not be a Great Lakes Protection Fund-hosted dinner, as in past years. The GLC meeting will begin at 1 p.m. EST on Tuesday, March 4, and adjourn at noon on March 5 for a joint lunch with the Healing Our Waters – Great Lakes Coalition. U.S. EPA Administrator Gina McCarthy will speak at the joint luncheon but she won’t be there until 2:15 p.m. Board members were encouraged to attend if their schedules permit. An evening reception will be held at the Canadian Embassy on Wednesday, March 5. The congressional breakfast will be held on Thursday, March 6, beginning at 8:30 a.m. in the Senate Hart Building.

Associate Commissioner Marquis noted that on the oil transportation panel, more balance may be needed as the American Petroleum Institute (API) will be viewed as an industry lobbyist. Eder explained that two GLC Observers (Alliance for the Great Lakes and the National Wildlife Federation) have done separate reports on oil transport issues, but primarily looking at pipeline and ship transport issues, not rail. The GLC wants to ensure that its panel discussion is focusing on all modes of transportation so the staff chose not to include the NGOs on the panel. They could, however, be invited to contribute to the conversation following the panel presentations.

Commissioner Tierney noted that Albany, N.Y., has turned into an oil hub with a lot of rail traffic. Eder indicated that the other panelist, Susan Christopherson, has done extensive research on the port of Albany.

Commissioner Zelazny asked about the water accounting progress report and if we might be getting out ahead of the governors since they’ll be meeting in April. Eder explained that this is being well
coordinated with CGLG and the GLC presentation will be seen as a dry run for the governors’ presentation the following month.

4) **Semiannual meeting resolutions**: Eder noted that if more time is needed to approve the Asian carp resolution, the final draft resolution may not be able to be included in the briefing books this week but, instead, will be distributed separately. Discussion followed on the four draft resolutions.

- **Strengthening federal protections against the importation and trade of invasive species**: no edits.

- **Advancing economic strength and environmental integrity for the Great Lakes region**: Federal priorities for 2014: no edits.

- **Sustaining progress under the Great Lakes Restoration Initiative in fiscal years 2015-19**: Commissioner Galarneau suggested that a Whereas might mention the GLRI accomplishments to date. Chairman Johnson suggested language that could note the delisting of some AOCs and other success stories. The Board agreed with this recommendation. Commissioner Zelazny suggested a plug for the state capacity funds. Eder referred to the sixth Whereas clause. In addition to the sixth Whereas, Zelazny suggested a kudo be thrown to GLRI noting that federal funds have supported additional state capacity building. Zelazny’s suggestion will be added to Galarneau’s suggestions and the staff will draft an additional Whereas clause.

- **Preventing the interbasin transfer of Asian carp and other invasive species**: Eder noted that the ACRCC, CGLG and others are all coalescing on this issue, which is encouraging. Chairman Johnson said that Wisconsin built a lock and dam on the Fox River (in the past) and he suggested that this be included in the resolution. The Board concurred.

Commissioner Prettner Solon suggested that the 14th (third from last) Whereas clause be a Resolve clause instead.

Commissioner Allan suggested a new Resolve clause, which would address what we would do (at an escalating basis) if the carp start advancing closer to Brandon Lock. How do we give USACE a triggering mechanism to potentially close Brandon if the fish are at the doorstep? We need to deal with this risk. John Davis (Indiana) said that USACE seems to have the authority to do some drastic control measures, if/when necessary. Allan said we need clarity about what the steps are in dealing with this risk. A risk escalation strategy should be written with built-in triggers. Commissioner Allan suggested that the ACRCC draft the strategy, in collaboration with the CGLG AIS Task Force. Eder suggested that Commissioner Allan and the staff put some draft language on paper, which could then be considered when this resolution is discussed in D.C. Davis (Indiana) said the ACRCC has an emergency response plan, which should be fully considered in these discussions.

Commissioner Zelazny asked about the last Resolve clause and why the Dept. of Interior is delegated to take the lead role in the federal response. Eder and Commissioner Allan explained that there’s longstanding frustration with USACE, and language in new federal legislation is suggesting that USFWS might be able to tackle the issues on a broader regional and national scale. Commissioner Prettner Solon noted a typo in the sixth Resolve clause: “are will” should be “are willing.” Associate Commissioner Carr suggested adding “prevention and enforcement, surveillance” to this same Resolve.

5) **2014 federal priorities**: Eder reported that the federal priorities document is at the printer. He reminded the Board that the one-page list of shared priorities is also in production with regional partners. The GLC is also preparing factsheets showing all the GLRI-funded projects for each state, which will be distributed in D.C. Lastly, Eder reported that Obama’s budget is likely not going to
include $300M for GLRI this time around and will be less. Obama’s budget is expected to be released on March 3 or 4.

6) GLC FY2015 budget: The Board reviewed a memo prepared by Tom Crane, deputy director, and Joe Bertram, financial manager, which outlined the proposed schedule for development, review and approval of the GLC’s 2015 budget. The Board will need to appoint a finance committee to review the draft budget and participate in 1-2 conference calls over the March-May timeframe. Chairman Johnson asked for volunteers. The GLC budget must be adopted at least 45 days prior to July 1.

7) Upcoming Meetings:
   - March 4-5, 1:00 PM EST – Semiannual Meeting, D.C.
   - March 6, 8:00 AM EST – Breakfast reception and Hill visits, D.C.
   - April 17, 10:00 AM EST – Board call

The meeting adjourned at 11:05 a.m.

Respectfully submitted,

Tim A. Eder
Executive Director

/cm
The meeting was called to order at 11:00 a.m. EDT by Ken Johnson, chair. The following members were present:

Todd Main      - Illinois
Jon Allan      - Michigan
Lt. Gov. Yvonne Prettner Solon    - Minnesota
Don Zelazny      - New York
Mike Bailey (for Jim Zehringer), Karl Gebhardt - Ohio
Lori Boughton (for Kelly Burch)    - Pennsylvania
Eric Marquis      - Québec
Ken Johnson, Steve Galarneau - Wisconsin

Staff present: Tim Eder, Christine Manninen, Tom Crane, Matt Doss, Paul Seelbach, Joe Bertram (via phone), Gary Overmier.

1) **Introductory remarks and call objectives:** Chairman Johnson welcomed everyone to the call and reviewed the agenda. Chairman Johnson announced that he will be retiring May 8 from Wisconsin DNR. He will continue as chair of the GLC through September 2014.

2) **Minutes:** A motion to approve the minutes from the Feb. 20, 2014, call was made by Commissioner Allan (MI), seconded by Commissioner Prettner Solon (MN). The minutes were unanimously approved.

3) **Review draft FY15 budget:** Eder reported that the Finance Committee met April 11, including Commissioners Prettner Solon and Galarneau, and Associate Commissioner Marquis. A call with all Commissioners is scheduled for May 6 to review the draft budget. The new budget will begin July 1, 2014. The budget, when fully vetted, will be approved by the Board of Directors. The proposed budget is $15.772M, a 9.3% increase over the previous year’s budget. A large portion of the increase is due to a three-year, $30M habitat restoration partnership with NOAA. Eder explained that the budget includes support for three unfilled or new staff positions. Two of the positions are filling existing vacancies for employees in the GIS and IT support areas that have left the GLC over the past two years. The third position is a new one-year, term-limited position to support the Fox P Trade project. Tom Crane explained that equipment budgets are now being logged in the Office Supply category in the restricted fund budgets. State dues will remain the same at $60K per year per jurisdiction. Commissioner Allan asked how many FTEs are dependent on the restricted fund budget vs. the general operating budget. Eder responded that approximately 12-14 employees are entirely funded on grants & contracts (restricted funds). Only a few staff (e.g., Joe, Pat) are fully dependent on the general operating budget. The Board will be asked to approve the budget on its May 15 conference call.

4) **Blue Accounting report and recommendations:** Eder introduced Paul Seelbach, who explained the Great Lakes Blue Accounting report, which was recently produced by the GLC and a regional workgroup and will be presented to the governors and premiers at their meeting on April 25. The
GLC will be asking the governors and premiers to support this concept but there isn’t a formal “ask” at this time with regard to funding. The states and provinces will be asked to assign a senior person to work with the GLC and its partners on the implementation phase of the project if it moves forward. Seelbach walked through a set of Powerpoint slides that will be presented to the governors and premiers. He cited “a safe and sustainable water service infrastructure” as an example topic that could be tracked through the water accounting process, as proposed. Blue accounting is a shift in the logic and, consequently, the monitoring programs in order to better serve decisionmaking. Recommendations include: 1) developing a common regional monitoring agenda; 2) deployment of joint strategies to reach each of the Desired Outcomes for the region; 3) the use of existing governance platforms but refining and realigning them; and 4) early action through pilot demonstrations to prove the concepts and importance of water accounting. The goals are economic efficiencies, improved water security, and improved quality of life aspects. An integrated, outcome-based water monitoring effort is the ultimate goal. Chairman Johnson suggested keeping the nine Desired Outcomes on the screen so the audience can refer back to them throughout the presentation. The categories (Environmental, Economic, Social) of the nine Desired Outcomes should be clear in the presentation. Commissioner Zelazny suggested that “competitive advantage” be better defined. Eder explained that better alignment of existing resources might lead to big efficiencies for the region. There are some start-up costs but the governors are not being asked to fund this up front. Chairman Johnson suggested we say “informing” decisions instead of “empowering” decisions.

5) Regional Conservation Partnership Program: The new Farm Bill is beginning to be implemented. The Great Lakes Basin Program for Soil Erosion and Sediment Control (Basin Program) is recognized and will continue to be administered by the GLC as long as the GLRI exists. However, the Basin Program and other regional programs are being discontinued and rolled into a new Regional Conservation Partnership Program. The Great Lakes is expected to be designated as a Critical Conservation Area, which will make the region eligible for additional funding opportunities. Matt Doss discussed a memo to the Board, which outlines various funding opportunities, including a state competitive process ($68M available), a federal competitive process ($110M available) and through eight designated conservation areas ($96M available nationwide). The legislation prohibits the use of funding for administrative costs, which is a concern for costs associated with managing these large on-the-ground projects. The GLC continues to be in discussions with USDA-NRCS to discuss the GLC’s potential role in implementation of these programs. Commissioner Allan noted that there seems to be a shift moving toward less administrative and technical support. Gary Overmier noted that the GLRI is eating up a lot of the region’s technical capacity, which is a challenge not faced by other regions of the country. Doss noted Sen. Debbie Stabenow’s leadership on passage of the Farm Bill. Commissioner Zelazny asked if matching funds will be required. Eder explained that there is an expectation that dollars and resources will be brought to these programs outside of the federal contributions, however, a stipulated amount of cost-share has not been stated.

6) Alternate Commissioners: Eder explained that there isn’t a clear mechanism for appointing alternate commissioners to the GLC. A proxy can be designated but there isn’t a formal recognition of alternate commissioners. Eder suggested that a bylaw amendment may be necessary to remedy this. Eder will prepare a simple bylaws amendment to this affect, which could be proposed and voted on at the Annual Meeting.

7) Upcoming Meetings:
   - May 15, 10:00 AM EST – Board call
   - June 19, 10:00 AM EST – Board call
   - July 17, 10:00 AM EST – Board call
   - Aug. 21, 10:00 AM EST – Board call
   - Sept. 18, 10:00 AM EST – Board call
o Sept. 29-30 – Annual Meeting: Buffalo, NY

The meeting adjourned at 12:04 p.m.

Respectfully submitted,

Tim A. Eder
Executive Director

/cm
The meeting was called to order at 10:00 a.m. EDT by Ken Johnson, chair. The following members were present:

- Todd Main, Illinois
- Jon Allan, Michigan
- Jim Tierney, New York
- Karl Gebhardt, Mike Bailey (for Jim Zehringer), Ohio
- Trevor Snyder (for Bill Carr), Ontario
- Kelly Burch, Pennsylvania
- Kerith Iverson-Vosters (for Eric Marquis), Québec
- Ken Johnson, Steve Galarneau, Wisconsin

Staff present: Tim Eder, Tom Crane, Joe Bertram, Paul Seelbach and Matt Doss.

1) **Introductory remarks and call objectives:** Chairman Johnson noted that he will be retiring as of July 3. He originally intended to remain Commission chair through September. However, he has learned that the WI DNR Board member must be a state employee. Thus, as of his last day on state payroll, July 3, he will no longer be the Wisconsin Board representative. Commissioner Kelly Burch will become the Acting Commission chair on that date.

2) **Minutes:** A motion to approve the minutes from the April 19, 2014 call was made by Commissioner Tierney (NY) and seconded by Commissioner Allan (MI). The minutes were unanimously approved.

3) **Approve Final FY15 budget:** Eder noted that he sent out final budget materials following their review on the last Board call. A call was held to allow Commissioners an opportunity to ask questions. No concerns or issues have been raised and the budget is presented for the Board’s approval. Chairman Johnson thanked those who helped review the draft budget. Commissioner Allan asked about the amount provided for merit increases. Eder responded that it is set at 3% based on the consumer price index, previous year’s increases and other factors. It was noted that this is consistent with the Great Lakes Protection Fund. It was asked how many full time staff the Commission has: 22 full time staff, plus Sea Grant and Quebec fellows. Two vacant positions are being filled and one limited-term hire. Commissioner Tierney noted, with state dues of less than $500,000, to have a budget of $15 million is a major accomplishment and a great return on investment. He recognized and thanked the Commission staff for this. A motion to approve the budget was made by Commissioner Tierney (NY) and seconded by Commissioner Gephardt (OH); the budget was approved unanimously.

4) **Personnel Update:** Eder noted that the interagency personnel exchange with USGS is being extended for two months, with Victoria Pebbles and Paul Seelbach. The Commission is moving forward with the hiring of a senior director to focus on information technology, the position held previously by Roger Gauthier. This individual will help advance the Blue Accounting report recently presented to the Council of Great Lakes Governors, among other efforts. We are moving forward with a salary and benefits benchmarking evaluation as requested by Commissioner Johnson. We are also updating our personnel policies and Eder asked for volunteers from the Board to assist with this process. Commissioners Johnson, Allan and Bailey agreed to assist (with Steve Galarneau and Russ...
Rasmussen backing up Chairman Johnson, if needed). The updated policies ultimately will be approved by the Board.

5) Chicago Waterways and Asian Carp Update: Eder reviewed progress in this area. Staff have circulated the resolution on this topic adopted in March and have discussed FY 2015 funding for the Army Corps of Engineers to support work in this area. We have secured $200,000 from the GLRI to hire two facilitators, Gail Bingham and Tim Brown, to assist with the Advisory Committee and mediate differences of opinion on the committee. They have been well received by the Advisory Committee and Executive Committee. There have been some pivotal recent meetings with the Corps and other entities that have generated a rough outline of a modified separation alternative that may have promise. There was a question about the Commission’s funding recommendation for the Corps. Eder explained that we are proposing that the Brandon Rd. lock and dam be used a demonstration site for various technologies that might prevent AIS movement. Our estimate to continue this work was about $8 million. Sen. Levin felt this was too high, given the President’s $3 million request, so reduced his request to this level. In addition to the Corps’ base budget, the GLRI is supporting about half of current Asian carp efforts.

6) Blue Economy (Restoration to Economic Revitalization) Options: Eder noted that the memo sent to the Board is just a “think piece” prepared by staff who are considering this issue. The Blue Economy and moving from restoration to economic revitalization will be the theme of the fall annual meeting. A key question is what role a regional entity such as the Commission can play in this area. We invite reactions and suggestions, including potential resolutions and action items at the annual meeting. Commissioner Allan noted that Michigan’s three major research universities have formed a University Research Corridor that will soon release a report on the role of water in the Great Lakes region. He cautioned that this is a crowded space and we need to be aware of other efforts, and suggested that staff assess major initiatives in this area. We need to make sure we “jump in” in the right way. Commissioner Main agreed that we should consider the appropriate space for the Commission to engage, so the first step should be to consider the overall landscape and where our value added role can be. Our role may be better to “steer” rather than “row.” Chairman Johnson noted the work of the University of Wisconsin on water-related economic development.

7) Annual Meeting Planning: Eder noted that Gov. Cuomo has invested a billion dollars in western New York, which will fit well with the restoration and revitalization theme of the annual meeting in Buffalo. Commissioner Tierney noted the array of remediation and restoration actions underway on the Buffalo River and said it will be great to showcase what these investments and partnerships can accomplish. Eder noted that a Buffalo River fieldtrip was being planned for Monday afternoon before the meeting followed by an evening reception. The meeting will be Tuesday from 8:00 am to 4:30 pm. A recommended theme will be “Rust to Blue” or something similar, emphasizing the economic development that can take place following ecological restoration. We invite suggestions on the draft meeting agenda from the Board, along with ideas for resolutions and action items, particularly those related to the meeting theme, such as economic and infrastructure investments, etc. Elections for Commission chair and vice chair will also take place at the meeting. Commissioner Tierney asked if other entities would be meeting in conjunction with our meeting. Eder responded no, that the IJC is on a triennial cycle now and the HOW coalition is meeting in Grand Rapids. There was general support for the draft meeting agenda.

8) Oil Transportation Report Update: Eder noted that we have formed a strong team that is beginning work on the report. A revised outline was circulated. This is a large and complex issue, and we are trying to be reasonable about what we can accomplish. We don’t have dedicated funding to support the work, but will be using some general operations funds to support a graduate student from Cornell University, a summer intern and with our current Quebec fellow. Eder raised two issues: 1) We recommend the report be presented at the annual meeting as an interim report and then finalized following the meeting; and 2) We have asked Commissioners Allan, Burch, and Marquis to serve as an ad-hoc task force to help guide our work and review the report as it develops over the next several
months. They have agreed to assist in this capacity. We are excited about this work and are in good shape to provide a quality product in Buffalo.

9) **Upcoming Meetings:**
   - **June 19, 10:00 AM EST** – Board call
   - **July 17, 10:00 AM EST** – Board call
   - **Aug. 21, 10:00 AM EST** – Board call
   - **Sept. 18, 10:00 AM EST** – Board call
   - **Sept. 29-30** – Annual Meeting; Buffalo, NY

The meeting adjourned at 11:00 a.m.

Respectfully submitted,

[Signature]

Tim A. Eder
Executive Director

/md
The meeting was called to order at 10:00 a.m. EDT by Kelly Burch, acting chair. The following members were present:

- Todd Main - Illinois
- Jon Allan - Michigan
- Jim Tierney, Don Zelazny - New York
- Andy Ware - Ohio
- Bill Carr - Ontario
- Kelly Burch - Pennsylvania
- Steve Galarneau - Wisconsin

Staff present: Tim Eder, Tom Crane, Matt Doss and Bryan Comer.

1) **Introductory remarks and call objectives:** Acting Chair Burch (PA) chaired the call and asked for comments on the agenda. There were none. Executive Director Eder reviewed the status and process for preparing the issue brief on oil transportation.

2) **Minutes:** A motion to approve the minutes from the May 15, 2014 call was made by Commissioner Tierney (NY) and seconded by Commissioner Allan (MI). The minutes were unanimously approved.

3) **Review plans for Farm Bill Regional Conservation Partnership Program Proposal:** Eder reviewed the new Regional Conservation Partnership Program (RCPP), noting that it replaces the Great Lakes Basin Program for Soil Erosion and Sediment Control, which the GLC has administered for over two decades. The Great Lakes now will compete for nearly $400 million under the program in FY 2014/2015. The GLC proposes to submit several preproposals, due July 14. We have started discussing these project ideas with NRCS and others. NRCS is seeking partnerships with large match to complement federal funding, and will not allow use of federal funds for administrative costs. This could be a challenge for the GLC. Eder referred to the memo summarizing the three project concepts and briefly reviewed them. Regarding a potential phosphorus trading project in the Saginaw River/Bay area, Eder noted that new information from MDEQ may make this specific area not viable, so this element of the proposal will be dropped.

Commissioner Zelazny (NY) noted that New York has discussed potential projects and has identified similar concerns. They are on the fence, but are interested in discussing with the GLC the demonstration farms project idea. Alternate Commissioner Ware (OH) stated that they are working with several state departments and the State of Michigan, aiming to get as many on-the-ground projects underway as possible, including controlled drainage projects and other practices to minimize phosphorus runoff. He felt that a demonstration farms approach could complement their efforts.

Commissioner Galarneau (WI) supported expanding the phosphorus trading project in Wisconsin. He felt it is valuable to go through the preproposal process to explore the ideas, build partnerships, etc.

4) **Blue Accounting Implementation – Information Director Hire:** Eder noted that the Board discussed this about a year ago and approved moving ahead with plans to hire an Information Director/Chief Technology Officer, using reserve funds. Recent work with the Blue Accounting project and discussions with the Great Lakes Protection Fund further support this new position to enable the GLC to expand its work in this area. It would be a permanent hire, with up to two years of support from the GLC’s reserve funds, if needed. The aim is to hire someone with business experience,
which is essential to complement our policy and natural resource expertise. The Nature Conservancy is interested in the GLC’s Blue Accounting project and has a similar program related to information management. They have some support from the Dow Chemical Co., which has expertise that may serve to help advise the GLC as we develop and fill the position.

Acting Chair Burch invited a motion to approve the use of up to $320,000 in reserve funds to hire an information director. Motion was offered by J. Allan, Michigan, seconded by Todd Main, Illinois. There was no discussion and the motion was approved.

5) Deep Geologic Repository Request: Eder reviewed the proposed Deep Geologic Repository (DGR) proposed for Kinkardine, Ontario, noting that several entities are opposing the facility, and the Michigan State Senate has passed a resolution and legislation asking the GLC to assess and take a position on the DGR and established a review board that would include the GLC director. Eder has discussed this with the Senate sponsor and explained that the GLC does not have technical expertise to do a detailed assessment on the facility, and also includes associate membership from the Province of Ontario, which would be part of the GLC’s deliberations. Eder indicated that he likely would prepare a resolution on the issue supported by a background report to present for Board approval.

Commissioner Allan (MI) noted that any position the GLC takes would be directed to the State Senate, as the originator of the request, and not to the State of Michigan. The Administration is interested in the issue and has reviewed it. They have not identified any specific technical concerns with the proposal based on geology and related issues. He noted the circumstances of an outside entity requesting work from the GLC.

Associate Commissioner Carr (Ontario) noted that this is a sensitive issue in Ontario. After a recent election they have a new government and do not yet have a Minister of Energy in place yet. Civil servants cannot take positions on issues right now. This issue goes back to 2007 and there has been a comprehensive review and public consultations. If there will be further study, Ontario would want to know what the study process is; if the GLC has technical expertise and funding to support it; who the GLC would approach for information; and what questions would be addressed. How you approach the question can inflame the issue.

Eder noted that the GLC likely would review existing information, including that generated by Ontario and Ontario Power Generation, as well as other organizations. He noted U.S. EPA’s technical review. He did not recommend forming a formal task force, but could be open to that. He envisions close coordination with state delegations, particularly the State of Michigan and Province of Ontario, to consult with agency staff. A formal position, in response to the State Senate resolution, would likely take the form of a resolution that, by tradition, would be adopted by consensus. He noted that it is a bit unusual that this request is coming from outside of the GLC Board and members states. However, reviewing this issue is consistent with the GLC’s mission and mandate.

Associate Commissioner Carr asked about the relationship between any GLC study and a study prepared by the review board called for in the separate Michigan Senate legislation, which still must be adopted the State House. Eder responded that the board likely would include expertise and information that would inform the GLC’s work, but the GLC would not be bound by it.

Commissioner Allan stated that, given his relationship as an executive on loan from a utility that manages nuclear facilities, he will recuse himself from any GLC decisionmaking on this issue. He noted that the GLC would want to consider the process that has been undertaken in addition to the technical issues associated with the DGR. These are two very different things and would be addressed in a different way. Eder noted that the GLC is better suited to comment on the process vs. the technical merits.

Commissioner Tierney urged the GLC to consider where it can best add value on this issue. Where can we make a difference?
Commissioner Main (IL) asked if there is a timeline in the resolution related to the GLC’s work on this. Eder responded that there is not. He noted that there likely will be some form of interface with the State Department.

Eder recommended that the GLC prepare an outline and proposal for approaching this, including the overall approach and limits to the exploration of the issue, with a likely focus more on the process vs. technical issues. Staff would share this with the Board, which can consult with others within their agencies and state or provincial governments.

Acting Chair Burch concurred with this approach, with a focus on the process taken to date. Associate Commissioner Carr also concurred with this approach.

6) **Draft 5 Year Plan for the GLRI:** Eder noted that U.S. EPA provided a briefing for the states on the new GLRI Action Plan. Eder is not recommending that the GLC prepare formal comments on the new Action Plan. It is not dramatically different from the previous Action Plan and there are plenty of other demands facing the GLC staff at this time. Eder noted that the GLRI Regional Working Group is meeting in July and has invited discussion with the states on the GLRI. Commissioner Galarneau, a member of the Great Lakes Advisory Board (GLAB), offered to pass along any GLAB comments to the Board. Commissioner Zelazny noted that New York is concerned about an apparent reduced emphasis on beaches. Commissioner Galarneau noted concern about insufficient focus on the role of the LaMPs.

Eder suggested that the GLC wait until after the end of the review period and take note of state comments and consider the need to raise those with U.S. EPA.

7) **Chicago Waterways-Asian Carp Update:** Eder reviewed that there has been a problem finalizing arrangements for funding for the facilitators for this process, but that this has been resolved.

8) **Upcoming Meetings:**
   - July 16, 3:00 PM EST – Board call
   - Aug. 20, 3:00 PM EST – Board call
   - Sept. 17, 3:00 PM EST – Board call
   - Sept. 29-30 – Annual Meeting; Buffalo, NY

The meeting adjourned at 11:05 a.m.

Respectfully submitted,

Tim A. Eder
Executive Director

/md
The meeting was called to order at 3:02 p.m. EDT by Kelly Burch, interim chair. The following members were present:

- Todd Main - Illinois
- Roger Eberhardt (for Jon Allan) - Michigan
- Lt. Gov. Yvonne Prettner Solon - Minnesota
- Jim Tierney, Don Zelazny - New York
- Jim Zehringer, Mike Bailey, Karl Gebhardt - Ohio
- Trevor Snyder (for Bill Carr) - Ontario
- Kelly Burch - Pennsylvania
- Eric Marquis - Québec
- Steve Galarneau, Russ Rasmussen - Wisconsin

Staff present: Tim Eder, Tom Crane, Christine Manninen, Margaux Valenti.

1) **Introductions and call objectives:** Interim Chair Burch welcomed everyone to the call and Tim Eder reviewed the agenda.

2) **Minutes:** A motion to approve the minutes from the June 19, 2014, call was made by Commissioner Tierney (NY), seconded by Commissioner Prettner Solon (MN). The minutes were unanimously approved.

3) **Ballast water legislation letter:** Eder reported that a new piece of legislation, S. 2094, if passed, will make the U.S. Coast Guard ballast standard the law of the land, pre-empting any state standards. In the past the GLC has taken the position that the GLC wants to see a strong federal standard, however, we don’t want states to lose the right to increase the standard if they feel the federal standards do not adequately protect state waters (i.e., the GLC does not support state pre-emption). Also, there’s an issue of whether or not salt water flushing (i.e., ballast water exchange) should continue. The Canadians have suggested that salt water flushing adds to protection measures and should be retained. Eder expects S. 2094 will move forward in committee by end of July. Several states have suggested that the GLC generate a letter expressing its views on S. 2094. A draft letter was reviewed. The letter does not suggest there should be a consistent standard across the Great Lakes states so the GLC remains silent on this issue. Commissioner Tierney supported the letter, as drafted. Eberhardt also supported the letter and noted that speaking with a common voice as a region is a good move. Commissioner Burch noted that Pennsylvania also supports the letter, under his signature. Associate Commissioner Marquis noted that a consistent standard for the entire Great Lakes system is still the ultimate goal and remains a concern within the Quebec transportation community. Eder said that a task force has been working over the last six months to make progress on coming to consensus on a consistent standard. A uniform economic playing field is the ultimate goal. The board instructed Eder to move forward with finalizing and submitting the letter.

4) **Annual Meeting and resolutions:** Eder reported that the staff has been working with the New York Delegation to plan the 2014 Annual Meeting of the Great Lakes Commission. *Turning Rust to Blue:*
The Great Lakes Blue Economy is the theme of the meeting. Eder expressed his excitement over the meeting location since the State of New York has invested over a billion in revitalizing Buffalo. A tour of the Buffalo River Area of Concern and other waterfront revitalization projects will be held on the afternoon of Monday, Sept. 29, followed by an evening reception. The business meeting will be held 8 a.m.-4 p.m. on Tuesday, Sept. 30. EPA Administrator Gina McCarthy has been invited as a keynote speaker. Commissioner Tierney noted some of the many restoration achievements in the Buffalo area. He said that citing examples from other regions around the Great Lakes is encouraged. Tierney has invited Governor Cuomo to participate. Commissioner Zelazny said that what’s happening in Buffalo is very indicative of what is happening in other traditional “rust belt” cities in the region. Showcasing Buffalo will hopefully stimulate discussion about what else can be done with GLRI and other funds.

Eder presented one proposed resolution to be considered by the GLC in Buffalo: The need for greater flexibility in the application of the federal standard to operation and maintenance dredging projects in the Great Lakes basin. The draft resolution will not specifically mention some of the recent dredging issues in Cleveland, Ohio. Commissioner Galarneau, who serves as co-chair of the Great Lakes Dredging Team, said that it became clear through conversations with other states that the existing federal standard is not very flexible. It’s not about saying no to open water placement of dredged materials, but there are times when nearshore placement could be suitable. The rigid rules have made decisionmaking very challenging for many jurisdictions. Commissioner Gebhardt said the notion of how clean is clean (i.e., determining dredged material “quality”) might also be included in the resolution. Tom Crane said the GLC wants to look for opportunities to open dialogue and advance communication between the states and USACE. The region needs to start thinking more creatively about disposal options. Commissioner Main noted that USACE no longer feels compelled to comply to any of the State of Illinois’ authorities (sovereign immunity). The staff will draft the resolution. Eder said that a resolution pertaining to the Lake Ontario water level regulation plan might be considered, however, Commissioner Tierney noted that because there’s a gubernatorial election in New York this year, it would probably be tough to get a New York position on this issue.

Increased lakefront erosion is a big concern of many shoreline property owners. Eder invited ideas from the board for other resolution topics.

5) Oil transportation paper: Eder provided an update on a large-scale paper that the GLC is authoring: *Issues Surrounding the Transportation of Crude Oil in the Great Lakes-St. Lawrence River Region*. A discussion draft will be presented in Buffalo. The paper deals more with the transport of crude from oil fields outside the Great Lakes region (e.g., Bakken). A stakeholder engagement process will occur following the Buffalo meeting. An action item will request the Commission’s support in pursuing the stakeholder engagement process. Additional materials will be presented on the Aug. 20 Board call. Associate Commissioner Marquis visited the GLC and met with the project team on July 10 and reported that the paper is coming along very well. Commissioner Galarneau suggested that a brief write-up on who the authors/contributors are would be helpful, including staff, contractors and Commissioners. The GLC is also drafting a comprehensive glossary noting all the various sources that it’s using in its research.

6) Deep geological repository: Construction of a permanent nuclear waste disposal facility in Kincardine, Ontario, less than a mile from Lake Huron, is being proposed. The GLC has been asked by the State of Michigan to focus on the policy, process and procedures that the Canadian government is pursuing on this issue. The GLC is drafting a white paper, and Ontario Commissioners are being consulted.

7) Update on federal legislation: The GLC had a teleconference discussion with U.S. EPA officials, including Cam Davis, on July 15. Participating board members, including Commissioners Tierney and Galarneau, suggested that improved coordination with the states would be helpful in future
implementation of the Great Lakes Restoration Initiative. Making larger grants to the states and empowering the states to make more decisions was recommended. The aquatic invasive species state management plans were noted as an example. Federal officials said that states need to spend their monies in a timely manner in order to make it easier to feed more money to them.

Last week, Congress approved increased funding for USACE and dredging of harbors. The Interior and EPA Appropriations Subcommittee approved a bill allocating $300M for GLRI in FY2015. This was above the amount in the President’s budget. A Senate hearing is occurring on July 16 to discuss the Great Lakes Ecological and Economic Protection Act (GLEEPA). A hearing considering the Lacey Act amendments is also being held week of July 14. Letters in support of these bills are being sent by the GLC. A final budget isn’t expected anytime soon, however, appropriations are slowly being approved.

8) **Upcoming Meetings:**
   - Aug. 20, 3:00 PM EDT – Board call
   - Sept. 17, 3:00 PM EDT – Board call
   - Sept. 29-30 – Annual Meeting; Buffalo, NY

The meeting adjourned at 3:58 p.m.

Respectfully submitted,

Tim A. Eder  
Executive Director

/cm
The meeting was called to order at 3:00 p.m. EDT by Kelly Burch, interim chair. The following members were present:

- Todd Main - Illinois
- Jon Allan - Michigan
- Lt Governor Prettner-Solon - Minnesota
- Don Zelazny - New York
- Jim Zehring, Craig Butler, Mike Bailey, Karl Gebhardt - Ohio
- Bill Car, Trevor Snyder - Ontario
- Kelly Burch - Pennsylvania
- Eric Marquis - Québec
- Steve Galarneau - Wisconsin

Staff present: Tim Eder, Tom Crane, Victoria Pebbles, Matt Doss, Margaux Valenti, Michele Leduc-LaPierre.

1) **Introductions:** Interim Chair Burch welcomed everyone to the call and Tim Eder reviewed the attendance.

2) **Minutes:** A motion to approve the minutes from the July 16, 2014, call was made by Commissioner Allan (MI), and was seconded. The minutes were unanimously approved.

3) **Oil transportation paper:** Eder noted that members of the team that drafted the report are all GLC staff except Dr. Susan Christopherson and an intern under her supervision at Cornell University. Eder noted that the paper underscores the tremendous increase in movement of oil from western fields to east and south, especially via rail. The main body of the report will be about 15 pages, plus 4 supplementary issue briefs on individual topics. The paper would be presented as a discussion draft at the September 30 Buffalo Annual meeting. Subsequently, a 60-day period for review is proposed for detailed review by states, provinces, industry and environmental NGOs. GLC staff and Board would then develop any resolutions and action items in January and February in preparation for the Semiannual meeting. Tim proposed a call with the Board to review the paper on the 12th of September. The regular Board call would occur on September 17, during which the draft would be approved for inclusion in the briefing books. Briefing books are scheduled to go out on September 18 or 19. Tim clarified that Board review at this time should focus not on details but on reviewing and approving the paper as a discussion draft for detailed review by states and stakeholders.

J. Allan supported a stand-alone call on Sept. 12 and requested that other (non-Board) Commissioners be included. Tim clarified that a revised draft would be sent to the Board on Sept. 5. He further clarified that the issue briefs are in draft form but that he was not planning to send those to the Board unless requested. J. Allan indicated that he would like to see the issue brief drafts.

Tim requested approval by Board to present the draft action item at the Annual meeting, which would accept the receipt of the paper as a discussion draft and charge staff with seeking review and input by jurisdictions and stakeholders from October 1 through November 30. Motion to forward
for action item for consideration by the Commission in Buffalo by J. Zehringer (OH) second by D. Zelazny NY. Motion approved.

J. Allan asked for a cover memo summary that he could use to notify other Commissioners in the review process. Eder will send this to the Board for their use in preparing communications to other Commissioners in their states and provinces.

4) **Annual Meeting and Resolutions:** D. Zelazny expressed enthusiasm for upcoming meeting in Buffalo including a field trip the afternoon of Sept. 29 that will feature restoration and redevelopment efforts in the area that he hoped would inform discussions the next day. The following draft resolutions for consideration by Commissioners were discussed:

- **Dredging and Federal Standard:** T. Main requested perspective from Ohio and Wisconsin on whether there ought to be a link between open water disposal and algae blooms. The draft resolution is silent on the matter. Tom Crane indicated that the topic is controversial with the U.S. ACE, which is working on a report dealing with open water disposal and sediment resuspension. Tom noted that the scientific research GLC staff has seen is inconclusive at this point.

- J. Zehringer (OH) noted that K. Gephardt has been working with U.S. EPA on this issue. He further noted that $10 million has been set aside in Ohio DNR capital budget to eliminate open water disposal and find other ways to manage the dredged material. Gebhardt provided background on the $10 million and noted that it will be used to cover difference between the cost of open water placement (the least costly alternative per the “federal standard”) and beneficial use management options in Toledo and Cleveland.

  Eder suggested that the resolution might be modified to recognize that there are concerns over open water disposal and HABs and that it further make note that Ohio’s budget includes $10 million for alternatives to open lake disposal. Tim noted that the draft resolution would be modified accordingly and would be presented to the Board again on September 17.

- **GLRI Resolution:** Tim noted that if the federal agencies do not finalize the GLRI Action Plan prior to the GLC Annual Meeting, then the resolution would not be published in the briefing books. Steve G. noted that this would be discussed at the next meeting of the Great Lakes Advisory Board. Hearing no concerns or suggestions on the resolution, the decision on whether to present the resolution will be determined once the status of the GLRI Action Plan is clear.

- **Blue Accounting:** Tim summarized the impetus for this resolution and the request contained therein. There were no concerns or objections and the resolution will be included in the briefing book.

- **Nominating Committee:** K. Burch noted that T. Main and E. Marquis agreed to serve on a nominating committee and that J. Tierney would also be asked to serve.

5) **Toledo Water Crisis:** Eder noted the importance of GLC addressing this crisis at the Annual Meeting. Ohio EPA Director Craig Butler joined the call and provided an overview of how Ohio perceives this issue and proposed responses. He noted the outdated state of Toledo drinking water plant with few backup systems. U.S. EPA does not have a national standard for microcystis. There is a World Health Organization standard but it is based on a 20 year old study. Other states have a variety of standards. An action item calling for a microcystis standard was discussed. Tim noted that that was a good start, and noted that aging drinking water infrastructure is a separate problem that also deserves attention. C. Butler agreed.
There was further discussion about conservation practices and the uncertain funding to sustain them over the long term which complicates the ability of those practices to ensure they will provide water quality improvements. J. Allan raised question of whether there are contingency plans or whether there are needs to assess vulnerabilities in other drinking water supply systems across the basin.

Eder summarized overriding issues or concepts that could be incorporated into a resolution: a) call for a national microcystis standard, b) wise and sustainable use of nonpoint and Farm Bill funding, and c) contingency planning for drinking water infrastructure. K. Burch supported these and suggested including discussion of treatment technologies. There was further discussion about protocols and technologies and reference to such in the resolution. J. Zehringer offered Ohio’s assistance in developing a resolution. GLC staff will work with Lake Erie states to craft a resolution in advance of September 17 call.

6) **Motion to adjourn** by J. Allan, second by T. Main, approved. The meeting was adjourned at 4:20 PM.

7) **Upcoming Meetings:**
   - **Sept. 5, 10 AM EDT** – Call with Board and Commissioners re: oil transportation paper
   - **Sept. 17, 10:00 AM EDT** – Board call
   - **Sept. 29-30** – Annual Meeting; Buffalo, NY

Respectfully submitted,

Tim A. Eder
Executive Director
Action Items

- **Resolution – Lake Erie water pollution and drinking water crisis:** This resolution recognizes the recent contamination of drinking water supplies in the western Lake Erie region and the challenges associated with protecting drinking water and preventing algal blooms. The resolution calls on U.S. EPA and Environment Canada to establish national health advisory levels for cyanotoxins and an adaptive management framework for agricultural conservation programs. The Great Lakes Commission commits to forming a working group to address phosphorus reduction targets and other remedies. The resolution calls on Congress to fully fund the Drinking Water State Revolving Fund. It calls on federal agencies to assess biological-based controls such as Zequanox for managing invasive mussels.

- **Resolution – Flexibility in the federal standard for navigation dredging projects in the Great Lakes basin:** The resolution recognizes the current practice of the U.S. Army Corps of Engineers to apply a federal standard that often identifies open water placement as the preferred alternative for disposing of dredged material. It notes concerns that this practice may contribute to harmful algal blooms, and highlights alternatives involving beneficial uses of dredged material. The resolution encourages state and local governments to expand the demand for the beneficial use of dredged material to make such uses viable solutions. It urges the Corps of Engineers to consider the benefits of reusing clean sediment, and removing sediments and nutrients from the ecosystem.

- **Resolution – Establishing Blue Accounting: A collaborative re-engineering of Great Lakes information strategy and delivery:** This resolution directs the Commission to begin implementing recommendations from its recent report, *Great Lakes Blue Accounting: Empowering Decisions to Realize Regional Water Values*. It urges regional information providers to join the Commission in harmonizing the roles of data/information portals, and to begin a pilot Blue Accounting framework focused on municipal water services, including factors such as those that contributed to the Toledo water crisis. It calls for the open sharing of data to strengthen information systems and support effective decisionmaking.

- **Action Item – Presentation, review and process for finalizing the draft report on oil transportation:** This action item accepts the discussion draft summary report, requested at the Commission’s 2013 Annual Meeting, which evaluates the potential benefits, risks and mitigation options surrounding the transportation of crude oil in the Great Lakes-St. Lawrence River region. It directs Commission staff to publicize and solicit input on the information presented. Staff will consolidate input for future consideration by the Commission’s Board of Directors and Commissioners in formulating policy recommendations and next steps.
RESOLUTION – DRAFT

Lake Erie water pollution and drinking water crisis

Whereas, 36 million Canadian and U.S. citizens depend on the Great Lakes and St. Lawrence River for a multitude of benefits, including drinking water; and

Whereas, communities that depend on drinking water from the Great Lakes-St. Lawrence system are blessed with a bountiful supply of high quality water that usually exceeds standards for purity and cleanliness; and

Whereas, more than 400,000 residents of southeast Michigan and northwest Ohio were advised on Aug. 2-4, 2014, to avoid drinking and cooking with water supplied by the City of Toledo after local and state laboratories detected unsafe levels of microcystin, a toxin produced by a bloom of algae in western Lake Erie near the city’s drinking water intake; and

Whereas, the crisis that occurred in early August underscores problems and challenges that confront cities across coastal areas of the Great Lakes and St. Lawrence region and highlights needs and creates opportunities to identify and address sources of the problems in two areas – the ability of governments at all levels to detect, manage and treat contaminated drinking water and sources of pollution, and factors contributing to algal blooms; and

Whereas, state and local officials were forced to make decisions about the risks of microcystin in Toledo’s drinking water using only a World Health Organization (WHO) guideline of 1 microgram per liter because no federal standards exist and this WHO guideline is not based on recent studies; and

Whereas, the U.S federal government provides low interest loans to municipalities to finance investments in safe drinking water infrastructure through a state revolving loan program but these funds (less than $900 million in each of the last three years) are not sufficient to meet the $384 billion that the U.S. Environmental Protection Agency (U.S. EPA) estimates is needed through 2030 to improve drinking water infrastructure for nearly 300 million Americans; and

Whereas, additional guidance and assistance is needed to assist state, provincial and local governments in identifying effective techniques for treating drinking water supplies contaminated with toxins produced by algae and planning for and developing contingencies, including storage and alternative sources to avoid problems such those experienced in Toledo; and

Whereas, the State of Ohio has responded to the Toledo crisis with more than $150 million in grants and loans over the next year to help public water systems keep drinking water safe, improve their facilities and reduce the amount of phosphorus discharged into the Lake Erie watershed, and these funds include:

- $100 million in zero interest loans to local wastewater systems to help reduce phosphorus; and
- $50 million in zero-interest loans for local water plants for upgrades and backup water sources, including treatment for toxins produced by harmful algal blooms, as well as projects that implement avoidance strategies, such as interconnections with other water supplies, new elevated storage facilities and installation of alternative sources of water; and
- $1 million in grants of up to $10,000 per public water system to purchase equipment to test for the presence of microcystin and other cyanotoxins; and
Whereas, algae blooms in western Lake Erie, like blooms in other parts of the Great Lakes, are triggered by a variety of factors, including physical changes like warmer waters, more intense storms, changes in nutrient cycling through the food web associated with invasive mussels, and increased phosphorus pollution from a variety of sources, including point and nonpoint sources; and

Whereas, billions of dollars are being spent annually by state, federal and provincial governments to encourage farm practices that reduce erosion and improve nutrient management, including $9.5 billion over the last three years for U.S. Department of Agriculture conservation activities, yet many of these programs and practices can be of limited duration, are dependent on the sustainability of federal support, are subject to change based on prices of crops, and there is little information on the whether these programs and practices are targeted at the most important sources; and

Whereas, the International Joint Commission (IJC) and the State of Ohio’s Phosphorus Reduction Task Force have called for setting a load target at 800 metric tons (1,763,680 pounds) for total phosphorus and 150 metric tons for dissolved reactive phosphorus entering Lake Erie from the Maumee River in the spring (March-June), representing 37 percent and 41 percent reductions, respectively, compared to the average spring phosphorus loads between 2007 and 2012, while calling for similar reductions in phosphorus loads from other parts of the western Lake Erie basin; and

Whereas, the U.S. and Canadian federal governments are working under Annex 4 of the Great Lakes Water Quality Agreement to set phosphorus loading targets for Lake Erie by 2016; and

Whereas, loading targets should reflect the impact of invasive mussels on cycling and availability of nutrients, while new technologies, including biological-based agents such Zequanox, hold promise as possible agents to manage invasive mussels, and these agents require immediate testing on safety and efficacy; and

Whereas, states have the primary authority and responsibility for implementing clean water programs through delegation under the U.S. Clean Water Act, with Ontario executing clean water programs under its own authority and in cooperation with the Canadian federal government under the Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem.

Therefore, Be It Resolved, that the Great Lakes Commission calls on U.S. EPA and Environment Canada to work with the states of Michigan, Indiana and Ohio and the province of Ontario to take appropriate actions, following the recommendations of the IJC’s February 2014 Lake Erie Ecosystems Priority report and the Ohio Lake Erie Phosphorus Reduction Task Force Report of 2013, to protect water quality in Lake Erie, with a focus on the western basin; and

Be It Further Resolved, that state and provincial members of the Great Lakes Commission are committed to protecting Lake Erie and will work together and with federal agencies, municipal officials and landowners to reduce water pollution and assist local municipalities in providing safe drinking water; and

Be It Further Resolved, that the members of the Great Lakes Commission commit to forming a working group to:
• develop new and refine existing practices, programs and policies necessary to achieve pollutant reduction targets or remedies as might be identified by the working group and to achieve objectives set forth in the U.S. Clean Water Act and the Great Lakes Water Quality Agreement; and
• explore and advance market-based and other cost-effective incentive programs to complement regulatory and non-regulatory approaches to strengthen the effectiveness and sustainability of the overall management regime for improving water quality and safeguarding drinking water in Lake Erie; and

Presented for consideration at the 2014 Annual Meeting of the Great Lakes Commission, Sept. 30 in Buffalo, N.Y.
Be It Further Resolved, the Great Lakes Commission urges federal agencies to work with states, provinces, local municipalities, landowners and technical experts to develop and implement an adaptive management framework for agricultural conservation and water quality protection programs that monitors and evaluates the performance of voluntary and regulatory conservation practices and facilitates improvements to strengthen their effectiveness and sustainability; and

Be It Further Resolved, the Great Lakes Commission calls on U.S. EPA and Environment Canada to jointly develop and establish national health advisory levels for microcystin and other cyanotoxins, including advisory levels for acute and short-term exposure risks with tiered levels for more susceptible populations such as children and infants; and

Be It Further Resolved, the Great Lakes Commission calls on Congress to fully fund the Drinking Water State Revolving Fund and that federal governments in both the United States and Canada should provide funding to support the planning, design and construction of needed infrastructure improvements to treat and or avoid cyanotoxins; and

Be It Further Resolved, the Great Lakes Commission urges federal agencies to work in collaboration with the Great Lakes Commission and state, provincial, municipal officials and other experts to:

- Identify more precisely the drinking water infrastructure investment status and needs for cities in Great Lakes states and provinces and share this information with decisionmakers to encourage increased funding;
- Identify and share information on techniques and practices to assist local governments in detecting, monitoring and reporting toxins related to algae;
- Identify and share information on practices to effectively treat drinking water contaminated with cyanobacteria; and
- Identify and share information on options to provide redundancy and contingencies in water supply; and

Be It Finally Resolved, the Great Lakes Commission calls on federal agencies, including the Department of Fisheries and Oceans Canada, the U.S. Geological Survey and the National Oceanic and Atmospheric Administration, to collaborate with states, provinces, the Great Lakes Commission and the Great Lakes Fishery Commission to develop protocols for testing and supporting investigations and field trials on the efficacy and safety of biological-based controls such as Zequanox for the management of zebra and quagga mussels.
RESOLUTION – DRAFT

Flexibility in the federal standard for navigation dredging projects in the Great Lakes basin

Whereas, dredging is vital to ensure safe navigation for shippers engaged in maritime commerce and recreational boaters who utilize ports, harbors and shipping channels in the Great Lakes and the St. Lawrence River; and

Whereas, low water levels over the past decade have increased the need for dredging; and

Whereas, increased dredging requires the Great Lakes states and the U.S. Army Corps of Engineers (USACE) to work together to plan for the disposal of dredged material in a manner that addresses both economic and environmental protection priorities; and

Whereas, to make decisions on how to administer funds for dredging projects, the USACE identifies and applies an economic feasibility determination known as the “federal standard”; and

Whereas, the federal standard is defined as the disposal placement alternative (or alternatives) identified by USACE that is the least costly, complies with feasible engineering practices, and satisfies federal permitting and state certification standards under Clean Water Act; and

Whereas, open water placement of dredged material is often identified as the preferred alternative under the federal standard, despite the preferences of states and local stakeholders for upland management options, including beneficial use, and;

Whereas, concern over the potential connection between re-suspension of nutrients during open water placement of dredged material and harmful algal blooms (HABs) is increasing; and

Whereas, cleanup of Areas of Concern and elimination of pollution has resulted in cleaner sediment allowing dredged material to be used for beneficial purposes such as habitat restoration and creation, beach nourishment, aquaculture, forestry, agriculture, mine reclamation, construction fill and Brownfield redevelopment; and

Whereas, under Public Law 94-587, Section 148, the USACE is asked to consider recycling of dredged material as an alternative to constructing new confined disposal facilities (CDF) to store dredged material; and

Whereas, Sec. 209 of WRDA (1999), authorizes the USACE to carry out projects for creating, protecting and restoring habitats at a 75 percent federal cost share with states or local entities, such as port authorities, but the federal standard determination, as it is currently applied, does not consider other environmental benefits such as the benefit of preventing disposal of dredged material and associated nutrients from the open waters of the lakes or placing dredged material in some shallow nearshore zones; and

Whereas, the State of Ohio has allocated $10 million from its capital appropriation budget to be used for developing a program to promote beneficial use of dredged material as an alternative to open lake placement; and
Whereas, the USACE can select a disposal or placement method that is not the federal standard in order to achieve environmental benefits only with specific congressional appropriation, at a 75 percent federal cost share with the states; and

Whereas, assigning value to all options under the federal standard would broaden the number of beneficial uses qualifying for funding, which would provide greater social, economical and environmental benefits.

Therefore, Be It Resolved, that states and local governments are encouraged to identify, develop and expand the demand for the beneficial use of dredged material from Great Lakes harbors in order to make beneficial use a viable and cost-effective solution; and

Be It Finally Resolved, that the USACE should provide greater latitude and flexibility in interpreting and applying this federal standard in order to fully consider the social, economic and environmental benefits of reusing clean sediment, the added benefits of removing sediments and nutrients from the aquatic ecosystem, and utilizing beneficial use opportunities to reduce open water placement of dredge material, where appropriate.
Establishing *Blue Accounting*: A collaborative re-engineering of Great Lakes information strategy and delivery

**Whereas**, the water resources of the Great Lakes region support a vibrant economy, exceptional ecosystem and rich quality of life; and

**Whereas**, for the region to continue to realize its competitive edge in North America and globally, the true value of water must be realized – and then sustained – through strategic investments to achieve priority water resource outcomes; and

**Whereas**, strategic development and delivery of information and knowledge will play a key role in our understanding and claiming of regional water values; and

**Whereas**, for decades we have monitored aspects of the Great Lakes water system itself (stream flow, and stream and lake water quality) but we do not have a coordinated system of data, information and knowledge to support decisions; and

**Whereas**, critical concepts and technologies supporting the linkage between information systems and decisionmaking across large regions have also been developing in the Great Lakes region, including the Great Lakes Aquatic Habitat Framework, Great Lakes Observing System and the Great Lakes Information Management and Delivery System; and

**Whereas**, better accounting of our municipal water resources could have provided vital information to anticipate or prevent and, subsequently, assist with response efforts related to the recent drinking water crisis in Toledo, Ohio (Aug. 2-4, 2014) caused by the toxin microcystin breaching water intakes due to the persistence of harmful algal blooms in western Lake Erie; and

**Whereas**, the Great Lakes Commission is charged by the region’s governors and premiers to “promote the orderly, integrated, and comprehensive development, use and conservation of the water resources of the Great Lakes basin” and created and manages the Great Lakes Information Network, the only online clearinghouse of its kind serving the region; and

**Whereas**, in 2013 the Great Lakes governors and premier of Ontario charged the Great Lakes Commission to provide recommendations on a comprehensive and effective vision for regional water monitoring and reporting; and

**Whereas**, with guidance from a collaborative workgroup, the Great Lakes Commission provided this vision in the report, *Great Lakes Blue Accounting: Empowering Decisions to Realize Regional Water Values*, in March 2014; and

**Whereas**, the Blue Accounting report lays out a strategy for revolutionizing the way information about water resources is designed, organized, managed, delivered, financed and governed in the Great Lakes region; and
Whereas, the Blue Accounting vision provides a tactical opportunity to re-engineer GLIN, both strategically and structurally, and enhance its capacity as the information hub for the entire Great Lakes community; and

Whereas, the governors and premiers provided enthusiastic feedback to the Blue Accounting plan in April 2014 and encouraged the Great Lakes Commission and its collaborators to move forward with its implementation.

Therefore, Be ItResolved, the Great Lakes Commission will collaborate with partners to begin refining and implementing the Blue Accounting framework including acquiring additional resources in-house and with partners; and

Be it FurtherResolved, the Great Lakes Commission will help to catalyze implementation of the Blue Accounting initiative, redesign of GLIN, and establishment of a progressive framework for greatly improved orderly, integrated and comprehensive information systems in support of basin-level water resources management; and

Be It FurtherResolved, the Great Lakes Commission calls on regional information providers to join with the Commission in helping to clarify and harmonize the roles of the primary, regional data/information portals; and

Be It FurtherResolved, the Great Lakes Commission urges partners to work collaboratively to begin a pilot of the Blue Accounting framework around municipal water services (safe drinking water, runoff and waste treatment) and that factors leading to the Toledo water crisis be used to guide planning in the development of the pilot; and

Be it FinallyResolved, the Great Lakes Commission calls on regional collaborators and funders to help by openly sharing data in order to lead to smarter information systems and knowledge to support decisions by individuals, governments and corporations to correct mistakes, prevent future problems, and maximize the environmental, economic and social benefits that our water resources provide.

Presented for consideration at the 2014 Annual Meeting of the Great Lakes Commission, Sept. 30 in Buffalo, N.Y.
Presentation, review and process for finalizing the draft report on oil transportation

Background: At its September 2013 annual meeting the Great Lakes Commission adopted an action item directing staff to prepare an issue brief evaluating the potential benefits, risks and mitigation options surrounding the transportation of crude oil in the Great Lakes-St. Lawrence River region, including an assessment of the regulatory structure in the two countries, and states and provinces. Staff was instructed to consult with the Commission’s Emergency Preparedness Task Force and Economic Committee, as well as stakeholders and government agencies in the areas of environmental assessment, water policy, hazardous materials transport and management, economic development and commercial interests.

The September 2013 action item noted that the development of domestic crude oil in both the United States and Canada has become an important part of energy policy in the two countries, and has created economic opportunities for oil companies, transportation interests and local communities where oil is extracted or shipped for refinement and export, as well as consumers. The Bakken oil formation, covering parts of two provinces and two states in the Great Plains, and the Athabasca Oil Sands formation in Alberta are two major areas of oil exploration and export.

In the Great Lakes-St. Lawrence River region increased transportation of crude oil has created new challenges and problems. The most noteworthy was the July 2013 accident in Lac Mégantic, Québec, involving a train transporting crude oil from the Bakken oil reserves for refinement in New Brunswick that killed 47 people. This tragic event, along with the July 2010 oil pipeline rupture in Marshall, Mich., and other less-publicized incidents, has created a need for the Great Lakes-St. Lawrence River region to better understand the extent and nature of safety issues surrounding the transportation of crude oil from the west by all modes including rail, vessel and pipeline.

Although interprovincial, interstate and international crude oil transportation falls under federal jurisdiction in Canada and the United States, tragedies such as Lac Mégantic remind us that state and provincial governments will be greatly solicited by their population whenever such an accident occurs, and that the prevention of these accidents involves state and provincial jurisdictions.

Commission staff have completed the issue brief as a “discussion draft” (with four accompanying “mini briefs”) and presented it to the Commission for its information and review. Given the complex and dynamic nature of this issue, input from the Great Lakes states and provinces, and a wide range of interested or affected stakeholders, is vital to ensure the full range of issues are considered, and a credible suite of findings and next steps are put forth to inform possible future actions. Thus, this action item provides guidance for Commission staff on a process for securing input on the discussion draft and finalizing it prior to the Commission’s 2015 semiannual meeting.

Action: The Great Lakes Commission accepts the discussion draft evaluating the potential benefits, risks and mitigation options surrounding the transportation of crude oil in the Great Lakes-St. Lawrence River region, including an assessment of the regulatory structure in the two countries, and states and provinces. The Commission accepts this draft acknowledging that it will require an opportunity for review by its member jurisdictions as well as the broad array of governmental agencies, business and industry, and nongovernmental stakeholders involved in or concerned about the transportation of crude oil in the Great Lakes and St. Lawrence River region. As such, the Commission staff is directed to publicize and make the discussion draft widely available to its Economic Committee, its Emergency Preparedness Task Force and other interested parties, and to actively solicit input on the information.
presented to ensure a credible and accurate evaluation of relevant issues and to identify next steps to inform future work by the Commission and possible actions by the Great Lakes-St. Lawrence River states and provinces. Staff will consolidate input of the stakeholder review process for consideration by the Commission’s board, and with the board’s input will revise and finalize the issue brief prior to the Commission’s 2015 semiannual meeting.
Memorandum

To: Great Lakes Commissioners, Associate Commissioners, Alternate Commissioners and Observers

From: Tim Eder, Executive Director

Date: September 18, 2014

Re: Presentation of Oil Transportation Summary Paper – Discussion Draft

At its 2013 Annual Meeting in Milwaukee, the Great Lakes Commission approved an Action Item directing staff to prepare an overview of crude oil transportation in the Great Lakes-St. Lawrence River region. In response, a summary report is presented here, and four individual issue briefs are available that provide more detailed information in the following areas: 1) developments in crude oil extraction and movement; 2) advantages, disadvantages and economic benefits associated with oil transportation; 3) risks and impacts associated with crude oil transportation; and 4) policies, programs and regulations governing the movement of crude oil.

The summary report is presented at the 2014 Annual Meeting as a discussion draft. Great Lakes Commissioners will consider an Action Item at the meeting that initiates a 60-day review period for member states and provinces and other stakeholders to provide comments on the draft. Following the receipt of comments, Commission staff will work with the Board of Directors to finalize the report and develop recommendations for consideration at the 2015 Semiannual Meeting in late February.

Comments are welcome on all aspects of crude oil transportation issues addressed in the papers. Reviewers are invited to consider the following questions:

1. Are the major issues and findings surrounding crude oil transportation in the Great Lakes-St. Lawrence River region properly addressed?
2. Is there additional information that would support, supplement or refute the findings?
3. Is additional information needed regarding the safe and efficient transportation of crude oil?
4. Will the report’s findings support the development of policy recommendations to be considered by the Commission?

The deadline for submitting comments, pending approval by Commissioners, will be December 1, 2014.

The website for accessing the reports is: https://www.glc.org/oiltransport/comments.php

Reviewers experiencing technical difficulties can contact the Commission staff at oilcomments@glc.org.
Summary of
Issues and Trends Surrounding the Movement of Crude Oil in the Great Lakes-St. Lawrence River Region

Background
The development of domestic crude oil in both the United States and Canada has become an important part of the energy policy in the two countries. As one element of a plan to reduce the dependence on imported oil, the development of domestic oil reserves is creating economic opportunities for oil companies, transportation sectors, for local communities where oil is extracted, refined and exported and all of the segments of society that benefit from less expensive and more secure oil supplies. Development of the Bakken oil formation, covering parts of two provinces and two states in the Great Plains, and the oil sands reserves in Alberta represent two of the biggest oil formations in North America. Development of these oil reserves have caused an economic boom in some areas reducing unemployment and contributing to budget surpluses for local communities and even entire states. However, the rapid development of the Bakken oil reserves and the Alberta oil sands have created challenges in the oil fields related to protection of water supplies, the need to maintain and upgrade infrastructure, and enhance government services, among others. The transportation of oil creates additional challenges and poses risks to the Great Lakes-St. Lawrence River region, which this paper and accompanying issue briefs address.

Oil production is an important source of energy, employment, and government revenue in the U.S. and Canada. In recent years, domestic production of crude oil in the North America (primarily from the Bakken formation, the Alberta oil sands and the Permian and Eagle Ford fields in Texas) has increased at a tremendous rate. This increased production is predicted to continue into the future, creating significant challenges in transporting crude oil to domestic markets, especially to refineries. The rapid expansion of crude oil production to date has been striking: in the U.S., total production reached 7.4 million barrels per day (bbl/d) in 2013, up from 5.35 million bbl/d in 2009 – an increase of 38.5 percent\(^1\). The forecasted output for 2015 represents what will be the highest level of domestic production in the U.S. since 1972: 9.3 million bbl/d, a 75 percent increase over 2009 levels.\(^2\)

The Great Lakes, their connecting channels and the St. Lawrence River represent the largest system of freshwater resources in the world. The Great Lakes have a total water surface area of nearly 95,000 square miles. They contain approximately 24.6 quadrillion liters of water (6.5 quadrillion gallons) which is 20 percent of the world’s supply of fresh surface water and 95 percent of the fresh surface water in the United States. Thousands of streams and rivers drain the more than 521,000 square kilometers (201,000 square miles) of the basin and feed directly into the Great Lakes.

Along with the St. Lawrence River, the Great Lakes have played and continue to exert a profound influence in the establishment, advancement and sustainment of the regional and national economies of the U.S. and Canada. The unique geographical, ecological and climatological characteristics of the Great Lakes and the land area making up the drainage basin have shaped the socio-economic heritage of the region. For many generations the Great Lakes and the St. Lawrence River region has been a desired place for people to live, work and educate their children and an equally attractive place for many businesses and industries.

There are more than 36 million people (approximately 8% of the U.S. population and 32% of the Canadian population) who depend on the Great Lakes for their drinking water supply. Key industries, such as agriculture, power generation, tourism, and sport and commercial fishing are prominent in the region. In addition to service and resource-based industries, manufacturing industries in the Great Lakes region include steel, paper, chemicals and
automobiles. These industries rely both on oil for their operations and Great Lakes basin water for their processes. Moreover, the Great Lakes region is home to pristine natural environments and ecologically sensitive areas.

The Great Lakes-St. Lawrence River region is particularly dependent on petroleum products because of the makeup of the regional industry and business mix. However, the geography of the region, which contributes to its uniqueness, presents some challenges with regard to the transportation of oil that powers region’s industries, businesses and homes. The Great Lakes themselves form a bottleneck or “water block” to the movement of oil. It would be impractical and risky to build a network of pipelines under the lakes, and transportation routes via land face logistical and geographical hurdles. Rail transport for instance includes routes that traverse both pristine, unpopulated areas and major metropolitan centers such as Chicago, Milwaukee, Detroit, Buffalo and Toronto.

While the region’s economy is dependent on oil, it is equally dependent on water. The region is blessed with a globally unique, water-rich natural environment. The abundance of high-quality fresh water is an important reason that business and industry have chosen to locate here. The Great Lakes and St. Lawrence River support a huge international economy and marketplace that includes a large and growing sector for global trade, commerce and exchange of people, ideas and technologies. One of the biggest challenges is to identify growth-oriented, water-dependent industries (e.g., the “Blue Economy”) to contribute to a more balanced regional economy supporting healthy service, financial and tourism/recreation sectors, among others.

Since the future economy will continue to rely on oil and petroleum products, the challenge for the region is to acknowledge, appreciate and support contributions of the oil industry to society and the economy, but to also properly understand the risks associated with oil transportation to the region.

The acceleration in crude oil production has challenged both industry and government to address the growing need to transport crude oil efficiently, safely and economically from the oil fields to refineries and points of export in both nations. Crude oil transportation modes include pipelines (the traditional preferred mode of transporting petroleum products by the oil industry) and oceangoing tankers, but increasingly producers are turning to rail transport and other methods to transport crude oil as a result of capacity bottlenecks in the pipeline network.

Oil and oil products have played an important role in the development of the U.S. and Canada and oil still plays a predominate role in the energy mix of the two countries. Oil (together with natural gas) benefits our lives in countless ways every day. Together, they supply more than 60 percent of the energy needs in the U.S., fueling our cars, heating our homes and cooking our food. Oil (and natural gas) also helps generate the electricity that powers the two countries. Crude oil also supplies the building blocks for countless everyday products, including dent-resistant car fenders, soft drink bottles and camping equipment. The benefits of oil are significant and far reaching in many ways that we would rarely think of. For instance, oil is used in the development of products such as synthetic fabrics, pharmaceuticals, fertilizers, sporting goods and toys.
The oil and natural gas industry is one of the world’s largest industries and oil plays a vital role in supporting the North American economy. Annual revenues are large as are the costs of providing consumers with the energy they need. Among those costs are finding and producing oil and natural gas; and refining, distributing and marketing those refined products. The energy Americans and Canadians consume today is made possible by investments made years or even decades ago by the oil industry. And much of the oil industry earnings are invested in new technologies, new production, improvements in environmental protection and product quality in order to meet tomorrow’s energy needs.

While the economies and societies of Canada and the U.S. partake of the many benefits of oil, the two countries are challenged with significant emerging issues and recent problems surrounding the transportation of domestic crude oil. The Great Lakes-St. Lawrence River region faces these challenges as well. The binational Great Lakes region, home to eight U.S. states, two Canadian provinces, and a number of tribal governments, has become a hub of oil transportation and refining activity within the two nations. The Great Lakes-St. Lawrence River region is a leading center of business and manufacturing for the two countries. The lakes themselves provide an efficient means of transportation of goods and materials for the region and the rest of the world. The economic vitality of the region relies heavily on the petroleum and petrochemical industry, including production, storage and transportation components.

The petroleum industry in the region is a coordinated network of refineries, pipelines, terminals, barges and vessels. This network operates 24 hours per day, 365 days per year to meet the energy needs and demands of the region’s residential, industrial and commercial customers. For instance, Ontario’s Chemical Valley located south of Sarnia is one of the world’s leading production centers for petrochemicals. One of the largest refineries in the U.S. is located on the shores of Lake Michigan in Whiting, Indiana.

Six American and six Canadian refineries operate in the Great Lakes drainage basin and there are 25 refineries operating in the eight-state, two-province region. These facilities combined refine nearly five million bbl/d of crude oil. While these refineries represent destination points within the region, the region is also experiencing challenges due to the large amount of domestic crude oil being transported through the region (primarily via rail tankers and pipelines) to refineries and other destination points outside of the region.

The importance of issues surrounding the safety of oil transportation through the region was tragically brought to attention on July 6, 2013 when a train carrying numerous tank cars of domestic crude oil derailed in the town of Lac-Mégantic, Québec. The derailment resulted in a devastating explosion causing the loss of 47 lives, billions of dollars of damage to the town and an oil spill in the Chaudière River, the main source of drinking water for thousands of downstream citizens. This calamitous accident served to underscore deep concerns that many officials and decisionmakers in both the U.S. and Canada were beginning to have about the potential negative impacts of increased oil transportation both in the Great Lakes-St. Lawrence River region and throughout the two countries.

Nearly twenty-five years earlier the two countries received a serious wakeup call regarding the devastation that can occur from transporting oil via vessel. In March 1989, the *Exxon-Valdez* was grounded on a reef and began leaking millions of gallons of oil into the pristine waters of Prince William Sound, Alaska. This incident, which received worldwide attention, precipitated the development and passage of several key pieces of environmental protection legislation in both the U.S. and Canada, most notably the Oil Pollution Act (OPA) of 1990.

In July 2010 another headline-making oil spill occurred in the Great Lakes-St. Lawrence River region when a pipeline carrying diluted bitumen, a heavy crude oil from the Alberta oil sands, spilled into Talmadge Creek, a tributary of the Kalamazoo River, near Marshall, Mich. Approximately one million gallons of oil was spilled, resulting in one of the largest inland spills and cleanups in U.S. history. This spill generated regional and binational interest regarding issues surrounding transportation of oil via pipeline, the age of the infrastructure and the need to review and evaluate the programmatic and regulatory framework to ensure that the transportation of oil via this mode is safe and efficient.
Similarly, the Lac-Mégantic incident has brought to light the need for the programmatic and regulatory regimes governing the transportation of oil via rail in both countries to be evaluated, and possibly revised and enhanced to keep pace with the rapid increase in transportation of oil via this mode from the western oil fields of the two countries.

Since the Lac-Mégantic incident at least 19 other transportation-related crude oil spills have been reported in the news from both the U.S. and Canada involving all modes of transportation, including rail (eight incidents), pipeline (eight incidents), vessel/barge (two incidents) and truck (at least one incident). At least four of these spills occurred in a Great Lakes state or province.6

Table 1: Accidents resulting in oil spills since the Lac-Mégantic accident on July 6, 20136 (spills in Great Lakes states are shaded)

<table>
<thead>
<tr>
<th>Date</th>
<th>Mode of transportation</th>
<th>Location</th>
<th>Amount spilled (gallons)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/13/2013</td>
<td>Pipeline</td>
<td>Erie, IL</td>
<td>unknown</td>
</tr>
<tr>
<td>9/29/2013</td>
<td>Pipeline</td>
<td>North Dakota</td>
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<tr>
<td>10/19/2013</td>
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<td>Gainford, AB</td>
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<td>Rail</td>
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<td>2,730,000</td>
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<tr>
<td>12/30/2013</td>
<td>Rail</td>
<td>Casselton, ND</td>
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<tr>
<td>1/7/2014</td>
<td>Rail</td>
<td>Plaster Rock, NB</td>
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</tr>
<tr>
<td>1/18/2014</td>
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<td>between Red Wing and Winona, MN</td>
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</tr>
<tr>
<td>2/13/2014</td>
<td>Rail</td>
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<td>10,000</td>
</tr>
<tr>
<td>2/24/2014</td>
<td>Barge/Tanker</td>
<td>Vacherie, LA</td>
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</tr>
<tr>
<td>3/19/2014</td>
<td>Pipeline</td>
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<td>10,000</td>
</tr>
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<td>3/22/2014</td>
<td>Barge/Tanker</td>
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<td>4/30/2014</td>
<td>Rail</td>
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<td>5/10/2014</td>
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<td>7,930</td>
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<td>Pipeline</td>
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<td>Pipeline</td>
<td>Delta National Wildlife Refuge, LA</td>
<td>2,100</td>
</tr>
<tr>
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<td>Pipeline</td>
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<td>25,000</td>
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<tr>
<td>6/7/2014</td>
<td>Pipeline</td>
<td>New Town, ND</td>
<td>29,000</td>
</tr>
<tr>
<td>6/11/2014</td>
<td>Truck</td>
<td>St. George, UT</td>
<td>4,000</td>
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</tbody>
</table>

*Amount of initial spill. Amount recovered not considered
# Only accidents with spills of more than 1,000 gallons were compiled. Accidents in storage and processing facilities are not included

Purpose of the Report

Concerns over these recent spills, coupled with the need for information regarding the dramatic increase in domestic oil production and the commensurate increase in oil transportation (especially by rail) to and through the Great Lakes-St. Lawrence River region prompted the Great Lakes Commission, at its 2013 Annual Meeting, to instruct its staff to prepare an issue brief on oil transportation. Because of the scope of the issue, staff has prepared a series of four background briefing papers to report on the potential benefits, risks and options for mitigating risks surrounding the transportation of crude oil in the Great Lakes-St. Lawrence River region, including an assessment of the regulatory structure in the two countries and the states and provinces. At the 2013 annual meeting the Commissioners expressed their interest in better understanding both the positive benefits of oil production and transportation but also the risks and impacts to the region’s citizens and environment, and to consider ways these risks and impacts can be reduced and minimized to protect the Great Lakes and St. Lawrence River ecosystem.

This summary is accompanied by the four supporting issue briefs, which together are presented here as a discussion draft. During the fall of 2014, these discussion drafts will be available for review and comment by the Great Lakes Commissioners, the states and provinces, federal, state/provincial and local governmental agencies from the U.S. and Canada, business and industry, and nongovernmental stakeholders involved in or concerned about the transportation of crude oil in the Great Lakes and St. Lawrence River region. The final report will be presented to the Great Lakes Commission at its 2015 semiannual meeting in late February and will include observations, key findings and potential next steps to guide the work of the Commission on this important issue.
The Great Lakes Commission is an interstate compact agency that promotes the orderly, integrated and comprehensive development, use and conservation of the water and related natural resources of the Great Lakes basin and St. Lawrence River. Its members include the eight Great Lakes states, with associate member status for the Canadian provinces of Ontario and Québec. The Commission was established by joint legislative action of the Great Lakes states in 1955 (the Great Lakes Basin Compact) and granted congressional consent in 1968. A Declaration of Partnership established associate membership for the provinces in 1999.

The Commission’s mission is to help its member jurisdictions speak with a unified voice and collectively fulfill their vision for a healthy, vibrant Great Lakes-St. Lawrence River region. Commission products and services focus on communication and education, information integration and reporting, facilitation and consensus building, and policy coordination and advocacy.

The Commission has a longstanding interest in emergency preparedness and response and oil transportation issues, dating back to the mid-1980s. The Commission formed an emergency preparedness task force in 1989 to help develop policy recommendations for the region in the aftermath of the Exxon Valdez incident. The work of the Commission and its task force (which remained in place until 1996) contributed to the passage of two important pieces of environmental legislation in 1990; the Oil Pollution Act and the Great Lakes Critical Programs Act, which strengthened both regional and national preparedness and response frameworks related to oil spills. For the past 25 years the Commission has worked with the U.S. Environmental Protection Agency and its Region 5 Regional Response Team to advance area contingency planning efforts through the creation of inland area maps and other tools that support spill planning and response in the field. In the 1990s, the Commission and the Council of Great Lakes Governors (with support from the Great Lakes Protection Fund) created the Great Lakes Spill Protection Initiative, a partnership between state and federal agencies and the region’s major oil companies that helped build and strengthen government-industry collaboration and coordination mandated under OPA. And in 2010, the Commission established a second emergency preparedness task force in the wake of the Enbridge pipeline spill that occurred outside of Marshall, Mich. in July of that year. The task force report, presented to the Great Lakes Commissioners in September 2012, detailed nearly two dozen policy recommendations to help strengthen federal, state and provincial preparedness and response programs in areas related to cold-weather response, vessel-based spills, shoreline facility-based spills and pipeline spills.

The 2013 action item is a continuation of the Commission’s interest in preparedness and response activities related to oil and is an acknowledgement that there is a need for managers and decisionmakers in both the public and private sectors to better understand the complex nature of oil extraction, transportation and refinement from economic, societal, environmental and public health perspectives.

Developments and Responses from Regional Partners to Recent Oil Spills

Government agencies, nongovernmental environmental and citizens groups as well as the oil industry itself have shown a strong interest in raising awareness to help policymakers better understand the challenges and constraints faced by the industry to move crude oil from the point of extraction to final destination points.

Within the Great Lakes-St. Lawrence River region recent studies and reports completed by state, provincial and federal agencies and citizen environmental groups were written to address the risks associated with transporting crude oil. For instance, in April 2014, a multi-agency report was issued by the State of New York on transporting crude oil with a series of recommendations to reduce risks and improve response capacity directed toward the state, the federal government and industry.

Updating programs and policies in the Great Lakes-St. Lawrence River region is also rapidly progressing with state/provincial elected officials and agencies implementing more rules, regulations and policy briefs at regular intervals. A few examples from the region include: the Michigan Attorney General and Department of Environmental Quality Director are convening a taskforce to study petroleum pipeline safety throughout the state as well as the state’s preparedness for spills; the Governor of New York State issued an Executive Order in January 2014 to various state agencies directing them to petition U.S. DOT to strengthen rail car standards, and to assess
federal agencies needs and risks associated with the transport of crude oil. Minnesota has been exploring ways to enhance its emergency response system, highlighting the importance of lessening the volatility of Bakken crude oil transported by rail.

These recently published reports (and new initiatives) were prompted to a large extent by recent spills or by concerns related to proposals to transport more oil through the region. A brief summary of these issues by transport mode is included below.

**Pipelines**

Pipelines are the traditional preferred mode of transportation for petroleum products. A pipeline transports oil by a series of pumping stations situated at various intervals along each route using remotely controlled valves. More oil is transported through the Great Lakes-St. Lawrence River basin by pipeline than by any other mode. To ensure safety of transport, pipeline companies operate control centers. These centers, staffed 24 hours per day, monitor data from information points located along the pipeline system to check for leaks and spills. Leak detection is provided by volume in/volume out readings of product flow through a given length of pipeline. These volumes are regularly compared and if they are not within prescribed limits, the pipeline is shut down and inspected by the company. In addition to these pipeline monitoring practices, pipeline routes are visually inspected on a regular basis.

There has been renewed awareness of the issue of pipeline safety and the need to better understand the issues surrounding the transport of oil through pipelines as a result of two spills that occurred in the Great Lakes region in the summer of 2010: one mentioned above that occurred near Marshall, Mich. and the other that occurred in September of that year in Romeoville, Ill. These pipeline incidents captured public and regulatory agency interest and have drawn attention to the vulnerability of the Great Lakes basin from pipeline spills. These spills have also prompted preparedness and response agencies to evaluate the state of preparedness within their agency/jurisdiction and to begin the process of identifying areas where these programs can be improved.

In 2012 the National Wildlife Federation completed a legal analysis of pipelines and issued a report titled *After the Marshall Spill: Oil Pipelines in the Great Lakes.* The report examined whether laws and regulations governing pipelines adequately protect the Great Lakes Basin from oil pollution. The report concluded that federal laws are inadequate in many respects related to planning, inspection, maintenance, enforcement, risk management and communications, among others. The report also notes that the states themselves have not passed their own laws to fill regulatory gaps. For instance, within the Great Lakes region, only a few states have chosen to regulate the safety and environmental impacts of oil pipelines. Michigan, Minnesota and Illinois require operators to obtain a routing permit for new oil pipelines. Currently, just three Great Lakes states—Indiana, Minnesota and New York—are certified to regulate intrastate pipelines.

Another pipeline-related concern that has received public attention relates to the location and operation of the Enbridge oil pipeline (Line 5) that runs under the Straits of Mackinac, the narrow waterway separating the Michigan's upper and lower peninsulas. The Straits of Mackinac connect two of the Great Lakes, Lake Michigan and Lake Huron, and are five miles (8.0 km) wide and 120 ft (37 m) deep. The Straits connect lakes Michigan and Huron so that hydrologically the two are considered one lake.

Line 5 is part of the Enbridge Lakehead system, a network of pipelines that run from Superior, Wisconsin to Sarnia, Ontario. This system carries crude oil from Alberta and North Dakota. Part of the system runs from Superior to Chicago and then through southern Michigan. The other part of the system runs through northern Wisconsin, under the Straits of Mackinac and through Michigan, ending in Sarnia, Ontario after crossing the St. Clair River at Port Huron, Mich.

The Enbridge Line 5 pipeline is 30 inches wide and was built in 1953. Under the Straits, it splits into two, 20-inch wide pipelines built with thicker pipe walls and an additional external coating to minimize corrosion. It can carry up to 540 thousand bbl/d of natural gas liquids (NGL) and crude oil. According to the most recent information provided by Enbridge, there is no heavy crude oil from oil sands currently transported in this line.
Since the Straits of Mackinac are so important to the region economically, ecologically, historically and culturally, there are many concerns about the Line 5 pipeline that go above and beyond concerns expressed over pipelines in general. Some of these concerns include:

- The pipeline is more than 60 years old and has never been replaced; there could be corrosion issues that increase the risk of a spill.
- If Alberta oil sands crude were to be transported in this line, the operating pressure will have to be increased, which will increase the temperature in the pipeline and might have an impact on the integrity of the pipeline along with unanticipated ecological impacts.
- There are extreme conditions in the Straits—ice cover, challenging lake currents and the depth of the Straits—all of which would make an oil spill response extremely challenging.
- The unpredictable currents in the Straits (especially in winter) may create specific problems for responders trying to contain an oil spill. New modeling studies suggest that oil spilled in lakes Michigan and Huron would disperse rapidly and the recovery would be very challenging, especially if the material is oil sands crude.

The safe operation of this pipeline was addressed by the State of Michigan in a July 2014 letter to Enbridge from Michigan’s attorney general requesting that it address one particular issue pursuant to the 1953 “Straits of Mackinac Pipe Line Easement” granted by the State of Michigan. The easement requires that the pipeline be supported at intervals not to exceed 75 feet. Currently, the average distance between supports is 54 feet, but there are some unsupported spaces (acknowledged by Enbridge) that are more than 75 feet apart. The letter triggers a 90-day period during which Enbridge is required to “correct that specified non-compliance with the Easement or at a minimum, have commenced and diligently pursued remedial action as soon as it is reasonably possible.”

It should be noted that pipelines are the favored mode of oil transportation in North America and represent a significant means by which crude oil is transported into and throughout the Central and Prairie Provinces and the U.S. Midwest. Approximately 70 percent of oil sands produced in Alberta is shipped to refineries in the U.S. via pipeline. A major reason for producers favoring pipeline transportation is the cost. Transportation of crude oil via pipeline is, on average, $5 to $10 per barrel cheaper than via rail, presenting producers with an optimally cost effective shipping option when available. An important implication of this cost differential is that increasing production of oil sands crude in Alberta is likely to continue to drive industry movement toward new pipeline construction to support future transportation into the U.S. Midwest for refining.

Vessels

According to waterborne commerce data for the U.S. provided by the U.S. Army Corps of Engineers, no crude oil is transported on the U.S. side of the Great Lakes at the current time. On the Canadian side, over 19 million metric tonnes of refined petroleum products were transported on the Great Lakes and through the St. Lawrence River Seaway in 2011. Again, no crude oil was transported from Canadian Great Lakes ports. Larger ships traversing the Great Lakes and St. Lawrence River may carry hundreds of thousands of gallons of diesel fuel or bunker C fuel oil. And, as the production of domestic crude oil continues to grow, there has been an overall increase of crude oil transportation in the larger Great Lakes basin waterway system, which includes the inland waterways, rivers, and canals connected to the Great Lakes.

The increase in domestic production, affordable prices for oil sands crude and the refining capacity in the U.S. Midwest for oil sands crude have combined to create the demand to transport crude oil to refineries located in or near the Great Lakes basin. Recent statistics show that six refineries are in the Great Lakes basin in the U.S., while at least six refineries are located on or near the Great Lakes and St. Lawrence Seaway in Canada.
Table 2: Refineries and refining capacity in the Great Lakes states and provinces\(^4\)

<table>
<thead>
<tr>
<th>State / Province</th>
<th># of refineries in state or province</th>
<th>Total refining capacity (thousand bbl/d)</th>
<th># of refineries in Great Lakes basin</th>
<th>Refining capacity in Great Lakes basin (thousand bbl/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois</td>
<td>4</td>
<td>989,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Indiana</td>
<td>2</td>
<td>427,000</td>
<td>1</td>
<td>400,000</td>
</tr>
<tr>
<td>Michigan</td>
<td>1</td>
<td>123,000</td>
<td>1</td>
<td>123,000</td>
</tr>
<tr>
<td>Minnesota</td>
<td>2</td>
<td>413,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ohio</td>
<td>4</td>
<td>940,000</td>
<td>3</td>
<td>860,000</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>5</td>
<td>769,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>1</td>
<td>45,000</td>
<td>1</td>
<td>45,000</td>
</tr>
<tr>
<td>Ontario</td>
<td>4</td>
<td>438,000</td>
<td>4</td>
<td>438,000</td>
</tr>
<tr>
<td>Quebec</td>
<td>2</td>
<td>352,000</td>
<td>2</td>
<td>352,000</td>
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</tbody>
</table>

The need to move domestic crude oil quickly and efficiently has created incentive for industry to explore vessel transport of crude oil on the Great Lakes, not only to refineries in the eight-state, two-province region capable of refining the specific types of crude oil being transported, but also to refineries in the bordering states and provinces. This would also include shipment of oil through Chicago to barges that would traverse the Mississippi River to reach additional refineries in the U.S. Gulf Coast and through the St. Lawrence Seaway to refineries on the east coast of Canada and the U.S.

Most of the attention and interest shown in monitoring waterborne transportation of crude oil on the Great Lakes relates to the concern that a crude oil spill from a vessel could be catastrophic for the Great Lakes. The Great Lakes waters are pristine in many parts of the system, providing fish and wildlife habitat for hundreds of species. Because of the region’s geography (the Great Lakes are located approximately between the 41st and 49th parallels north), water bodies in the region (including the Great Lakes themselves) have the potential to be covered in ice for several months out of the year.

While oil spill response in water is always difficult, cold weather response operations—particularly those involving ice—are extremely challenging and fundamentally different from operations in open water and milder temperatures. Oil spill responders must understand the properties of oil in cold weather to inform the response strategy in conditions of freeze up, full ice and ice break up. While studies have been conducted by researchers in government, academia and the private sector, much of this research has focused on cold weather response in the maritime waters of Alaska and the Arctic region. While this information is relevant for the Great Lakes-St. Lawrence River, many of the tools and spill response techniques have yet to be tested in the freshwater environment of the Great Lakes.

It is important to note that vessel transportation of commodities has several advantages over other transportation modes such as rail and truck. Although economic and logistical factors are important (and often pivotal) in mode choice decisions, environmental and safety issues and benefits are becoming increasingly important in the decisionmaking process. In this regard, vessel transportation generally fares very favorably when compared with other modes of transportation. For instance, vessel transportation generally is safer, uses less fuel and produces fewer emissions than rail or truck transport when compared with equivalent commodity hauls. Also, marine transportation is the preferred mode and performs the best related to impacts associated with congestion and noise. Vessels operating on the Great Lakes and St. Lawrence River are quieter than rail and trucks and the noise they produce is generally away from population centers. Finally, due to the good track record of the marine transportation industry and the advances in spill preparedness and response programs under the U.S. Oil Pollution Act and similar laws in Canada, water borne transportation of oil and petroleum products is generally considered to be safe in comparison with other modes.

In late 2013 the Alliance for the Great Lakes issued a report titled *Oil and Water: Tar Sands and Crude Shipping Meets the Great Lakes*\(^5\) It presents the potential impacts of the production and movement of oil sands on the Great Lakes and describes the state of preparedness in the region, the regulatory framework and the federal and state response programs, and the need to strengthen these programs. While this report acknowledges that waterborne transportation of crude oil is not occurring on the Great Lakes proper and currently represents only a small percentage of the crude oil being transported to and through the region, it warns about the possibility of this mode
Great Lakes Commission       Summary

playing a more prominent role in the future and the need for the region to be adequately prepared to respond to a spill if one were to occur.

Rail

Limitations facing pipeline transport (such as capacity and the fixed location of pipelines) combined with attractive economics have spurred demand for crude oil transportation via rail. The Association of American Railroads reports that for the first half of 2014 (compared to the same period in 2013) there was a seven percent carloads increase in the U.S. and a 7.7 percent increase in Canada—to totaling 380,961 carloads and 188,423 carloads carrying petroleum and petroleum products in each nation by mid-year, respectively. However, the increase over the last six years is far more striking: In the U.S., 9,500 carloads of crude oil were carried by train in 2008, with 650,000 carloads forecasted by the end of 2014, a more than 68-fold increase. In Canada, 500 carloads were carried in 2009 and an estimated 140,000 carloads will be carried in 2014, a 28-fold increase.

The increase in transportation of crude oil via rail has garnered much attention in the Great Lakes-St. Lawrence River region since the Lac-Mégantic train derailment and explosion in July of 2013. Since that time, at least eight other rail-related spills/accidents have occurred in the U.S. and Canada (see Table 1) creating a public debate about the safety of transporting crude oil by rail and the adequacy of the regulatory regime to keep pace with the rapid increase in transportation by this mode.

At least 10 governmental studies have been released since mid-2013 (after the Lac-Mégantic incident) examining issues surrounding the transportation of oil. These reports are listed in the bibliography that accompanies this report. Several of the reports examine multi-modal transportation (i.e., pipeline, vessel and rail) but at least six are focused exclusively on issues surrounding the increase in transportation of crude oil by rail. All of these reports (some of them focusing on national issues and concerns related to oil transportation) reference the Lac-Mégantic tragedy and underscore how this event needs to serve as a wakeup call to both countries to ensure that oil transportation is done safely and efficiently in order to protect the environment, improve public safety and safeguard communities in both countries.

These reports were written in the face of uncertainty about the ability of the U.S. and Canada pipeline network to respond to the increase in demand for oil transportation and the trend—noted above—of oil producers turning to rail transportation as a quick and flexible alternative to pipeline transport.

Legislation has been introduced in both Congress and Parliament following the Lac-Mégantic incident that would address issues related to minimum crew complements, crew training, changes in tank car designs, route selections for trains carrying crude oil, communications with states, provinces and communities regarding when and where oil is being transported and other issues. Regulatory agencies are also investigating ways that rail transport of crude oil can be made safer. While the response from government has been prompt, it has still been a struggle for the legal and regulatory regime to keep pace with the market-driven increase in rail transportation. Legislative and regulatory actions and changes are described more fully in Issue Brief Four.

Rail transportation has some key advantages over other modes of transportation. Rail is much more flexible than pipelines or shipping crude oil by vessel or barge. This flexibility relates to the vast network of rail lines already in place and the relative ease of adding a “spur line” to allow for transport of oil directly from an oil field to a main rail line. Statistics show that railroads consistently spill less crude oil per ton mile than other modes of land transportation. Also, with existing infrastructure that supports greater access to new production areas and more refining locations, rail provides a wider range of geographic options. Rail transport allows producers to make more rapid changes in delivery location as market demand shifts, and with the added advantage of transporting oil much faster. For example, a trip from the Bakken oil field to the U.S. Gulf Coast can take up to 40 days via pipeline versus five to seven days by rail.
**Summary and Key Findings of the Issue Briefs on Oil Transportation in the Great Lakes-St. Lawrence River Region**

Four issue briefs were prepared by Commission staff to provide detailed information regarding the background, status, emerging issues and implications surrounding specific aspects of the oil transportation issue. These cover the following topics:

- Developments in Crude Oil Extraction and Movement;
- Advantages, Disadvantages, and Economic Benefits Associated with Crude Oil Transportation;
- Risks and Impacts Associated with Crude Oil Transportation; and
- Policies, Programs and Regulations Governing the Movement of Crude Oil.

A brief summary of the four issue briefs and the general findings gleaned from them is provided below, including emerging issues that might require further study and action on the part of government agencies (either federal, state or provincial) and industry.

**Issue Brief 1: Developments in Crude Oil Extraction and Movement in the U.S. and Canada**

States, provinces and tribal governments across the Great Lakes region experience the benefits from but also assume many of the risks of crude oil transportation. The risks and benefits vary greatly depending on several factors, such as the type and amount of oil transported, where the oil is refined and the mode of transportation used to get the oil to its destination. In North America, oil sands reserves are found primarily in Alberta, Canada. Oil sands crude is a nonconventional type of oil that, when initially extracted, is made up of inorganic material, water and bitumen, a viscous form of petroleum. Approximately 70 percent of oil sands products from Canada is sent to refineries in the Midwest. As of 2009, 26 refineries were equipped to process this type of crude oil, 12 of them located in Great Lakes states.

Shale oil, also called light tight oil, is another type of nonconventional crude oil and is found in low permeability sedimentary formations. It is much more volatile than other types of crude oil and has a flash point that resembles that of gasoline, making it very flammable and potentially explosive. A large amount of the shale oil extracted in the U.S. comes from the Bakken formation in North Dakota. In the Great Lakes region there are also several small oil reserves in Ohio, Pennsylvania and New York, as well as some shale oil production in northern Michigan.

<table>
<thead>
<tr>
<th>Table 3: Characteristics of Bakken crude oil and Alberta oil sands crude oil</th>
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<tbody>
<tr>
<td><strong>Bakken shale crude oil</strong></td>
</tr>
<tr>
<td>Also called</td>
</tr>
<tr>
<td>Origin</td>
</tr>
<tr>
<td>Density</td>
</tr>
<tr>
<td>Main extraction method</td>
</tr>
<tr>
<td>Main transportation method in the Great Lakes</td>
</tr>
<tr>
<td>Transportation challenges</td>
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Large quantities of crude oil from Alberta and North Dakota move into or through the Great Lakes and St. Lawrence River basin every day, making the region an important link in the oil transportation and refinement process. Crude oil from the Alberta oil sands may pass through the region to other refineries or may be processed at refineries along the lakes. Most Bakken crude, on the other hand, passes directly through the region on its way to refineries elsewhere. Even though the physical characteristics of oil sands crude and shale oil differ markedly, both have the same United Nations (UN) classification. This single classification gives very broad criteria and restrictions for transportation. However, physical differences between the two types of oil mean they present different transportation issues and challenges.

Pipelines are the traditional preferred mode of transportation for petroleum products. With pipelines, different types of crude oil from different origins and with different characteristics can be transported in the same line. Requests have been made both to build new pipelines and to increase the capacity of the existing pipeline network by, for example, allowing higher pressures within the lines or changing their direction of flow. However, the increased production of Bakken shale oil and of Canadian oil sands products has exceeded the transportation capacity of the existing pipeline network. As a result, rail has recently become the alternate transport mode relied upon most frequently.

Rail now accounts for more than 50 percent of the oil sands and shale oil products transported, either in unit trains consisting strictly of tank cars carrying crude oil to a single destination, or as mixed trains hauling a variety of cargos to various destinations. Regardless of the type of train, crude oil transported by rail is most often carried in Class 111 tank cars that have been criticized as being out of date and insufficient for transportation of light tight oil.

Trucks are a marginal mode of transportation for crude oil. Individual tanker trucks hold less oil than other modes of transportation and are predominantly used for local transportation of crude oil, usually from the extraction site to pipeline or rail loading stations. In locations where the extraction site and the refineries are in close proximity, such as in Texas, trucks are used more often.

**Issue Brief 2: Advantages, Disadvantages and Economic Benefits Associated with Crude Oil Transportation**

Accelerating unconventional crude oil production in the U.S. and Canada has generated increasing demand for transportation capacity between emerging areas of extraction and refinery locations. The binational Great Lakes-St. Lawrence River region is a hub of both transportation and refining activity.

As mentioned earlier, oil and petroleum products provide societal and economic benefits to the U.S. and Canada. Oil is an important part of the energy portfolio of both countries, including the Great Lakes-St. Lawrence River region. Oil supports the energy needs of the region’s residential, institutional and commercial/industrial customers and the regional and local economies by contributing to the tax base of states, provinces and communities. Oil production provides billions of dollars of annual revenue for the U.S. and Canadian federal, provincial, state, and tribal governments in the form of royalties, rents, bonuses, income taxes and other payments. In terms of employment, from 2009 to 2013 job growth in the oil and gas industry far exceeded average employment increases for all industries in the U.S. and in some sectors in Canada. These employment increases tend to be focused in production-heavy areas, and predicted growth may continue to benefit some parts of the region more than others. Increasing domestic production and expansion of transportation capacity also contribute to oil price stability, with transport access boosting profit margins for industry, which can also increase revenues to government. Producer profit per gallon of crude oil – the “netback” sales revenue minus transportation costs – can be much higher when oil reaches better markets. Higher demand at these markets allows producers to sell their crude oil for more money than it costs them to transport it there. This is a key driver of demand for growing crude oil transportation capacity and options.

Local governments incur costs associated with infrastructure development, training and capacity building for first response duties for oil spills. For some municipalities, this means that local taxpayers are shouldering economic impacts of resource development for potential emergencies without necessarily receiving substantial gains from oil production, extracting, or refining activities and associated royalties or taxation from industry. In particular, much of the Bakken crude oil transiting via rail through the Great Lakes region is destined for East Coast refineries. Thus, in
these cases, communities absorb first responder costs without receiving economic benefits or associated jobs. Transport can also adversely impact other industries via land use, shared infrastructure and traffic congestion.

There are also advantages, disadvantages and varying degrees of risk associated with the different modes of oil transportation. Despite being more expensive than pipeline transport, oil transport by rail allows producers to respond to changing market conditions by being more geographically flexible, providing much shorter transit contract term periods, and offering far faster delivery times to coastal markets. However, tank car shortages and adverse weather can negatively impact the use of rail. Limited pipeline capacity has created an increase in rail usage: in the U.S., 9,500 carloads of crude oil were carried by train in 2008, with 650,000 carloads forecasted by the end of 2014. An immature crude-by-rail regulatory framework – especially single category classification of different crude types and the lack of crude oil cargo reporting requirements – constrains local government ability to appropriately prepare for possible incidents. Increased crude-by-rail traffic can also crowd out rail access by other sectors, including agriculture and passenger transit.

Liquid pipeline is the favored mode of transport by the oil industry and approximately 70 percent of Alberta oil sands crude is shipped to Midwest refineries via pipeline. Pipeline transport is cost effective and can provide easement revenue to landowners in the U.S. However, new construction can interfere with agriculture and other land uses, and inconsistencies in state laws combined with a lack of federal permitting can make easement land restoration and payment enforcement difficult.

There is not currently ship or barge transit of crude oil on the Great Lakes, but there has been a dramatic increase in crude oil transported on inland waterways connected to the lakes. Vessel-based transit would capitalize on existing coastal refinery infrastructure and the efficiencies inherent in transporting any/all heavy bulk goods by water. But the ecological, economic, and human health impacts and risks of day-to-day transit of crude oil on the Great Lakes are unknown but certainly warrant close scrutiny given the sensitivity of the Great Lakes freshwater environment. Poor weather and seasonal ice cover would also impede shipping functionality.

Tank trucks play a role in moving crude oil from production areas to pipeline and rail transport or between different modes, but on the whole, relatively little is moved via truck in the region. Increased tank truck traffic would likely cause localized congestion and greater wear and tear on roads.

Issue Brief 3: Risks and Impacts Associated with Crude Oil Transportation

More than 36 million people – about 23 million in the United States and 13 million in Canada – rely on the Great Lakes for drinking water, jobs and to support their way of life. This represents roughly 8 percent of the U.S. population and 32 percent of Canada’s. As the world’s greatest system of freshwater resources, the Great Lakes and the St. Lawrence River have shaped the economic, social and cultural heritage of the region for hundreds of years and continue to have a profound influence on the regional and national economies of the U.S. and Canada.

With the recognition of the important role that oil plays in providing the energy needs of the two countries, the recent increase in crude oil shipments needs to be properly understood with regard to risks and impacts. The different modes of transportation pose environmental and safety risks from accidents that may occur from pipelines, rail lines, waterways and at transshipment sites. The risks can be further complicated based on the properties of oil being transported. Because of the diverse nature of oil and the different ways that spills can occur, it is difficult to predict the extent and duration of their impacts on the ecosystem, human health and the economy.

In the Great Lakes states 55 percent of the pipelines traversing the region were installed prior to 1970 and nationally in Canada, approximately 48 percent were installed more than 30 years ago. The main risks associated with pipelines are infrastructure concerns (e.g., quality of the material and welds), natural hazards and extreme weather conditions, adequate monitoring, an outdated regulatory regime and geography (i.e., challenges presented by the physical environment).

With regard to vessel transportation risks, it is important to note that there is currently no crude oil being transported by ships and barges on the Great Lakes. There are some who are concerned about this trend changing in the near future as transportation demands increase. The risks associated with water-borne transportation are collision between
two or more ships and between a ship and infrastructure, grounding, severe weather conditions and human error associated with piloting the vessel on the water and in ports.

With regard to rail transportation risks, the recent growth in volume of oil transported by this mode, coupled with numerous recent accidents, have elevated the importance of understanding the safety and environmental risks associated with the transport of crude oil by rail. The main rail-related risks are the state of infrastructure (rails, welds), tank car design and safety (i.e., Class 111—DOT-111—tank cars) railroad crossings, lack of information on mixed trains’ cargo, high volume of crude oil transported in unit trains, an immature regulatory regime and lack of human capital planning.

Although trucks transport only a small percentage of the total oil being moved in the U.S. and Canada, and an even smaller percentage in the Great Lakes region, the increase in truck oil shipments can be a cause of concern. The risks are mainly related to in-route collision, inadequate infrastructure, inadequate truck safety design, and an immature regulatory regime.

Transshipments sites, where oil is moved from one mode of transportation to another mode or to a storage facility, can also be a source of risk. Some Great Lakes transshipment sites are becoming more important because of their geographic location. The risks at these sites can come from equipment failure, human error, inadequate storage and maintenance, regulatory regime and unmonitored docked cargos.

The potential impacts of a spill in the Great Lakes-St. Lawrence River region are particularly important and need to be better understood. These impacts might be economic, societal, environmental or human health-related or a combination of these. The human health concerns might include impacts to drinking water, air contamination, and explosion as the result of a spill, leak, a derailment or a collision. The economy of a region might be detrimentally affected by spills causing impacts to commercial and sport fishing, tourism and recreation and disruption of business and normal day-to-day activities. The cost of a spill cleanup can also be high and the liability insurance limits might not always be sufficient to cover these costs. Finally, a spill can have a negative impact on the environment. In open water and on the shoreline, sunken heavy crude oil can be hard to recover. It can detrimentally impact aquatic flora and fauna. An inland spill might also result in toxic contamination of soils and groundwater aquifers.

**Issue Brief 4: Programs, Policies and Regulations Governing the Movement of Crude Oil**

Heightened societal awareness of issues and problems triggered by significant events (such as a large oil spill) often leads to changes in governmental policies and programs. The *Exxon Valdez* oil spill off the coast of Alaska in March 1989 spurred the U.S. into action, with the enactment of the Oil Pollution Act (OPA) in 1990. More recently, the U.S. and Canada have begun examining their oil-related programmatic and regulatory regimes due to the attention created by numerous spills from different transportation modes and oil production practices. Both countries are enacting changes to amend or strengthen existing programs to ensure that the current regulations meet the challenges and risks generated by increased oil production and transportation. Similar scrutiny is occurring in the Great Lakes-St. Lawrence River region.

There are two major factors driving regulatory and programmatic changes in both countries and in the region. First is the increased frequency and severity of oil-related accidents in recent years. In 2010, an oil pipeline ruptured near Marshall, Mich. spilling nearly one million gallons of crude oil into nearby Tallmadge Creek (a tributary to the Kalamazoo River) triggered one of the largest inland area spill cleanups in U.S. history. In 2013 the region was reminded again of the dangers of oil transportation when a train transporting crude oil derailed and exploded in Lac-Mégantic, Québec killing 47 people and causing billions of dollars in damages to the town. While the Lac-Mégantic accident captured the attention of the public and demanded a response from government officials it was soon followed by other oil transportation-related accidents, four of which occurred in the Great Lakes states. These alarming incidents have caused both U.S. and Canadian officials to analyze their regulatory regime for oil transport and to enact stronger laws and policies. Both countries, in order to strengthen existing policies, have ordered emergency regulatory measures be undertaken, assessed the inspection of rail cars, and implemented response policies for both companies involved in oil transport and the federal agencies that regulate them.
In the U.S. the transport of oil by is governed by a complex set of regulations varying by mode. Ships transporting oil are governed by OPA with the U.S. Coast Guard having the regulatory lead for oceans and the Great Lakes and U.S. EPA having the lead for inland areas. Canada has enacted similar laws governing oil transportation by vessel, the primary law being the Canada Shipping Act. The Act led to the creation of the National Spill Response Plan developed by the Canadian Coast Guard to address marine emergencies for the Great Lakes, connecting channels and the St. Lawrence River. The plan addresses spills that impact Canadian waters from vessels in transit and during loading and unloading operations. Great Lakes binational agreements such as CANUSLAK (the joint marine pollution contingency plan) and CANUSCENT (the joint inland pollution contingency plan) prompted by the Great Lakes Water Quality Agreement provide the framework for well-coordinated emergency preparedness and response between the two countries.

In the U.S., pipelines are regulated by the Department of Transportation (DOT) through its Pipeline and Hazardous Material Safety Administration (PHMSA). States have some authority under the Pipeline Safety Act to enact stricter standards, but most states have not done so. Rail transport is governed under DOT’s Federal Railroad Administration (FRA). A potential strength of these individual regulatory bodies is the opportunity to create strong policy that focuses on just one mode of transportation. Conversely, focusing on just one aspect of transportation can lead to a lack of coordination and harmonization among regulations, regulatory and response agencies.

In Canada, pipeline transportation is governed by the National Energy Board (NEB). Canadian pipeline regulations set standards that industry must meet while allowing companies the flexibility to determine how to best meet them. Specifically, the NEB oversees oil transport for both interprovincial and international pipelines. Canadian governance of rail transport is similar to the U.S. and safety standards developed by the rail industry apply in both countries. Transport Canada sets regulatory standards under the Railway Safety Act as well as the Transportation of Dangerous Goods Act.

Recently, both countries have noted gaps in their regulatory regimes for rail and are taking steps, such as strengthening classification and labeling requirements, to fill those gaps. As these standards become stricter and agencies continue to promulgate rules, the hope is that the number of accidents will decrease while the effectiveness and timeliness of response actions will increase.

**Key Findings and Observations**

**General Findings**

- **The Great Lakes and St. Lawrence River region is particularly dependent on petroleum and related products**

  Oil and oil products have played an important role in the development of the U.S. and Canada and oil still plays a predominate role in the energy mix of the two countries. The Great Lakes-St. Lawrence River region is particularly dependent on petroleum products because of the makeup of the regional economy; including power generation, manufacturing and chemical industries, among others.

- **There has been a significant increase in North American crude oil production over the past six years**

  In recent years domestic production of crude oil in the United States (primarily from the Bakken formation, the Alberta oil sands and the Permian and Eagle Ford fields in Texas) has increased at a tremendous rate. This increased production is predicted to continue into the future, creating significant challenges in transporting crude oil to refineries and destination points. The rapid expansion of crude oil production since 2009 has been striking: total production reached 7.4 million barrels per day (bbl/d) in 2013, up from 5.35 million bbl/d five years prior in 2009 – an increase of 38.5 percent. The forecasted output for 2015 represents what will be the highest level of domestic production in the U.S. since 1972: 9.3 million bbl/d, a 75 percent increase over 2009 levels. The Bakken shale oil production was a little over one million barrels in 2005 and increased to almost 300 million barrels in 2013. The Alberta oil sands crude production has also been increasing in the last few years, with production increasing from 352,000 barrels in 2005 to 708,000 barrels in 2013.
Pipeline transport of oil is the traditional preferred mode of oil transportation in North America due primarily to reliability and cost advantages.

Pipeline transport of oil is the main mode by which oil is transported into and throughout the Central and Prairie Provinces and the U.S. Midwest. Approximately 70 percent of oil sands produced in Alberta is shipped to refineries in the U.S. via pipeline. A major reason producers favor pipeline transportation is cost. Transportation of crude oil via pipeline is, on average, $5 to $10 dollars per barrel cheaper than via rail, presenting producers with an optimally cost effective shipping option when available. An important implication of this cost differential is that the increasing production of oil sands crude in Alberta is likely to continue to drive industry movement toward new pipeline construction to support future transportation to U.S. and Canadian refineries.

There has been a tremendous increase in the transportation of crude oil by rail, with Canada experiencing a 28-fold increase since 2008 and the U.S. experiencing a single-year increase of 423 percent from 2011-2012.

The Association of American Railroads reports that for the first half of 2014 (compared to the same period in 2013), there was a seven percent carloads increase in the U.S. and a 7.7 percent increase in Canada. However, the increase over the last six years is far more striking: In the U.S., 9,500 carloads of crude oil were carried by train in 2008, with 650,000 carloads forecasted by the end of 2014, a more than 68 fold increase. In Canada, 500 carloads were carried in 2009 and an estimated 140,000 carloads will be carried by the end of 2014, a 28-fold increase.

There is currently no crude oil being shipped by vessel on the Great Lakes. However this could be a possibility in the future.

Currently, no crude oil is transported on the Great Lakes and no vessels operating on the Great Lakes currently are equipped to transport crude oil. There is a fleet of tanker vessels operating on the St. Lawrence River. In Canada, over 19 million metric tonnes of refined petroleum products were transported on the Great Lakes and through the St. Lawrence River Seaway in 2011. Again, no crude oil is transported from Canadian Great Lakes ports. The tanker vessels traversing the Great Lakes and St. Lawrence River carry hundreds of thousands of gallons of diesel fuel or bunker C fuel oil. And, as the production of domestic crude oil continues to grow, there has been an overall increase of crude oil transportation in the larger Great Lakes basin waterway system, which includes the inland waterways, rivers, and canals connected to the Great Lakes.

Oil Extraction and Movement

There are conflicting reports about the characteristics of Bakken crude oil that can have an impact on the transportation process by rail.

Some recent train accidents involving Bakken crude oil resulted in major explosions. There is a common perception that Bakken crude oil is more volatile and explosive than other types of crude oil. However, industry reports have concluded that the physical properties of Bakken crude oil do not make it more dangerous than other similar products transported by rail.

The characteristics of Alberta oil sands present particular challenges in the transportation of the product.

Oil sands crude is made up of 75-80 percent inorganic material, 3-5 percent water and 10-12 percent bitumen, a viscous form of petroleum. Due to its high viscosity and density, raw bitumen must be processed to make transportation easier and more efficient. The most commonly used techniques for pipeline transportation are upgrading (creating synthetic crude oil) and diluting (with gas condensate or synthetic crude oil). Other methods include emulsion and core annular flow (surrounding the crude oil with a film of water or solvent near the pipe wall). For rail transportation, tank cars have to be heated to reduce the viscosity, which can be costly and possibly increase the potential for internal corrosion.
The Great Lakes and St. Lawrence River region are both an impediment (a geographic “roadblock”) as well as an important link in the oil transportation and refinement process. Pipelines and railroads must – for the most part – go around the Great Lakes (with the notable exception of pipeline crossings in the Straits of Mackinaw and Port Huron-Sarnia). Six American and six Canadian refineries operate within the Great Lakes drainage basin and there are 25 refineries total operating in the eight-state, two-province region. These facilities combined refine nearly five million bbl/d of crude oil. While these refineries represent destination points within the region, the region is also experiencing challenges due to the large amounts of domestic crude oil that are being transported through the region (primarily via rail tankers and pipelines) to refineries and other destination points outside of the region.

Bakken crude oil passes directly through the region to refineries located elsewhere. In the Great Lakes region, much of the Bakken crude oil traveling by rail is being transited through to refineries in other areas, including the East Coast and the Gulf Coast. This creates situations where oil trains are passing through some states and provinces regularly with the associated risks but without producing economic benefits through refining activities or transmodal transfer points.

Oil Transportation Advantages, Disadvantages and Economic Benefits

Job growth in the oil and gas industry has exceeded average growth for all industries in the U.S. and in some sectors in Canada. In the binational Great Lakes region, oil and gas industry employment impacts are mixed and widely varying. For example, the provinces of Ontario and Québec, as well as New York state, saw net losses in oil and gas industry jobs between 2009 and 2013, while some states, such as Pennsylvania, Indiana, and Minnesota, each saw increases of over 100 percent in industry employment numbers. Increases in employment have been largely focused in production-heavy regions and should not be considered equally distributed throughout both nations or across all states and provinces. The U.S. Department of Labor predicts that strong employment growth in oil and gas extraction and support will persist, but this growth may likely continue to benefit some parts of the region more than others.

The oil industry provides government revenue from oil production via income taxes and royalties. Oil production is a critical source of revenue for the U.S. and Canadian federal, provincial, state and tribal governments. In fiscal year 2013, revenue from the oil and gas industry paid to the U.S. government, including royalties, rents, bonuses, and other payments, totaled $12.64 billion – with oil industry payments being one of the largest sources of non-tax federal revenue. In Canada, the province of Alberta received $3.56 billion in royalties related to oil sands production in 2013 alone, while Canadian oil and gas extraction and supporting activities accounted for $2.42 billion in income taxes to the national government in tax year 2012.

Pipeline construction generates income to landowners and costs to industry, such as agriculture and forestry. Pipeline siting procedures typically involve easement or “right-of-way” agreements where private or public owners retain a legal title to their land, but give up certain rights to specific usage of the land to pipeline operators. Pipeline operators pay landowners in exchange for limited rights to construct, operate, and maintain pipelines on their land. Such agreements can provide an additional source of income for private landowners, in addition to a source of funds to governments for those pipelines constructed on government land. The construction of pipelines can present disadvantages to agricultural landowners holding productive farmland whose field crops, livestock, drainage tiles, etc., may be adversely impacted in the process of installing lines. Pipeline construction can also interfere with timber operations and that of other industries, depending on the siting location.
Rail provides greater flexibility than transporting oil by pipelines or vessel and is often faster than transporting oil by pipeline

The greater flexibility of rail transportation relates to the vast network of rail lines already in place and the relative ease of adding a “spur line” to transport oil directly from the oil field to a main rail line. Also, with an existing infrastructure that supports greater access to new production areas and more refining locations, rail provides a wider range of geographic options. Rail transport allows producers to make rapid changes with regard to delivery locations as market demand shifts with the added advantage of transporting the oil much faster. For example, a trip from the Bakken oil field to the U.S. Gulf Coast can take up to 40 days via pipeline versus five to seven days by rail.

Vessel transportation of bulk commodities is generally safer, uses less fuel and produces fewer emissions than rail or truck transport when compared with equivalent commodity hauls

Various modal shift studies have been undertaken going back as early as 1970. In a 1993 Modal Shift study conducted by the Great Lakes Commission for numerous U.S. and Canadian transportation entities, it was found that rail fuel use was 44 percent higher than the marine counterpart and emissions from rail were 47 percent higher than for vessels for the same quantity of material transported. A 2005 update of the 1993 study showed that while rail transport had improved significantly in the area of emissions, marine transportation was still much more fuel efficient and still produced fewer emissions, especially in scenarios where truck transport and rail transport were considered together.

Risks and Impacts of Oil Transportation

The recent increases in crude oil shipments to and through the Great Lakes-St. Lawrence River region poses environmental and safety risks from accidents that may occur from pipelines, rail lines, waterways and at transshipment sites

Since 2010 the use of land and water transport networks to connect energy extraction sites in the Western U.S. and Canada with refineries and ports on the East, West, and Gulf Coasts has grown exponentially. Transport of two types of crude oil has dramatically increased across the Great Lakes states and provinces and through the region’s waterways: light crude shale oil, particularly from North Dakota’s Bakken shale and heavy oil sands crude from Northern Alberta region. As oil production and transportation volumes continue to increase, all the modes of crude oil transport - pipelines, rail, vessel, barge and trucks – as well as the transshipment locations where oil is moved from one mode of transport to another, pose potential risks to the environment, public health, and safety.

There is a need to better understand the relative risks of oil spills associated with increased transportation of crude oil

It is difficult to predict the extent and costs of impacts from oil spills to the ecosystem, human health and the regional economy. As such, a better understanding of relative risks associated with oil spills becomes extremely important. There is a need for a complete study of relative risks and impacts that systematically considers all the factors for each mode of transport—economic consequences, incident rates, fatality rates, long-term environmental damages, etc.—in order to develop a more comprehensive regional approach to reduce the risks of spills. Risk assessments including scenario-based research and focusing on the distinctive risks and impacts for each mode of transport are needed. All the modes of crude oil transport through the Great Lakes-St. Lawrence River region pose certain risks that depend on a number of factors – the type of crude oil being transported, the route and destination of transport, population density of areas where oil is being transported to and through, environmental protection concerns, ecological variability and vulnerability, state of emergency preparedness and response capabilities in the region, climate and weather conditions, among others.
The risks and costs of increased oil transportation to government agencies need to be studied and better understood

A better understanding of governance risk can affect the way that risks are managed and impacts are mitigated. For instance, costs of emergency preparedness and response may be disproportionately borne by state, provincial and local governments, especially when oil is passing through a region to markets and refineries on the West, East or Gulf Coasts. Another concern is the issue of oil spill liability, which is not always fully addressed by the market or by existing regulatory programs. In the case of rail transport, shipping companies are often underinsured and the costs of accident remediation may exceed the insurance coverage available in the commercial market. Although shared liabilities is a possible solution (where the government bears the costs over and above the cap limit provided by insurance companies) the use of public money to support oil spill remediation has attracted public scrutiny. The issue of liability when the oil is in transit is another complicating factor. Existing regulatory regimes (e.g., airline safety regulations) may provide models that can be used to evaluate the safety and response mechanisms for the various modes of transport that ship crude oil.

The age and quality of infrastructure is a concern for most modes of oil transportation, which poses an increased risk for a spill or accident

Numerous studies have identified the age and quality of infrastructure as a factor increasing risks for spills, especially for pipelines, trains and rail lines, and transshipment sites. The age and quality of pipeline infrastructure may be important contributors to increased oil spill risk in the Great Lakes region. According to the Office of Pipeline Safety, much of the pipeline infrastructure has been in place for decades. In the Great Lakes States, 55 percent of the pipelines were built prior to 1970. While it is difficult to deduce the age of pipeline infrastructure in the Canadian provinces, the National Energy Board’s statistics from July 2011 show that approximately 48 percent of Canadian pipelines carrying hazardous liquids were installed more than 30 years ago. Additionally, incident data collected by the Pipeline and Hazardous Material Safety Administration (PHMSA) show that the most common cause of spill incidents is pipeline infrastructure failure. Studies of Federal Railroad Administration (FRA) data show that 60 percent of freight-train accidents are caused by derailments. The major causes of derailments are broken rails or welds, buckled track, obstructions and main-line brake malfunctions. Some derailment incidents, such as that in Aliceville, Alabama, point to failure of trestles, which are sometimes antiquated and not always adequately maintained. The most common risk associated with shore-side transshipment facilities relate to technical failure and defects of equipment such as an oil loader that can cause oil to spill.

Communications between oil companies, oil transporters, regulatory and response agencies is important but is often lacking and can be better coordinated to help improve preparedness and reduce the risk from spills

Emergency preparedness and response efforts are often complicated by the lack of communication between oil producers, shippers, carriers, regulatory agencies and state/provincial and local emergency responders. For pipelines, communication between pipeline companies, the pipeline regulatory agencies (U.S. DOT’s PHMSA and Canada’s National Energy Board, NEB) and response agencies (federal, state and provincial) needs to be improved. For railroads, similar coordinated efforts to improve communication need to occur between the FRA and Transport Canada and response agencies at the federal, state and provincial level. Opportunities for improved communication may include cross-agency/industry participation in exercises, broader participation with the Regional Response Teams (RRTs) on the U.S. side and the Regional Environmental Emergency Teams (REETs) in Ontario and greater use of Memoranda of Understanding between agencies and jurisdictions to improve communications.

Oil Transportation Programs, Policies and Regulations

The increase in oil production and transportation, particularly rail transportation of oil, is outpacing the development and implementation of regulatory, enforcement and inspection programs
The rapid increase in the volume of crude oil transported by rail has created challenges to strengthen existing or develop new federal regulatory, inspection and enforcement programs in the U.S. and Canada. Rulemaking and staff training processes can take years to complete. This is important because the lack of a mature regulatory regime places an initial and disproportionate burden on states, provinces, and local governments regarding emergency preparedness and response in the event of a spill.

- **A review of the funding and adequacy of inspection and enforcement protocols and the timeliness of spill reporting across all modes will help identify gaps in regulatory, prevention and response programs**

Weaknesses in governmental and industry programs (inspection, enforcement, preparedness and response) related to oil transportation is a common theme among numerous governmental and nongovernmental reports issued since the summer of 2013. A thorough review of these programs will be helpful to the Great Lakes and St. Lawrence River Region in determining regulatory and programmatic gaps that need to be addressed to provide for greater safety and reducing the risk associated with transporting oil into and through the region. In its 2012 report to the Great Lakes Commission, the Great Lakes-St. Lawrence River Emergency Preparedness Task Force called for a review of funding of programs for emergency preparedness and response in order to ensure that the region is well-protected in the event of a spill. A 2013 Audit conducted by the Department of Homeland Security Investigator General found that U.S. Coast Guard does not have an adequate number of trained personnel or a process with dedicated resources to investigate, take corrective action or enforce Federal Regulations related to reporting of marine accidents. Data collection and reporting for oil transportation in the region was also indentified by the Task Force as a priority to help preparedness and response agencies better understand the movement of oil in and through the region.

- **The Great Lakes States and Provinces are not taking full advantage of opportunities to assume oversight of pipeline safety, inspection and enforcement**

U.S. DOT’s PHMSA implements pipeline design, construction, operation, maintenance, and spill response planning provisions. PHMSA is the only agency authorized to prescribe safety standards for interstate pipelines. While the states have the ability to assume some aspects of pipeline siting, regulation, inspection and enforcement within the Great Lakes region, only a few states have chosen to regulate the safety and environmental impacts of oil pipelines. States may assume oversight of pipeline regulatory, inspection and enforcement responsibilities for intrastate pipelines through an annual certification based on state adoption of the minimum federal regulations established by PHMSA. Three Great Lakes States -- Indiana, Minnesota, and New York -- have certified programs. Illinois, Michigan and Minnesota are the only Great Lakes states that require permits for new oil pipeline construction.

In Canada, the National Energy Board (NEB) is authorized to sign Memorandums of Understanding (MOUs) with provincial government regarding certain aspects of pipeline, safety, inspection and response. No MOUs are currently in place in Ontario or Québec.

- **Plans to retrofit and/or eliminate DOT-111 tank cars and replace them with newer, safer models will significantly improve the safety of oil transportation by rail**

A notable weakness in the rail regulatory framework is the need to upgrade Class 111 (commonly called DOT-111) tank cars, which use a flawed design that was involved with at least 40 serious accidents between 2000 and 2012. PHMSA and the FRA have undertaken a number of actions to improve rail car standards and are moving forward with a rulemaking to enhance tank car standards. PHMSA is seeking to impose additional safety standards on the DOT-111 tank cars. The proposed rule, published July 23, 2014, was one of four amendments recommended by the National Transportation Safety Board. The notice of proposed Rulemaking proposed enhanced tank car standards, classification testing and new operations requirements that include braking controls and speed restrictions. Specifically, the rule proposes phasing out DOT-111 tank cars for the shipment of packing group I flammable liquids, including most Bakken crude oil, unless the tank cars are retrofitted to comply with new tank car design standards.
Pursuing additional improvements to rail transportation safety, including adopting new technologies and dual person crew requirements may help lessen the number of rail accidents

Recent reports from both the U.S. and Canada on the safety of rail transportation have identified weaknesses and improvements that will help lessen the number of rail accidents. These improvements include installing positive train control (PTC) in all trains, designed to override human error in controlling train speed, and enforcing adequate inspection and labeling procedures of cargo. In addition, the U.S. Congress is pursuing legislation that would require two-person crews on all trains.

Proper classification of all types of oil transported by train is necessary

Misclassification of train car contents due to mislabeling by shippers and carriers has caused difficulties for emergency responders. In March 2014 the U.S. DOT issued an Emergency Restriction/Prohibition Order requiring all shippers and carriers to classify all bulk petroleum as the most hazardous packing group. The DOT said, “Misclassification is one of the most dangerous mistakes to be made when dealing with hazardous material because proper classification is a critical first step in determining how to … safely transport hazardous material.” Mislabeling is just as large a problem in Canada. Following the Lac-Mégantic accident, in October 2013, Transport Canada, under Section 32 of the Transport of Dangerous Goods Act, issued a Protective Direction requiring that all persons importing or offering for transport crude oil immediately test the classification. Both countries have found that mislabeling material to be a factor in the magnitude of accidents.

Federal, state and provincial response agencies may not be adequately funded and equipped to efficiently respond to spills from different modes and in all locations

A 2012 report from the Emergency Preparedness Task Force to the Great Lakes Commission identified the need for reliable, consistent and adequate long-term funding for federal, state and provincial agencies to implement and maintain preparedness and response programs. Review of reports released since 2012 suggests that this is still an issue. The 2012 report identified specific priorities including support for training and exercising; inspection and enforcement; research; data collection and reporting; and, conducting risk assessments.

The U.S. Coast Guard has not yet issued final rules on oil pollution prevention necessary to support the development of adequate protocols for marine related incidents

Under the Coast Guard Authorization Act of 2010 the U.S. Coast Guard was to finalize its rulemaking related to oil pollution prevention and barge inspection within 18 months of passage of the Act (i.e., by April 15, 2012) and promulgate regulations to reduce the risk of oil spills during transfer of oil from vessel to tanker vessel. The Coast Guard issued a request for public comments in October 2013 but has not yet proposed a final rule. In addition, a May 2013 audit conducted by the Department of Homeland Security Inspector General concluded that “The USCG does not have adequate processes to investigate, take corrective actions, and enforce Federal regulations related to the reporting of marine accidents.” This stems from a lack of adequate training, retaining properly trained personnel and establishing a complete inspection and review process.

The Great Lakes-St. Lawrence States and Provinces, as well as jurisdictions outside the region, are investigating approaches and developing new policies and programs to address the risks associated with oil transportation.

Government agencies, nongovernmental environmental and citizens groups as well as the oil industry have shown a strong interest in raising awareness to help policymakers better understand the challenges and constraints of moving crude oil from the point of extraction to final destination points. The states and provinces themselves have also been active in considering ways to reduce the risks associated with oil transportation.

At least 10 governmental studies investigating the risks associated with oil transportation have been released since mid-2013 (after the Lac-Megantic incident in Québec) and two of these were major reports issued by state government (California and New York).
The Great Lakes-St. Lawrence States and Provinces can also learn from different approaches being developed by other jurisdictions. Washington State utilizes an innovative strategy to respond to spills under the Vessel of Opportunity (VOO) Program. Alaska has dedicated additional agency resources toward protecting the public and mitigating the effects of oil and hazardous substance releases. Hawaii has designed their own fully equipped training program to respond to oil releases.

- Some mechanisms for communication, coordination and notification between jurisdictions regarding oil transportation and spills currently exist and may be expanded to further enhance preparedness and response in the region.

Communication, including spill notification and coordination of response activities between jurisdictions and different levels of government is extremely important to ensure a timely response in the event of a spill. In its 2012 report to the Great Lakes Commission, the Emergency Preparedness Task Force identified the need to improve communications between jurisdictions and levels of government especially focusing on (and involving) the federal agencies responsible for pipeline permitting and regulations.

Both the U.S. and Canada communicate and coordinate across state, provincial and federal jurisdictions through multiagency teams and through contingency planning efforts that occur across geographic regions and different levels of government including binationally. Regional annexes have been developed under the Great Lakes Water Quality Agreement (GLWQA) to enhance binational communication and coordination. The CANUSLAK Annex deals with the Great Lakes and St. Lawrence River and specifically covers the contiguous waters as defined in the GLWQA.

Article 6 of GLWQA is an important communication tool because it requires notification of planned activities (between the parties) that could lead to a pollution incident or could have a significant cumulative impact on the waters of the Great Lakes. This Article lists oil and gas pipelines and oil and gas drilling as examples of activities that could trigger notification. Moreover, the Agreement leaves open the last clause of actions which trigger notification, saying simply, “other categories of activities identified by parties.” Transport of crude oil by rail or ship could be included under this section if the parties deem appropriate. The states and provinces will benefit by an expanded interpretation of Article 6 and by being included in the notification process.

- Vessel Response Plans (VRPs) required under the Oil Pollution Act (OPA) represents one important component of the U.S. regulatory regime that ensures safe transportation of crude oil by vessel. At present, it is unlikely that VRP requirements could be met for transport of heavy crude oil on the Great Lakes.

Vessel Response Plans are required for all vessels operating in U.S. waters transporting oil as a cargo. These plans, approved by the U.S. Coast Guard under OPA, must meet requirements for the specific geography through which the vessel travels and must include information regarding the resources, methods and techniques that will be used by the shipper for response and recovery in the event of a spill in that setting. According to the Coast Guard, adequate response methods and techniques do not currently exist for spills of heavy oils to open bodies of freshwater such as the Great Lakes. Until adequate methods and techniques can be developed, current VRP requirements would likely preclude the shipping of heavy crude oil by tanker vessel on the Great Lakes.
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3 Based on data from U.S. Energy Information Administration (EIA) and Canadian Association of Petroleum Producers (CAPP).
4 Based on data from the North Dakota Department of Mineral Resources and Canadian Association of Petroleum Producers (CAPP).
5 Based on data from U.S. Energy Information Administration (EIA) and Canadian Association of Petroleum Producers (CAPP), and each refinery website.
6 Based on information from the National Transportation Safety Board (U.S.), Transportation Safety Board (Canada) and a review of news articles.
7 Emergency Preparedness Task Force. Emergency Preparedness and Response Programs for Oil and Hazardous Materials Spills – Challenges and Priorities for the Great Lakes-St. Lawrence River. (Great Lakes Commission, 2012)
12 John Frittelli et al. U.S. Rail Transportation of Crude Oil: Background and Issues for Congress.
13 Based on data from U.S. Energy Information Administration (EIA) and Canadian Association of Petroleum Producers (CAPP)
14 For the number of refineries, the information is based on data from U.S. Energy Information Administration (EIA) and Canadian Association of Petroleum Producers (CAPP); for the capacity, the information is based on each refinery website.
18 John Frittelli et al. U.S. Rail Transportation of Crude Oil: Background and Issues for Congress.
19 John Frittelli et al. U.S. Rail Transportation of Crude Oil: Background and Issues for Congress.
Lac-Mégantic runaway train and derailment investigation summary

This summary of the Transportation Safety Board of Canada’s (TSB) Railway Investigation Report R13D0054 contains a description of the accident, along with an overview of the analysis and findings, the safety action taken to date, five key recommendations, and what more needs to be done to help ensure an accident like this does not happen again.
The accident

On the evening of July 5, 2013, at about 10:50 p.m., a Montreal, Maine & Atlantic Railway (MMA) train arrived at Nantes, Quebec, carrying 7.7 million litres of petroleum crude oil in 72 Class 111 tank cars. Originating in New Town, North Dakota, these were bound for Saint John, New Brunswick.

In keeping with the railway’s practice, after arriving in Nantes, the locomotive engineer (engineer) parked the train on a descending grade on the main track. A replacement engineer was scheduled to continue the trip east in the morning.

The engineer applied hand brakes on all five locomotives and two other cars, and shut down all but the lead locomotive. Railway rules require hand brakes alone be capable of holding a train, and this must be verified by a test. That night, however, the locomotive air brakes were left on during the test, meaning the train was being held by a combination of hand brakes and air brakes. This gave the false impression that the hand brakes alone would hold the train.

The engineer then contacted the rail traffic controller in Farnham, Quebec, to advise that the train was secure. Next, the engineer contacted the rail traffic controller in Bangor, Maine, who controls movements for the crews east of Lac-Mégantic. During this conversation, the engineer indicated that the lead locomotive had experienced mechanical difficulties throughout the trip, and that excessive black and white smoke was coming from its smoke stack. Because they expected the smoke to settle, it was agreed to leave the train as it was and deal with the situation the next morning.

Shortly after the engineer left, the Nantes Fire Department responded to a 911 call reporting a fire on the train. After shutting off the locomotive’s fuel supply, the firefighters moved the electrical breakers inside the cab to the off position, in keeping with railway instructions. They then met with an MMA employee, a track foreman who had been dispatched to the scene but who did not have a locomotive operations background.

Once the fire was extinguished, the firefighters and the track foreman discussed the train’s condition with the rail traffic
controller in Farnham, and departed soon afterward. With all the locomotives shut down, the air compressor no longer supplied air to the air brake system. As air leaked from the brake system, the main air reservoirs were slowly depleted, gradually reducing the effectiveness of the locomotive air brakes. Just before 1 a.m., the air pressure had dropped to a point at which the combination of locomotive air brakes and hand brakes could no longer hold the train, and it began to roll downhill toward Lac-Mégantic, just over seven miles away.

As it moved down the grade, the train picked up speed, reaching a top speed of 65 mph. It derailed near the centre of the town at about 1:15 a.m.

Aftermath and emergency response

Almost all of the 63 derailed tank cars were damaged, and many had large breaches. About six million litres of petroleum crude oil was quickly released. The fire began almost immediately, and the ensuing blaze and explosions left 47 people dead. Another 2000 people were forced from their homes, and much of the downtown core was destroyed.

The pileup of tank cars, combined with the large volume of burning petroleum crude oil, made the firefighters’ job extremely difficult. Despite the challenges of a large emergency, the response was well coordinated, and the fire departments effectively protected the site and ensured public safety after the derailment.
**Fire in the locomotive**

In October 2012, eight months before this accident, the lead locomotive was sent to MMA’s repair shop following an engine failure. Given the significant time and cost of a standard repair, and the pressure to return the locomotive to service, the engine was repaired with an epoxy-like material that lacked the required strength and durability. This material failed in service, leading to engine surges and excessive black and white smoke. Eventually, oil began to accumulate in the body of the turbocharger, where it overheated and caught fire on the night of the accident.

**Braking force**

The *Canadian Rail Operating Rules* required that unattended equipment be left with a “sufficient” number of hand brakes applied to prevent movement, and that the effectiveness of the hand brakes be tested. MMA’s rules called for a minimum of nine hand brakes for a 72-car train. These rules also required that a train’s air brake system not be depended upon to prevent an undesired movement.

Even more crucial is the requirement to test the effectiveness of the hand brakes. That night, the engineer carried out the hand brake effectiveness test with the locomotive air brakes still applied. As a result, the test did not identify that an insufficient amount of hand brake force had been applied to secure the train.

The TSB concluded that, without the extra force provided by the air brakes, a minimum of 17 and possibly as many as 26 hand brakes would have been needed to secure the train, depending on the amount of force with which they had been applied.
Air brakes 101

Trains have two types of air brakes: automatic brakes and independent brakes.

Automatic air brakes are used to slow or stop the entire train, and are controlled by means of a brake pipe connected to each car and locomotive. Decreases in pressure within this pipe cause air to flow into each car’s control valve, which injects stored air into the brake cylinder, applying the brake shoes to the wheels.

By contrast, independent air brakes are available only on locomotives. They are activated by the direct injection of air into their brake cylinders, which then apply the brake shoes to the wheels.

Both independent brakes and automatic brakes are supplied with air from a compressor on each locomotive. When a locomotive is shut off, the compressor no longer supplies the system with air.

When air leaks from the various components, the pressure in the brake cylinders gradually drops, and the amount of force being applied to the locomotive wheels by the independent brakes is reduced. Eventually, if the system is not recharged with air, the brakes will become ineffective and provide no braking force.

When the air brake control valves sense a drop in pressure in the brake pipe, they are designed to activate the brakes on each car. In this accident, however, the rate of leakage was slow and steady—approximately 1 pound per square inch per minute—and so the automatic brakes did not apply.

Hand brakes 101

In addition to air brake systems, all locomotives and rail cars are equipped with at least one hand brake. This is a mechanical device that applies brake shoes to the wheels to prevent them from moving.

The effectiveness of hand brakes depends on several factors, including their age, their maintained condition, their application in conjunction with air brakes, and the force exerted by the person applying the hand brake, which can vary widely.
All 72 tanks cars were Class 111, manufactured between 1980 and 2012. Although they met requirements in effect at the time, they were built to an older standard, and they lacked enhancements such as a jacket, a full head shield, and thermal protection.

Almost every car that derailed was breached, some in multiple areas, including shells, heads, top and bottom fittings, and pressure relief devices. The exact location and extent of the damage varied depending on the orientation and speed of the cars during the derailment.

When the tank cars were breached, the petroleum crude oil was released, fuelling the fire. The damage to the tank cars could have been reduced by enhanced safety features. This is why the TSB called for tougher standards for tank cars carrying flammable liquids.
An organization with a strong safety culture is generally proactive when it comes to addressing safety issues. MMA was generally reactive. There were also significant gaps between the company’s operating instructions and how work was done day to day. This and other signs in MMA’s operations were indicative of a weak safety culture—one that contributed to the continuation of unsafe conditions and unsafe practices, and significantly compromised the company’s ability to manage risk.

When the investigation looked carefully at MMA’s operations, it found that employee training, testing, and supervision were not sufficient, particularly when it came to the operation of hand brakes and the securement of trains. Although MMA had some safety processes in place and had developed a safety management system in 2002, the company did not begin to implement this safety management system until 2010—and by 2013, it was still not functioning effectively.

For several years, Transport Canada’s regional office in Quebec had identified MMA as a company with an elevated level of risk that required more frequent inspections. Although MMA normally took corrective action once problems were identified, it was not uncommon for the same problems to reappear during subsequent inspections. These problems included issues with train securement, training, and track conditions. Transport Canada’s regional office in Quebec, however, did not always follow up to ensure that these recurring problems were effectively analyzed and that the underlying conditions were fixed.

In addition, although MMA had developed a safety management system in 2002, Transport Canada’s regional office in Quebec did not audit it until 2010—even though this is Transport Canada’s responsibility, and despite clear indications (via inspections) that the company’s safety management system was not effective. Transport Canada Headquarters in Ottawa, meanwhile, did not effectively monitor the Region’s activities. As a result, it was not aware of any weaknesses in oversight of regional railways in Quebec, and it did not intervene.
Single-person crews

The TSB looked very carefully at single-person train operations, and at whether having just one crew member played a role in the accident. After looking at the circumstances that night, the investigation was not able to conclude that having another crew member would have prevented the accident.

However, there are some clear lessons for the system. If railways in Canada intend to implement single-person train operations, then they need to examine all the risks and make sure measures are in place to mitigate those risks. Transport Canada, for its part, should consider a process to approve and monitor the railways’ plans so as to assure safety.

Dangerous goods: Inadequate testing, monitoring, and transport

The petroleum crude oil in the tank cars was more volatile than described on the shipping documents. If petroleum crude oil is not tested systematically and frequently, there is a risk of it being improperly classified. The movement of these improperly classified goods increases the risk to people, property, and the environment. That is why the TSB issued a safety advisory letter calling for changes.

Safety action following the accident

In the weeks and months after the accident, the TSB communicated critical safety information on the securement of unattended trains, the classification of petroleum crude oil, rail conditions at Lac-Mégantic, and the employee training programs of short line railways.

MMA, meanwhile, eliminated single-person train operations, stopped moving unit trains of petroleum crude oil, and increased operating-rules testing and enforcement.

For its part, Transport Canada introduced numerous initiatives, including an emergency directive prohibiting trains transporting dangerous goods from operating with single-person crews. Sections of the Canadian Rail Operating Rules were also rewritten, and new tank car standards have been proposed.

Considerable action was also undertaken in the United States. The National Transportation Safety Board issued recommendations aimed at route planning for hazardous materials trains, petroleum products response plans for worst-case spills, and the classification of hazardous materials. The U.S. Department of Transportation also issued an emergency order strengthening train securement rules, and a notice of proposed rulemaking targeting, among other items, improved tank car standards.
In January 2014, the TSB made three recommendations aimed at addressing systemic safety issues that posed a significant risk. Three months later, it followed up to assess the action that had been taken by government and industry. In August 2014, the TSB made two additional recommendations.

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<th>Recommendation</th>
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<td><strong>R14-05 (August 2014)</strong>&lt;br&gt;Transport Canada must take a more hands-on role when it comes to railways’ safety management systems—making sure not just that they exist, but that they are working and that they are effective.</td>
<td>NEW</td>
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<td><strong>R14-04 (August 2014)</strong>&lt;br&gt;Canadian railways must put in place additional physical defences to prevent runaways.</td>
<td>NEW</td>
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<td><strong>R14-03 (January 2014)</strong>&lt;br&gt;Emergency response assistance plans must be created when large volumes of liquid hydrocarbons, like oil, are shipped.</td>
<td>Fully Satisfactory (June 2014)</td>
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<td><strong>R14-02 (January 2014)</strong>&lt;br&gt;Railway companies should conduct strategic route-planning and enhance train operations for all trains carrying dangerous goods.</td>
<td>Satisfactory Intent¹ (June 2014)</td>
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<td><strong>R14-01 (January 2014)</strong>&lt;br&gt;Enhanced protection standards must be put in place for Class 111 tank cars.</td>
<td>Satisfactory in Part² (July 2014)</td>
</tr>
</tbody>
</table>

¹ Railways must make progress on the development and implementation of new rules to improve their operating practices for the safe transportation of dangerous goods.

² Although progress has been made, more work is required. All older Class 111 tank cars must not transport flammable liquids, and a more robust tank car standard with enhanced protection must be set for North America.
Investigations conducted by the TSB are complex—an accident is never caused by just one factor. This report identifies **18 distinct causes and contributing factors**, many of them influencing one another.
... Findings

This report also contains 16 findings as to risk. Although these did not lead directly to the accident, they are related to unsafe acts, unsafe conditions, or safety issues with the potential to degrade rail safety. Some of the risks that need to be addressed are:

- the continuing risk of leaving trains unattended
- the risk of implementing single-person train operations
- the risk of not systematically testing petroleum crude oil
- the risk of not planning and analyzing routes on which dangerous goods are carried
- the risk of not having emergency response assistance plans in place
- the risk of Transport Canada not ensuring that safety management systems work effectively

Conclusion

The tragedy in Lac-Mégantic was not caused by one single person, action or organization. Many factors played a role, and addressing the safety issues will take a concerted effort from regulators, railways, shippers, tank car manufacturers, and refiners in Canada and the United States. Although this investigation is complete, the TSB will continue to monitor the five recommendations, and to report publicly on any progress—or lack of progress—until all of the safety deficiencies have been corrected.
Speaker Topics

Under this tab are background materials provided to inform the panel discussions:

- Background on Invasive Mussel Control Collaborative for the Great Lakes
- Factsheet on Buffalo River Restoration Partnership
- Mark Schollen presentation abstract: *The Transformative Potential of Waterfront Revitalization*
Invasive zebra and quagga mussels (Dreissena polymorpha and D. rostriformis bugensis, respectively) are causing significant ecological and economic damage as they spread from the Great Lakes across North America, from the Hudson River in the east to Lake Mead in the west. They clog water intake pipes, litter beaches with their sharp shells, disrupt established food webs, alter nutrient cycling in a way that harms native ecosystems, and contribute to other problems. The negative environmental and economic impacts of these dreissenid mussels drove scientists to search for control methods beginning in the early 1990s. That search took a dramatic step forward when scientists from the New York State Museum Field Research Laboratory discovered that the killed-cells of a specific strain (CL145A) of a common soil bacterium, Pseudomonas fluorescens, caused mortality in dreissenid mussels with minimal non-target animal impacts. A second dramatic step forward was the registration and approval by the U.S. Environmental Protection Agency of the commercial product Zequanox® (containing P. fluorescens CL145A as the active ingredient) for use in open water environments. Though Zequanox® represents a potential game-changing tool, knowledge gaps need to be addressed before managers are likely to implement an effective integrated pest management program (IPM) to control invasive mussels. Additional investigation is needed to address uncertainties in the use of Zequanox®, such as potential effects on invertebrates and ecosystems, optimal application procedures, and others. The coordinated and integrated application of several different control tools has been proven to yield the most effective control strategy. Consequently, ongoing research should be continued to identify the next set of control tools (e.g., spawning inhibitors and microparticles to target control agent delivery). Finally, managers need to identify restoration objectives associated with controlling invasive mussels. Ideally, managers and scientists would have a forum in which to communicate and coordinate this work using an iterative and collaborative process.

**A Collaborative Approach**

Establishing an Invasive Mussel Control Collaborative for the Great Lakes and St. Lawrence River region will provide a much needed framework for communication and coordination to advance effective control strategies for dreissenid mussels. This approach can help identify the needs and objectives of resource managers, prioritize the supporting science, recommend communication strategies and ultimately align science and management goals into a common agenda.

The Great Lakes Commission and Great Lakes Fishery Commission, key regional agencies working with resource managers, will coordinate and provide a neutral backbone for the collaborative. The U.S. Geological Survey and National Oceanic and Atmospheric Administration will help facilitate science in support of management needs. A broad membership base of states, provinces, tribal and other entities and a well-organized communication network will facilitate the exchange of information between scientists, managers and stakeholders, and provide ongoing guidance and feedback within an adaptive management framework. Strong connections with other regions will be developed and will provide a framework for application elsewhere.

**Invasive Mussel Control Collaborative**

**Membership**
- U.S. and Canada
- Federal, Tribal, state and provincial agencies
- Nongovernment organizations
- Industry
- Academia

**External Connections**
- Local groups (e.g., lake associations)
- Other regional groups (e.g., Western U.S.)
- Other national and international stakeholders

**Coordinators**
- Great Lakes Commission
- Great Lakes Fishery Commission
- National Oceanic and Atmospheric Administration
- U.S. Geological Survey
Preliminary science priorities. The categories and priorities are expected to flex as the collaborative process matures and updates critical management objectives and science information gaps.

**Identify and align management objectives and science priorities**

- Develop and guide a comprehensive Integrated Pest Management (IPM) program for invasive mussels
  - Facilitate information exchange between scientists, managers and stakeholders
  - Establish a common agenda for an IPM program

**Implement communication and outreach activities**

- Communicate science and management priorities
- Provide information to stakeholders
- Establish national connections and relationships with other regions

**Invasive Mussel Control Collaborative**

**Develop and refine control strategies**

- Optimize Zequanox® application procedures
- Continue development of additional control tools
- Assess and understand the direct effects of control strategies, including Zequanox®, on native and non-target species

**Conduct assessments to understand ecosystem effects of control**

- Design an adaptive management control experiment for a Great Lakes site
- Conduct pre- and post-treatment monitoring

**Develop models and decision support tools**

- Develop population models for quagga mussels
- Predict how dreissenid population growth would vary with respect to different control strategies
- Develop models to assess effects of varying levels of control on ecosystem services, including risk assessments for an IPM program
Since 2011, the Buffalo River Restoration Partnership has dredged and capped about 1 million cubic yards of contaminated sediment in the river, taking pollution out of the food chain and creating a healthier river for all. As dredging, capping, and fish structure installation finish up this winter, crews look to the summer to install river-bottom plants.

Did You Know?

- One million cubic yards of dredged sediment could fill a football field over 40 stories high!
- Mink, great blue herons, turtles, river otters, pumpkinseed, and largemouth bass can be found in and around the Buffalo River.
- The average Buffalo resident uses 115 gallons of water each day.
- Bowling balls, cars, anchors, fancy vases, and a glass eye have all been dredged from the river.

The Buffalo River Restoration Partnership is a public-private collaboration to clean up sediment and restore habitat in the Buffalo River. Discharges of toxic chemicals and heavy metals to the Great Lakes have greatly decreased in the last 40 years, and efforts like the BRRP are helping to undo the damage from decades of historic industrialization and municipal practices.

**Buffalo River Restoration Partnership (BRRP)**

- U.S. Environmental Protection Agency
- U.S. Army Corps of Engineers
- New York State Department of Environmental Conservation
- Erie County
- City of Buffalo
- Honeywell
- Buffalo Niagara Riverkeeper
- Sea Grant

The Great Lakes Legacy Act remediation and the Army Corps navigation dredging was performed with funding from the Great Lakes Restoration Initiative and Energy & Water Development.

BuffaloRiverRestoration.org
"We see the benefits of western New York’s proximity to freshwater growing at a rapid pace, and this project is essential to sustaining that momentum. Restoring the Buffalo River makes sense environmentally and economically."

– U.S. Congressman Brian Higgins, 2013

**Buffalo River past, present, and future**

When industrial business was booming, freighters passed under the Michigan Street Bridge carrying assorted goods manufactured in Buffalo, from steel to dye to lumber.

Sand is spread, capping the City Ship Canal to provide clean habitat for bottom-dwelling critters that form the base of the river’s food web.

Native sedges, rushes, and flowering plants will be installed in the river to provide new habitat at the five restoration sites numbered on the map.

Dredging removes contaminated sediment from the river and is shipped to the Confined Disposal Facility for long-term, safe containment.

Looks can be deceiving. In this postcard-like view captured before dredging, contaminated sediment was lying under water, out of sight.

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**Buffalo River Restoration**

- **Legacy Act Dredging**
- **Capping**
  - City Ship Canal
  - Ohio Street Shoreline
  - Katherine Street Peninsula
- **Habitat Restoration in Water**
  - Buffalo Color Peninsula
  - Riverbend

*USACE dredging (navigation channel) not shown.*
WATER, MICHIGAN AND THE GROWING "BLUE ECONOMY"

JOHN AUSTIN
Director, Michigan Economic Center at Prima Civitas
Non-Resident Senior Fellow, Brookings Institution
President, Michigan State Board of Education

WHITE PAPER COMMISSIONED BY:
Governor’s Office of the Great Lakes for Michigan’s Water Strategy
Jon Allan, Director
Overview

As the Great Lakes State, with abundant natural water assets, Michigan’s very identity and our economic and cultural history has been shaped by water. Our waterways were first the conduit to explore and settle the region; and ship our natural bounty, pelts, timbers, ores and grains to growing markets. As we converted this bounty to grow and make things, water was the key ingredient in the great industries built in the region. Agriculture, autos, paper, chemicals, durable goods manufacturing, all used -- and often abused -- our water as an input to the agri-industrial economy that powered Michigan’s might in the 20th century.

In the latter part of the 20th century Michigan led the way in cleaning up our water, repairing damage and excesses from the factory era. We newly appreciated that our water matters enormously to the health of our overall Michigan ecosystem and our economy; but also as a rare and precious part of human use and enjoyment. Michigan has over 3,000 miles of freshwater coast, 11,000 inland lakes, hundreds of beautiful rivers, and wetlands, which make it a magical place to live, work, and play. “Pure Michigan” speaks so powerfully to us, as it captures the joy our waters bring Michigan families (and our many visitors), when we spend time at the cottage, fish the river, walk the dune, watch the sunset, or pilot our boat.

Today our water still matters to our Michigan economy in traditional ways:

• Conduit for commerce: commercial and freight shipping and warehousing, as well as travel by water, remain an important part of Michigan’s economy.

• “Input” and resource to grow and make things: Water is an essential input to farming and agriculture, manufacturing, energy production, and most things we make and use.

• Magical place-definer and quality of life enhancer: People want to live near water, to see it, and enjoy it -- boat, swim, fish, and walk along it. Why do people like to live near and visit “coasts”? We will pay more for a room or house, cottage or office with a water view. Water is a quality of life and place-defining asset. And there is no place like Michigan and our Great Lakes for enjoying the water that is at the heart of the blue economy -- if it is clean and accessible.

But water is also central in new ways to a more vibrant economic future. Water is a tool and asset that, if leveraged, can stimulate new economic activity, job growth, and talent attraction and retention.
The new and growing ways water matters to our economy include:

- **Water Technology Business**: Smart and sustainable water use and re-use, water efficiency, cleaning, and many other new water-technology products and services are an exploding multi-billion dollar business opportunity—and a huge opportunity for Michigan firms and entrepreneurs with competencies in innovating, deploying, and manufacturing new products. Michigan firms like Cascade Engineering, Dow Chemical, Limnotech, and many others are demonstrating there is money to be made and jobs to be created in new clean-tech, smart water technology and products.

- **Water Research and Learning**: Michigan’s schools and universities, as they solve water problems for Michigan, the Great Lakes, and the world, can be the places top talent, students and research dollars pour into—and new inventions and businesses spill out. Education and research institutions engaged in water research, water and ecosystem management and education, pioneering solutions to global water problems, educating and training water “talent” – are an economic engine in and of themselves. They work to attract outside investment, keep and draw top talent to Michigan, and create “spillovers” in the form of new technologies, firms and enterprises. Developing water centers of excellence is a huge economic opportunity just beginning to be exploited by our world-leading education and research institutions.

- **Sustainable Water Use as Values Cue**: By being the leader, the innovator in sustainable water use and water stewardship we also send an important values cue: Michigan and our communities are the place where we take good care of our beautiful water, and are solving the world’s water problems. This message is a magnet for today’s top talent, particularly young people—who want a sustainable lifestyle, who want to live and work in communities and for companies that are committed to sustainability, and who want to be engaged in solving big, important problems that make the world, and their corner of it—better.

- **Water as Long-Term Sustainable Growth Platform**: And in the long-run, Michigan, along with sister states surrounding the Great Lakes, is one of the few places on earth that can provide a sustainable platform for long-term population and economic growth. Sometime in the near future—particularly if the rest of the country and world begin to price water to reflect its costs, and Michigan demonstrates and grows its sustainable water use practices, there will be a new migration of people and companies to Michigan and the Great Lakes—simply because they need water that can be used and re-used sustainably. This movement may have already begun.

Any water strategy for Michigan must focus on all these important ways our rich water and innovation assets can be best leveraged to drive a new round of job and wealth creation in Michigan. Michigan has a unique opportunity to become a leader in this emerging “Blue Economy”, using water in smart and sustainable ways, solving global water problems, and leveraging unique water assets for economic and community development.
Understanding Michigan’s Blue Economy

To understand the “Blue Economy” it is helpful to reflect on the analogous and intertwined “Green Economy” that we have come to appreciate and attempt to nurture in recent years. Just as we now understand that there are tangible “green” economy opportunities: renewable energy products, energy conservation in our homes, communities and businesses; making more attractive communities by providing green space and parks; choosing “green” practices and products as lifestyle choices…there is a similar “Blue Economy”: saving water, using it smarter in our communities, homes, businesses, appliances; purifying and using water more efficiently around the world; cleaning and providing public access to our lakes and rivers that make beautiful places to live, work, and recreate. People want to be near water as a lifestyle choice; choosing “sustainable” products and using water more sustainability is a values statement people want to make.

How Water Matters to the Economy - Today

Michigan’s water still matters significantly to our economy in its historic and traditional ways as a conduit for commerce, and a resource and “input” in growing and making things:

• Water and our Great Lakes are still conduits for shipping, trade and commerce. Estimates are that Great Lakes shipping, freight/commercial traffic and warehousing are responsible for over 65,000 jobs and $3.3 billion in annual wages.¹

• Michigan has over 660,000 jobs, and $49 billion in annual wages directly linked to using our Great Lakes water for farming, in manufacturing, mining and energy production.²

These will remain important parts of Michigan’s water-based economy, particularly if Michigan can lead in innovation in how water is used in agriculture and manufacturing more efficiently and sustainably, and to mitigate environmental damage. However, these are not today the most important ways water matters to the economy, nor are they the areas of most rapid job and economic growth, and future opportunity.

By understanding the growing ways water matters—and accelerating Michigan’s work and leadership in each of these areas—Michigan can reap significant economic dividends. Table 1 categorizes the economy and job creation impacts around the emerging Blue Economy. While impossible to quantify all the economic impacts and opportunities in this growing arena, a conservative estimate is that water is already responsible for nearly a million jobs and $60 billion in the Michigan economy.³

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³. MEC estimate from existing studies and original research.
Table 1. The Emerging Blue Economy – Job Impacts

**New Clean-Tech, Smart Water Technology Jobs**

**Water Technology Research, Learning, and Water-Technology Goods and Services Production:** Communities that are centers of basic and applied water research, and the development of new water technologies will see concentrations of highly educated talent, institutions and firms around water conservation and cleaning systems; treatment and wastewater recovery (from phosphates to methane); water efficiency techniques in manufacturing, mining and agriculture; water quality testing; water technology validation and permitting, water pricing and management technologies, ecosystem engineering, design and building services; water and sewer infrastructure engineering and redesign, water loss management detection and recovery; brown-fresh water separation; aquaculture, agriculture, and freshwater marine life research; and water ecosystem teaching and learning centers of excellence.

**Direct “Blue-Collar” – “Blue-Economy” Jobs From Deploying New Systems and Technologies**

**Water Products, Sustainability System-Building and Applications:** New jobs will be created in constructing and deploying blue sustainability systems and practices in housing, buildings, and retrofitting of water systems; manufacture of water pumps, desalinization equipment, water infrastructure modernization and repair; installing new efficient smart-water, brown water, treatment systems; water cleaning “living machines” design/installation; design/construction of homes and buildings; and agriculture equipment component making; aquaculture, fishing, agriculture, habitat management, and construction will benefit with job growth.

**Water-Based Development**

**Place Making Economic and Job Creation Impacts:** There are tremendous economic development benefits, and jobs flowing from new water related access, use and supporting infrastructure. Water is a valuable amenity—places on the water, near the water, where people can see and enjoy rivers, lakes and streams—are valuable pieces of real estate. Waterfront reclamation, water-based development (parks, marinas, residential and office units adjacent) lake, beach and riverfront access and preservation, access to water for healthy, outdoor lifestyles, and water sports (including new water trails, way-findings applications), water-based activity from fishing, boating, and birding, all provide direct economic benefits as well as shape place and provide amenity benefits, that create conditions for additional-market driven economic growth.

**Long-term Sustainable Platform**

Water availability at reasonable cost for use (and reuse) makes Michigan a long-term platform for population and economic growth. As water becomes priced more accurately (like energy) it will drive development to locales where water can be sustainably used.

**Values-Culture-Lifestyle- Economic Impacts**

Leadership in building sustainable communities puts in place vital amenities, sends community values and lifestyle signals that attract and keep talented, educated entrepreneurs, citizens and consumers — who value stewardship of natural assets, choose healthy and sustainable products and lifestyles, and value the ethic of sustainability.
The Race to Realize Blue Economy Leadership

It is also important to understand that Michigan—blessed with perhaps some of the world’s greatest freshwater, and water research and innovation assets—is not alone in working to seize ‘blue economy’ leadership, and win the benefits in job and talent growth.

Globally, Singapore, Australia, Israel and the Netherlands are turning water challenges to opportunities, and building aggressive water conservation, management and water technology business development strategies. Across Lake Michigan, Milwaukee is developing as a global water center; with a three-legged stool of supporting innovation and growth in their cluster of 130 plus water technology businesses, expanding their University of Wisconsin-Milwaukee and Marquette University water research and education programs; and enhancing their waterfront development and promotion efforts. Across Lake Erie, Cleveland has initiated the Alliance for Water Future to make Cleveland home to freshwater innovation and new business and is seeking to turn its Great lakes Science Center into a water education center. Our Great Lakes neighbor Ontario, and in fact all of Canada have a robust “Blue Economy” Initiative to build leadership in freshwater technology research and business development.

If anything Michigan needs to catch-up and leapfrog states and communities vying for the prize of water technology, research and education leadership, and who are marketing their water-based natural assets and sustainability/lifestyle “brand”.

Opportunities and Challenges in Leveraging Water for Economic Growth

In each of these major emerging domains that make up the “Blue Economy” there is a lot of activity and innovation going on in Michigan—and both tremendous opportunity and challenges to overcome.

Water as Place Definer: Use and Enjoyment

There is only so much waterfront real estate, and Michigan’s 3,000-plus miles of Great Lakes freshwater coast; 11,000 inland lakes, hundreds of rivers, and wetlands make it a beautiful, magical place to live and work: if the water is clean, and lakes, beaches, are accessible. People like to live, work, and play near water; to sit at a restaurant, watch birds, fish, swim, boat, enjoy a sunrise, or sunset over water. This is all possible if there is public access, if water is clean, if we remove the slag piles, and rusting factories, and allow for beaches, parks and wetlands to be protected, improved and expanded; and walkways, marinas, and new commercial, and residential developments to be facilitated.

The starting point is water restoration. Studies by the Brookings Institution and Grand Valley State University showed a 3:1 and 6.6:1 return on investment, respectively, in the form of increased property

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6. Canada as the Water Solutions Country, Defining the Opportunities, David Crane 2013
values and local economic development from restoring water quality and shoreline. Major dividends in the form of attracting new residents, tenants and visitors, come from healthy water ecosystems, coastlines and the many environmental and aesthetic benefits that these provide. There is substantial evidence in the economics literature documenting that people are willing to pay more to locate in areas with high environmental quality.\textsuperscript{7} Home values differ within and across metropolitan areas, with residents paying more to live in areas with parks and open spaces, lakes, rivers, wetlands, good air quality, and other environmental amenities.\textsuperscript{8} At the same time, residents of environmentally attractive areas actually enjoy higher real wages (current wages adjusted for inflation).\textsuperscript{9} Our Brookings Institution report Healthy Waters, Strong Economy estimates the water clean-up and restoration activities in the greater Detroit Metro area alone (if and when fully implemented) can drive a $3.7-$7 billion increase in property values and long-run economic development.\textsuperscript{10} Already Michigan has received $163 million in federal Great Lakes Restoration funding to compliment state and local funds. A Brookings Institution study shows a conservative $3 to $1 economic multiplier yields a $500 million economic impact for Great Lakes Restoration funding to date.

In addition to long-term benefits of healthy waters, we know today these waters attract visitors and accelerate community population growth and generate economic activity. Recreational boaters direct and indirect spending is $3.9 billion in Michigan, contributing to over 50,000 jobs.\textsuperscript{11} Michigan anglers contribute $2 billion annually to the state.\textsuperscript{12} Coastal tourism from birding to beach visits is responsible for 57,000 jobs and $955 million in earnings every year.\textsuperscript{13} Recreation and tourism spending around inland lakes, rivers and wetlands has not been estimated but arguably would be a comparable or larger amount. We do know that the small, but growing Michigan canoe and kayaking industry already contributes $140 million a year to the economy.\textsuperscript{14} All these numbers improve as watersheds are restored, Michigan waters are cleaned up and protected—which leads to tangible economic payoffs in greater fish abundance, reduced beach closures and water treatment costs, improved water clarity, and better wildlife habitat.\textsuperscript{15}

Acting on this opportunity, communities around Michigan are participating in significant water cleanup and ecosystem restoration activities; and are advancing new community development visions around their water assets, marketing and leveraging water access as an important quality of life attribute:

- Macomb County’s Blue Economy initiative is working to brand and celebrate Macomb’s access to water and recreation as a community selling point; restoring and increasing public access to key stretches of waterfront and wetland; developing water trails and promoting water recreation business.

\textsuperscript{7} Jennifer Roback “Wages, Rents and Quality of Life”, Journal of Political Economy (90) 1982
\textsuperscript{9} For example, one recent study found that living 100 miles closer to a national park is equivalent to a wage increase of 4 percent, holding housing prices constant: Paul Courant and Lucille Schmidt, “Sometimes Close is Good Enough”, Journal of Regional Science (46) (5) (2004)
\textsuperscript{10} Place-Specific Benefits of Great Lakes Restoration, Austin, Anderson, Courant, (2008)
\textsuperscript{11} Great Lakes Recreational Boating’s Economic Punch, Great Lakes Commission, 2012
\textsuperscript{12} State rankings compiled by Michigan DNR (2009), cited in Michigan’s Great Lakes Jobs, Michigan Sea Grant, Vaccaro, Read, Scavia 2010.
\textsuperscript{13} Michigan’s Great Lakes Jobs, Michigan Sea Grant, Vaccaro, Read, Scavia 2010.
\textsuperscript{14} Great Lakes Recreational Boating’s Economic Punch, Great Lakes Commission, 2012
\textsuperscript{15} Michigan’s Economic Vitality: The Benefits of Restoring the Great Lakes; Vaccaro, Scavia et all 2010.
• Waterfront redevelopment and water restoration and cleanup in Muskegon and Marquette harbors and along the Detroit Riverfront is repositioning these communities and contributing to market-driven growth.
• The Huron “Riverup” initiative is transforming the 100 miles of Huron River from a neglected “backyard” and dumping ground to a destination and center of community life: with clean-up and restoration efforts, access improvements, water trail development, marketing, and even “art on the river” projects.
• Putting the rapids back into the Grand River, and enhanced public waterfront access and surrounding development in Grand Rapids is contributing to the impressive revitalization of the urban core.
• In Alpena, the nation’s only freshwater National Marine Sanctuary and its expansion from 448 square miles to 4,300 square miles, protecting precious Great Lakes shipwrecks and history, is a fulcrum attracting visitors, and year-round residents.
• Kayak and canoe water trails are being developed and promoted around the state to enhance recreation and tourism; many accessed and promoted by new social media web and apps information – developed through new public-private collaboration.

State water strategy can further identify and promote development of public-private water development policies and practices; sharing ideas, information and best practices among Michigan communities, and identifying the strategic initiatives and interventions most critical to accelerate water place-making strategy.

**Water technology business**
MEDC reports over 350 emerging water technology firms in Michigan today. In addition, Michigan has a tremendous water innovation infrastructure, as home to firms with strong competencies in discovering, deploying and manufacturing sophisticated products, and providing water engineering, clean-up and ecosystem services. From this base Michigan is well positioned to develop, build, and export new smart-water products and services and participate in the growing multi-billion dollar global business marketplace:

• Michigan firms are already identifying and exploiting new global markets for water products like Cascade Engineering in water cleaning and Dow Chemicals in water filtering.
• Companies like GM, Chrysler, Ford, Masco, PVS Chemical, BASF, Nichols paper utilities DTE and Consumers Energy are all advancing water conservation and treatment tools and technologies.
• Water and ecosystem service firms like Limnotech Engineering, ASTI Environmental, Environmental Consulting and Technology Inc. (ECT) are building on work and expertise gleaned from cleaning up Michigan and Great Lakes water, to new work redeveloping water ecosystems -- from Belle Isle in Detroit, and Lake St. Clair in Macomb County -- to other states, and international clients, including nearby Toronto, and far away China and India.

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17. As in www.michiganwatertrails.org developed by the State DEQ, Michigan Sea Grant and Land Information Access Association (LIAA), and www.huronriverwatertrail.org
18. Gil Pezza, MEDC, conversation with author.
• The MEDC and other third sector investors are supporting new water technology firms like a Swedish BioGas venture that extracts energy from municipal wastewater in Flint, and a firm that converts wastewater into ethanol and chemicals for reuse in Alpena.
• Public-private-third sector partnerships like that between Sustainable Water Works, Limnotech, and the Nature Conservancy, are developing new technologies to reduce nutrient loads from farm lands into Lake Erie.
• Entrepreneurs are developing smart phone apps for way-finding and to promote recreation on Michigan’s burgeoning watertrail network. 19
• A number of efforts and initiatives to catalyze new commercial opportunities in water technology business are also at work: H2O Opportunities is developing new technologies and firms from existing water and wastewater management activities; Sustainable Water Works is developing a water technology innovation and commercialization accelerator at Techtown as part of Detroit’s midtown economic development, and managing a business forum to connect and expand knowledge around emerging water technology business opportunities.
• Under the leadership of Governor Rick Snyder, the Great Lakes Governors and Canadian Premiers recently announced the Great Lakes – St. Lawrence River Water Partnership to promote Michigan and the whole region’s water-related companies, to partner and promote internationally the region’s water companies, products and services, expanding trade, and attracting investment.

State water strategy can further identify, with private sector direction and input, the most critical network-building, financing needs, marketing assistance, and related gaps and opportunities; and support public-private partnerships to grow the water technology cluster.

Water research, learning and global problem solving
Michigan has leading education and research institutions with expertise in discovery and innovation around freshwater issues that serve as magnets for talent and emerging centers of excellence around water sustainability. Michigan has nine University Water Research Centers; and growing numbers of environment, ecosystem management, and sustainability programs and courses across its public and private universities and community colleges. These programs on the environment, water and ecosystem management, and sustainability are popular and growing in enrollments at Michigan learning institutions. Michigan’s research institutions are also winning and deploying significant federal and philanthropic grants for water research:

• The University of Michigan recently launched a new $9 million Water Center at the Graham Environmental Sustainability Institute, which included a $4.5 million dollar grant from the Erb Foundation to improve the practice of Great Lakes Restoration. U of M’s Erb Institute also brings its leading business school together with environmental disciplines to forge new clean-tech businesses and train their entrepreneurs.

19. See the iShiawasee App at the Itunes store
• In the Detroit area—Wayne State University is home to leading programs in watershed cleanup and restoration; and the link between energy and water usage; Lawrence Tech is home to the Great Lakes Stormwater Management Institute.

• Michigan Technological University is a center of freshwater research and ecosystem management in the UP. Its newly-opened, multi-disciplinary Great Lakes Research Center (GLRC) is a 50,000 sq. ft., $25M waterfront facility with state of the art laboratories, marine facilities, and a new super computer facility.

• Grand Valley State Universities’ Annis Water Resources Institute in Muskegon has seen its enrollments double over recent years; its research programs are findings ways to use algae for bio-fuels; and develop herbicides that can strategically test and target only invasive species. It’s local direct economic footprint is estimated at $3 million dollars for the Muskegon area economy.

• Michigan State Universities’ Center for Water Science is finding new ways to track and treat pathogens in water; MSU’s specialists in microbiology recently won a $9.1 million grant to identify and treat the water-link in malaria and other diseases that plague the developing world.

• Macomb Community College and Wayne State University are teaming with Macomb County and the Metroparks system in the Huron to Erie Alliance for Research and Training (HEART) Freshwater Center, designed to provide field-based resources, including mobile labs, for students interested in pursuing careers in water-related science and engineering fields; and transfer programs in freshwater-related Biology, Civil & Environmental Engineering, Environmental Science, and Geology that allow students to begin their studies at Macomb and complete at WSU.

• And Northwestern Michigan College created one of the first community college-level Water Institutes, and first associate degree program in Freshwater Studies in the U.S., which prepares a range of professionals for roles in environmental management, hydrology, planning, consulting, environmental and ecosystem services.

Michigan can truly be an international center of education, research, development and production of technologies around smart use of freshwater, with applications in global health, food, energy, water conservation, and sustainable development. Just as our leading research universities once led the Green Revolution; pioneering agricultural practices and products that helped the developing world feed itself—today these same institutions can lead the Blue Revolution— including teaching the world how to feed itself more sustainably, using less water; and solving health, energy and other problems linked to water use.

Sustainable water as values signal
As Michigan, its communities and institutions lead the “Blue revolution” they make a values statement: lots of people want to work on issues of global sustainability, they want to live in communities, buy products, and work in companies that are committed to sustainability and stewardship of the natural world—particularly our beautiful and precious water. Michigan can show this is the place that animates those values of innovation, stewardship and conservation.
Some examples of the importance of these signals:

- When Grand Rapids is awarded the designation America’s “greenest” mid-size city (largely for its smart water use) it adds to its reputation as a community at the forefront of innovation and positive change. Combined with its downtown re-development, and world famous ArtPrize, it sends a strong signal that Grand Rapids is a forward-leaning and progressive community—making it more attractive to talent, and particularly young talent who value these attributes.

- When Cascade Engineering’s VP Christine Keller notes that students and graduates of Grand Valley State University’s Annis Water Resources Institute are tripping over themselves to intern and work at their firm—where among other sustainable products they are making and exporting a water-cleaning device for the third world, that can contribute to ending the health scourge that sees 60% of hospital patients in developing countries there due to water borne pathogens—it demonstrates the power of being the innovators in sustainable water “work” to attract and keep our young talent in Michigan.

- Macomb County is also communicating a new message about itself. Their Blue Economy initiative is part of broader community messaging around “Make your Home in Macomb” – celebrating both the lifestyle benefits of access to water, and the conservation, stewardship, and rehabilitation of Macomb’s Clinton River watershed, and Lake St. Clair water front as core community values.

- Just as Traverse City, which cleaned up the cherry canneries on its waterfront years ago, and has re-made itself as a water-afforded, quality-of-life-driven community that attracts year-round professionals, and tourists—other historic industrial and port cities like Muskegon and Marquette are “rebranding” themselves with the celebration of their water, their outdoor lifestyle, cleaned up waterfronts and the “Blue Economy” at their core—and sending new and exciting messages about their community.

Michigan’s water strategy can support more communities in building sustainable water use and enjoyment into the fabric of daily life; and “rebrand” themselves as the innovators and leaders in clean-tech products, water problem solving, and sustainable living.

**Water as long-term sustainable development platform**

And in the long-run, Michigan is one of the few places that can provide a sustainable platform for long-term population and economic growth. Sometime in the near future—particularly if the rest of the country and world begin to price water to reflect its costs, and Michigan can demonstrate and grow sustainable water use practices, there can be a new migration to Michigan and the Great Lakes simply because people need water that can be used and re-used sustainably. This movement may have already begun-- with global water shortages, Michigan and the Great Lakes can also reap economic advantage as the “Saudia Arabia” of water.  

Priorities for State Water Strategy, Policy, Funding and Practice to accelerate Blue Economy Leadership

There is more research and policy development work to be done to identify specific recommendations around the most powerful state and local, public and private policies and practices central to support the growth of the Blue Economy in Michigan. However, given the opportunities and challenges identified to date, the following are broad recommendations of areas of focus, and potential next steps for Michigan’s developing water strategy in order to accelerate the growth of Michigan’s Blue Economy:

Support local waterfront redevelopment, clean-up, infrastructure and place-making. A prime area of focus can be to assist local communities working to leverage their natural water assets and amenities as part of local community development—and inspire more communities to begin this work. Michigan communities engaged in these efforts face many challenges from costly infrastructure investments to clean water, rebuild wetlands, clean and clear waterfront industrial properties for development; to the protection of scenic parcels, maintenance and expansion of waterfront parks, and enhancing public access through marinas, walkways etc. But many are advancing innovative public-private development and financing strategies, along with community strategic visions, marketing and communications activities, to meet these challenges.

To start, Michigan’s Water Strategy can support and learn from work underway (by the Michigan Economic Center and others) to inventory current community water-based development activity, connect and network practitioners for mutual learning and problem solving, identify where state tools and resources can assist; and share successful community experiences with others to inspire similar work.

Ultimately, this process will lead to more specific recommendations for how local water-based community development efforts could be supported. One idea could be an expanded “Pure Michigan” program or Fund – given the power and appeal of this existing effort. An expanded Pure Michigan could be a vehicle for water asset marketing, branding and communication (selling the Blue Economy); provide resources perhaps on a matching basis for water cleanup; water-related infrastructure investments; community planning, development and communications activities promoting waterfront development. Research also shows the powerful brand of Pure Michigan is broadly supported by the public as a mechanism to raise additional resources for water cleanup, conservation and water-place-making.

Water research and education center-of-excellence building. Given the research and education horsepower around water at Michigan colleges and universities; the growing array of freshwater research and innovation activity underway, and the payoff in terms of talent and dollar attraction, retention and commercial spillovers, the State of Michigan has much to gain by growing and marketing Michigan’s water research/education centers of excellence. There are a variety

of ways the State could provide leadership as well as direct support: Help recruit outside, institutional, philanthropic and private/corporate investors; Expand and support the existing MIEE public university innovation consortia to include water research; Create a state match for competitively won, rigorously vetted federal research (as Indiana does); Incorporate water research centers of excellence into state innovation and commercialization strategy and funding (in a model like Ohio’s successful 3rd Frontier).

**Water innovation network-building and commercialization strategy.**

In Michigan and in other states, in emerging sectors such as energy, life-sciences, and IT -- business affinity organizations, and catalytic organizations that support business acceleration, commercialization, and early stage capital/finance needs have often supported the growth of these new sectors. As seen in the success of initiatives such as the Massachusetts BioTechnology Council, BioEnterprise Cleveland, and Milwaukee’s Water Council there may be a state role in encouraging, and providing seeding support for a business affinity organization, or an accelerator/financing support vehicle for the emerging water sector. The nucleus for these efforts may exist with the work of Sustainable Water Works; H2O Opportunities and others.

There are also many well-intentioned emerging industry support organizations that fail. As Frank Samuel, architect of Ohio’s successful “3rd Frontier” Initiative, and Great Lakes venture capital strategy notes, the key to successful efforts are making sure a) the effort is led/directed by the private sector; and b)any catalytic financing or accelerator organization is staffed by private sector professionals and led with the mission to support firms and their investors to make money and grow their business. 22 A recommended first step is to convene and ask Michigan’s water-based business sector what they need, and what would be helpful to support the growth of Michigan’s water business segments.

**Note on Further Developing Michigan’s Blue Economy Growing Strategy**

The Michigan Economic Center, in partnership with the Grand Valley State University Aniss Water Resources Center, has received a grant from the C.S. Mott Foundation to support the “Growing Michigan’s Blue Economy” initiative, over the next year. The project will convene, network, share information and promising practices, as well as identify additional issues and obstacles to growing Michigan’s Blue Economy, from the array of active community/governmental, business, higher education, and third sector practitioners in Michigan’s Blue Economy.

This work can be a vehicle to inform and further develop the recommendations for the Administration’s water strategy that support blue-economy growth. We are eager to collaborate in this important work.

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Great Lakes Commission Annual Meeting

Presentation Abstract

Principal
Schollen & Company Inc.
Landscape Architect

Presentation Title: The Transformative Potential of Waterfront Revitalization

North Bay is a city that is situated on the shore of Lake Nipissing in Ontario. North Bay is known as “The Gateway to the North” because of its location at the cross roads of Highways 11 and 17 and its former position as a major railway hub connecting Southern Ontario to Northern Ontario and Quebec. The city was established around the railway yards. However, it was these same railway lands that severed the connection between the city and Lake Nipissing. With the decline of the railways, the city embarked on a community-driven initiative to reclaim the railway lands and reconnect the city and the lake. In 2007, the city commissioned the development of a master plan for a new waterfront park that was to be located on the former railway lands. Since the 29 ha site had been contaminated as a result of past use, the master plan was developed in consort with a strategy to reclaim the brownfield site while laying the groundwork for the development of the future park.

The initial stages of construction included the establishment of a pedestrian underpass beneath the last remaining railway line and the creation of a civic plaza and amphitheatre landform. These modest initiatives served not only to provide a physical reconnection between the city and Lake Nipissing, but also to establish a new recreational and cultural destination within the city.

These initial steps towards the implementation of the overall master plan had an immediate transformative effect on the downtown core; Oak Street, which formerly “turned its back” on the water, began to change. Businesses re-oriented themselves to face the park, restaurants, shops and cafes opened along the interface with the park and the downtown began to revitalize from the waterfront inward. A retirement residence was developed along the northern edge of the park and the city embarked on projects aimed at renewing public open space along the shore of Lake Nipissing to further build on the magnetism of the waterfront park.

In relative terms, the investments made to implement the initial phases of the waterfront park master plan were relatively modest – less than $6 million including the clean-up of the site. However, the benefits in terms of that catalysm of economic growth and downtown revitalization have been dramatic. The limited time in which this transformation has occurred is remarkable.

Future phases of the development of the waterfront park are planned to include a children’s’ garden, performance stage, conservatory, water features and heritage carousels, all connected by a miniature railway. The vision for the park has captured the imagination of the community, and the implementation of the initial phases of the project has demonstrated the potential contribution of this revitalization initiative to the future economic development of the City.
Memorandum

To: Commissioners, Associate and Alternate Commissioners, and Observers

From: Tim Eder, Executive Director

Date: September 19, 2014

Re: Workplan update

In May 2012, the Great Lakes Commission Board of Directors approved a 2012-14 workplan for the Commission. A workflow diagram, illustrating the six program areas in the workplan, is shown on the following page.

The workplan is the follow-up document to the Commission’s five-year Strategic Plan. The Strategic Plan addresses how the Commission accomplishes its work through four core programs: Communication and Education, Information Integration and Reporting, Facilitation and Consensus Building, and Policy Coordination and Advocacy. The workplan addresses what projects and activities the Commission pursues, focusing on six broad program areas: 1) Clean Energy and Climate; 2) Water-dependent Economy and Infrastructure; 3) Invasive Species; 4) Water Resources Management; 5) Water Quality and Ecosystem Health; and 6) Habitat and Coastal Management. [Readers will note that the goal statements are intentionally far-reaching and probably beyond the scope of what can be achieved by the Commission’s work alone.]

The program areas identified herein seek to address the needs of Member states/provinces, reflect current regional priorities, and identify emerging issues and ways that the Commission can leverage its core programs to address them. The new workplan should allow for grouping of similar projects, more efficient management of work and staff resources, guidance for program development efforts, and streamlined communication of progress to Commissioners, Observers and partners. The workplan itself will be updated on a biennial basis.

In December 2013, the GLC unveiled an updated www.glc.org website, which mirrors the organizational structure of the workplan. We invite you to visit the new site, which will provide the most current project updates.

On the pages that follow, you’ll find brief updates from the staff on progress in achieving the objectives within each program area.
GLC Workflow Diagram

Core Service Areas (GLC Strategic Plan)
- Communications/Education
- Info Integration/Reporting
- Facilitation/Consensus Building
- Policy Coordination/Advocacy

The Commission's mandated roles and primary services on behalf of member states and the region.

Administration
- Business Planning
- Business Operations
- Program Development

Day-to-day operations in support of the Commission, its projects and its regional services.

Program Areas (Workplan)
- Clean Energy and Climate
  - Climate change and variability
  - Clean energy
- Water-Dependent Economy and Infrastructure
  - Tourism
  - Commercial navigation
  - Recreational boating
  - Water-dependent economic development
- Invasive Species
  - Prevention & control strategies for new and existing pathways/ vectors
- Water Resources Management
  - Support for Great Lakes-St. Lawrence River Basin Sustainable Water Resources Compact (and Agreement)
- Water Quality and Ecosystem Health
  - Water infrastructure
  - Nonpoint source pollution
  - Atmospheric deposition
  - Oil and hazardous material spills
  - Pollution loadings, beach health
- Habitat and Coastal Management
  - Coastal management
  - AOCs, brownfields
  - Habitat and land use

Current focus areas for projects and program development.
Clean Energy and Climate

Goal: Promote a regional energy mix that can be sustained over generations and is compatible with other uses of Great Lakes-St. Lawrence River water resources and promote policies and programs that provide a high level of resiliency to climate change and its impacts.

Objectives and Actions
1) Objective: Continue to serve as secretariat for the Great Lakes Wind Collaborative (GLWC), a multistakeholder forum dedicated to advancing the sustainable development of wind power in the binational Great Lakes region

**ACTION:** There is no funding to continue to support the GLWC. A GLWC Steering Committee call was held in early spring and many members were interested in continuing the GLWC, but none are willing or able to provide the necessary financial support. GLC staff also held a call with National Renewable Energy Laboratory staff to receive a formal debrief and rationale for not selecting the GLWC proposal for an award. The GLWC website and listservs remain operational, but GLC staff no longer actively convenes GLWC committees or undertakes GLWC work. Work on a three-year subcontract for a larger DOE-funded consortium on offshore wind wraps up in September 2014. Also U.S. Fish and Wildlife Service-funded work to survey pelagic bird activity over the Great Lakes continues.

2) Objective: Foster dialogue and generate information on climate change adaptation issues with a focus on how they affect the water and related natural resources of the Great Lakes-St. Lawrence River basin

**ACTION:** The GLC is completing a MI DEQ Coastal Zone Management-funded project to identify and promote best practices for climate adaptation in coastal wetlands. The final online toolkit will showcase policies, practice and case studies of how wetlands management and restoration activities can maximize climate adaptation potential. A no-cost extension was granted through September 2014 to accommodate project personnel changes.

Water Dependent Economy and Infrastructure

Goal: Work with the states and provinces to develop and implement elements of regional strategies for economic growth and development based on the wise use of Great Lakes-St. Lawrence water resources.

Objectives and Actions
1) Objective: Promote “branding” of the Great Lakes St. Lawrence River region as a domestic and international travel and tourism destination.

**ACTION:** The GLC, in consultation with the Michigan Office of the Great Lakes, has hired a contractor to carry out a perceptions research study for two of Michigan’s Great Lakes Areas of Concern (AOC): Muskegon Lake and White Lake. The aim is to assess and characterize the perceptions of the AOCs among consumers, both internal and external, to help leaders in the two AOCs prepare for “life after delisting” and leverage the value of water-related assets that are being revitalized by cleanup efforts under the GLRI. The project is part of the GLC’s support for the Statewide Public Advisory Council (SPAC) for Michigan’s Great Lakes AOC program. Results will be presented at the SPAC’s fall meeting.
The GLC continues to seek opportunities to advance and promote the Great Lakes Circle Tour, created by the GLC and its member states and provinces in the late 1980s as the premier road travel guide for exploring the coastal regions and communities of the Great Lakes. Securing funding to upgrade the Circle Tour’s website on GLIN with new interactive features is a priority. GLC staff participated in the Lake Michigan Trail Conference in Saugatuck, Mich., May 15-16, and have been invited to join the four-state leadership team of the Lake Michigan Trails Network (IL, IN, MI, WI) to explore synergies between the Circle Tour and the growing network of water, cycling and hiking trails around Lake Michigan.

2) **Objective:** Work with other regional institutions and commercial navigation interests (including ports, vessel operators and governmental transportation agencies) to build regional consensus on maintaining and improving the Great Lakes St. Lawrence Seaway system as a safe, fuel-efficient, economically important and environmentally responsible marine transportation system serving the North American mid-continent

**ACTION:** The GLC serves as secretariat to the Great Lakes Dredging Team (GLDT) to work with state and federal agencies and industry partners on maintaining navigation access to Great Lakes ports and harbors while pursuing sustainable and environmentally responsible dredging operations and management of dredged material. The GLDT convened its annual meeting in May 2014 at the Maumee Bay State Park and Conference Center in Oregon, Ohio. GLDT members received updates from the three standing committees (Technical, Outreach and Legislative) and revised their biennial workplans to reflect current GLDT priorities. Immediately preceding the annual meeting, the GLDT hosted a State Summit Meeting on Open Water Placement of Dredged Material. This meeting provided opportunities for the states, ports and federal agencies to discuss important policy, management and policy issues regarding open water placement. Much discussion focused on the role and application of the federal standard, which is an economic feasibility justification that is used to guide U.S. Army Corps of Engineers’ decisionmaking for dredged material management projects. Specifically, the federal standard is used to assure that any dredged material disposal option is the least costly, environmentally acceptable alternative that is consistent with engineering requirements established for the project. Discussion at the summit focused on whether greater flexibility can be established in the application of the federal standard to promote additional opportunities for beneficial use of dredged material. A briefing paper on beneficial use partnerships with DOT agencies was recently completed and an issue brief on open water placement practices and policy is in preparation.

The GLC recently convened a new Ballast Water Task Force to assess current ballast water standards and develop a common platform among Great Lakes states and provinces from which to advance a future ballast water management regime. An initial conference call was held in March. The task force is currently identifying research topics to address through one or more white papers that will support their work. The GLC is coordinating with the Great Ships Initiative, the Great Lakes Ballast Water Collaborative and the Council of Great Lakes Governor’s AIS Task Force in this effort.

3) **Objective:** Assist the states and provinces in growing the Great Lakes recreational boating and fishing industries as important generators of jobs and economic investment

**ACTION:** Efforts to support harbor maintenance programs in the Great Lakes are continuing, with a particular need to support the efforts of those ports currently receiving little or no financial assistance as a result of ongoing federal budget constraints to receive more federal funding for dredging. To support these smaller harbors, the GLC annual legislative agenda has aligned with the Great Lakes Small Harbors Coalition and others to advocate for reform of the Harbor Maintenance Trust Fund (through the Water Resources Reform & Development Act) to achieve a more equitable process for the funding of dredging (for both commercial and recreational harbors) and other navigation infrastructure maintenance needs.
4) **Objective:** Build partnerships among state, provincial federal and local entities from governmental, university, non-governmental and private sectors to build consensus on priority needs for the Great Lakes-St. Lawrence River regional economy

**ACTION:** GLC staff participated in a May 2014 workshop convened by U.S. EPA on the process of moving from remediation to restoration to revitalization (R2R2R) in environmentally degraded coastal communities. The workshop reviewed existing case studies to better understand how communities are benefiting from AOC remediation and restoration efforts, and explored options for promoting the deliberate achievement of revitalization as a result of remediation and restoration activities in the AOCs. Two key issues arose from the workshop: 1) How to integrate ecosystem goods, services and benefits into AOC planning; and 2) how to track and measure revitalization success associated with AOC efforts. The GLC is exploring how it can engage in and support efforts to advance coastal revitalization and leverage the “Blue Economy” in the region. A summer intern has conducted research to inventory existing programs, policies and initiatives related to coastal revitalization to inform future work in this area. Additional insights are expected from several discussion panels to be convened at the GLC’s Annual Meeting in Buffalo.

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**Invasive Species**

**Goal:** Prevent the introduction and spread and, where necessary, promote management and control of invasive species that are or have the potential to negatively impact water resources or the economy of the Great Lakes-St. Lawrence River basin through a focus on canals/waterways, organisms in trade and ballast water as major pathways.

**Objectives and Actions**

1) **Objective:** Prevent the introduction and spread of invasive species from connecting waterways with a focus on the Great Lakes basin and Mississippi River watershed

**ACTION:** The GLC is working in partnership with the Great Lakes and St. Lawrence Cities Initiative (GLSLCI) to investigate solutions to the threat of Asian carp and other invasive species passing through the Chicago Area Waterways System (CAWS), while maintaining current uses of the system. The GLC and GLSLCI are continuing to convene meetings of an advisory committee as the primary regional stakeholder forum seeking solutions to the problem of AIS transfer through the CAWS. The committee’s role is more important than ever given the lack of a recommended alternative in the GLMRIS report and the need for consensus-based guidance on measures to prevent AIS. In March and April, the GLC and GLSLCI undertook a thorough request for proposals process to select a facilitator with mediation skills to help manage a consensus building process with the committee. The GLC and GLSLCI selected a team of two facilitators: Gail Bingham, president emeritus of RESOLVE, a leading consulting firm in the field of collaboration and consensus building in public decisions, and Tim Brown, founder and president of Wabasheco LLC and an experienced facilitator with significant background and experience in the Chicago and northwest Indiana region. In addition to being highly qualified and experienced, the GLC believes this team possesses the necessary understanding and ability to work with the unique challenges of this effort, including the urgency of the issue, the complexity of the problem, and the political sensitivities involved. The GLC secured funding from the GLRI through the Illinois DNR to support the work of the facilitators.

The advisory committee held meetings in March, May, July and September. With the guidance of the new facilitation team, the group is building a stronger working relationship and developing consensus recommendations on short- and long-term recommendations to address AIS movement between the
Mississippi and Great Lakes. Fifteen of the Great Lakes states’ U.S. Senators sent a letter to John Goss, White House Council on Environmental Quality, in July endorsing the work of the advisory committee. The committee submitted a letter to the Great Lakes Congressional Delegation calling on Congress to direct the Army Corps of Engineers to design a new engineered channel to be constructed in the approach to the Brandon Road lock; evaluate, engineer, and design control technologies to deploy in the approach channel and the Brandon Road lock structure; conduct further research to evaluate reconfiguring locks as a means to control aquatic invasive species; and provide funding for those activities. The recommendations of this letter are consistent with the policy resolution adopted by GLC Commissioners in March 2014.

2) **Objective:** Advance federal programs to reduce the risk of releases of potentially invasive species through the trade in live organisms, including plants and animals sold for live bait, aquarium, aquaculture, water garden and horticulture, among other pathways

**ACTION:** Work is underway on a grant from the Great Lakes Restoration Initiative to develop software and tools to track, identify and monitor the sale of invasive species via the internet. The GLC hired the software development firm RightBrain Networks to develop the web-crawling software system. The final system is complete and in the initial stages of operation. Stakeholders are being engaged to develop a plan for outreach to sellers identified through the project. A workshop is being planned for later this year to share preliminary results from the system and gather input from stakeholders on next steps. Additionally, the GLC continues to engage in activities to support legislation or executive action that would strengthen federal programs to prevent the importation of potentially harmful non-native species.

3) **Objective:** Support initiatives to convene states and provinces in collaborative efforts (including Governor Snyder-led initiative) to develop, advance and fund effective and coordinated approaches to invasive species prevention and control

**ACTION:** The GLC continues to support the Great Lakes Panel on Aquatic Nuisance Species (GLP) and its standing committees. The GLP met in April 2014 in South Bend, Ind., at the University of Notre Dame. The meeting featured sessions on next steps for preventing AIS movement through the Chicago waterways, as well as advancements in surveillance methods, early detection and rapid response. The Great Lakes Panel also toured the Notre Dame eDNA laboratory and the Experimental Ecosystem Facility. In addition, the Great Lakes Water Quality Agreement Annex 6 (AIS) Subcommittee held its second in-person meeting in conjunction with the April GLP meeting. GLC staff have been participating as a member of the subcommittee. The GLC convened a new Ballast Water Task Force to assess current ballast water standards and develop a common platform among Great Lakes states and provinces from which to advance a future ballast water management regime. An initial conference call was held in March. The task force is currently identifying research topics to address through one or more white papers that will support their work. In addition, the GLC is tracking activity on U.S. legislation, S. 2094, the Vessel Incidental Discharge Act, that would preempt state authority to regulate ballast water. Members of the task force contributed to the development of a GLC letter that was sent to the Senate Committee on Commerce, Science and Transportation expressing concerns with the legislation. *(Refer to Policy and Advocacy section for more details.)*

4) **Objective:** Support efforts to manage and eradicate priority invasive species established in the Great Lakes, such as non-native phragmites and sea lamprey

**ACTION:** The GLC continues to expand a partnership with the USGS-Great Lakes Science Center to lead communications and research on the invasive plant Phragmites. The Great Lakes Phragmites
Collaborative, established in 2012, engages the resource management community, reduces redundancy, links science and management, facilitates adaptive management, and encourages a systems approach to management and conservation associated with this species. The Collaborative supports an interactive web hub (www.greatlakesphragmites.net), webinar series, social media presence and email list, and is guided by a regional advisory committee. Staff gave presentations at several meetings and professional conferences. The GLC also supports the Collaborative for Microbial Symbiosis and Phragmites Management, established in partnership with the USGS to bring together researchers to explore the potential to use symbiotic relationships both to control invasive Phragmites and encourage native plant establishment. A manuscript describing this effort was submitted to the journal Biological Invasions.

The GLC’s GIS and data management team are collaborating with Great Lakes Fishery Commission staff to develop a web mapping application to dynamically display sea lamprey control barrier locations, and rivers and waterbodies in the Great Lakes states and Ontario. The application will allow managers and planners to view the length of the river courses protected by each barrier, and provide risk scenarios based on the addition or removal of barriers. A prototype of the tool will be available in October 2014.

5) **Objective:** Elevate awareness of AIS issues and solutions among decisionmakers and the public

**ACTION:** GLC staff attended the national Aquatic Nuisance Species Task Force meeting in May 2014 in Arlington, Va., and provided a presentation on GLC efforts to develop solutions to prevent the transfer of Asian carp and AIS between the Great Lakes and Mississippi River watersheds. In addition, staff participated on a steering committee for and attended the Great Lakes Briefs on Invasive Organisms Traded in Commerce (BIOTIC) Symposium in Milwaukee, Wis., on June 3-4, 2014. The symposium helped to identify research gaps to improve management of Organisms in Trade (OIT) and will facilitate the efficient transfer of information between researchers, managers, educators, OIT industries/associations and the public. A new issue of the *ANS Update*, a two page news publication, is being developed to feature an article on the Great Lakes Phragmites Collaborative. The Update features articles on emerging AIS issues in areas of science and policy, and programmatic progress reports on a state, provincial, regional and federal level.

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**Water Resources Management**

**Goal:** Support the development of a water resources management regime that protects the ecological function of the resource while supporting the sustainable use and conservation of the waters of Great Lakes-St. Lawrence River basin in order to protect public and environmental health, assure economic well-being and sustain a high quality of life for the region’s residents

**Objectives and Actions**

1) **Objective:** Compile and disseminate consistent water withdrawal, diversion and consumptive use information to support requirements of the Water Resources Compact and Agreement.

**ACTION:** The GLC continues to provide annual water use reports to the Great Lakes-St. Lawrence River states and provinces in support of the Great Lakes Water Resources Compact and Agreement. The 2012 annual water use report was completed in February 2014 and is posted on the project website: [http://projects.glc.org/waterusedata/](http://projects.glc.org/waterusedata/). The GLC and the Council of Great Lakes Governors convened a water use data workshop for state and provincial data managers in Ann Arbor, Mich., in mid-May. The purpose of the workshop was to help the states and provinces better coordinate and implement a common methodology for regional water use data reporting. A metadata template was discussed and
2) **Objective:** Support the Regional Body and Compact Council to track and share information on regional trends, policies and progress toward implementation of the Agreement and Water Resources Compact

**ACTION:** The GLC partnered with the Council of Great Lakes Governors and the Great Lakes Observing System (GLOS) on a project to integrate foundational data sets to support a cumulative impact assessment through a grant from the NOAA Regional Ocean Partnership. No comprehensive cumulative impact assessment had ever been conducted in the Great Lakes-St. Lawrence River region on the scale required by the Agreement and Compact. The cumulative impact assessment 2006-10 report and online “dashboard” for comparative data analysis are available at http://www.glerl.noaa.gov/data/dashboard/GLSLRCIAD. The dashboard provides interactive access to the most current revisions of the hydrologic and water use data used to assess cumulative impacts of withdrawals, diversions and consumptive uses.

3) **Objective:** Assist in the development of the Water Resources Agreement’s Science Strategy including identifying and implementing activities to advance water conservation and efficiency within the states and provinces

**ACTION:** The GLC continues to support a team led by John Jackson (formerly of Great Lakes United) and other partners on a Great Lakes Protection Fund project to identify and test the environmental and financial rationales for municipalities to pursue water conservation and green infrastructure practices, and evaluate how this information, when combined with effective knowledge transfer techniques, can drive innovation in water management throughout the Great Lakes region. The team is looking at all aspects of water conservation including municipal water supply, stormwater and wastewater management improvements, and other traditional water conservation strategies. The project is piloting these approaches in six communities: the Regional Municipality of Waterloo, Ontario; the City of Waterloo, Ontario; the City of Guelph, Ontario; and the townships of Lyon, Commerce and southwest Oakland in Michigan. The GLC met with a group of advisors on July 22-23, 2014, in Oakland County, Michigan, to discuss lessons learned, and the vision and messages they would like to convey to a broader set of Great Lakes communities regarding this project. This meeting was immediately followed by a “knowledge transfer” workshop for water management professionals in Oakland County. Participants learned about strategies to reduce summer-peak water demand and other water management practices.

GLC staff continues to partner with the Council of Great Lakes Industries (CGLI) on the third phase of a Great Lakes Protection Fund supported project to help industry optimize water use through the development and application of water stewardship tools for Great Lakes basin industries. The objective of CGLI’s water stewardship project is to help guide industry through the assessment and quantitative confirmation of their water use to help establish good water stewardship practices. The GLC also continues to work with the Council of Great Lakes Governors to identify other opportunities to advance the science strategy of the Water Resources Compact and Agreement.

4) **Objective:** Coordinate data and information sharing between the states and provinces to support the understanding of the Great Lakes-St. Lawrence River physical system and enhance implementation of the Agreement and Water Resources Compact
**ACTION:** The GLC meets and communicates with the USGS science centers from Michigan and Ohio on issues related to water resources streamflow modeling and assessment tools to help states and provinces identify impacts associated with water withdrawals and consumptive use and to explore new methods to coordinate data and information sharing. These methods include conducting annual water use workshops and enhancing the regional data reporting process to include the submission of metadata.

### Water Quality and Ecosystem Health

**Goal:** Improve water quality and ecosystem health in the Great Lakes-St. Lawrence River basin through the reduction of pollution loadings into surface and ground waters and the coordination of monitoring, prevention and response strategies

**Objectives and Actions**

1) **Objective:** Support regional efforts to secure investments in water infrastructure to end sewer overflows and safeguard drinking water supplies

**ACTION:** The GLC is seeking collaborators and programmatic support for the Great Lakes Blue Accounting initiative (refer to Objective 5 below for more details), as charged by the Great Lakes governors and premiers. The recent drinking water crisis in Toledo, Ohio (Aug. 2-4, 2014) highlighted the need for a better system of monitoring, which, tied together with information about the quality and status of municipal water infrastructure, could provide greater predictability and vital information to anticipate, prevent and assist with response efforts in such emergencies. The development of an information monitoring, strategy and delivery system that supports achievement of the region’s priority water outcomes is vital and will be initiated through the Blue Accounting program. The priority outcome, in the case of Toledo, is safe and sustainable municipal water services. Even before the Toledo episode, municipal Water Supply had been chosen as a pilot for the Blue Accounting program.

The GLC continues to track progress and convey to Congress the critical need to support level or enhanced funding for the Clean Water and Safe Drinking Water State Revolving Fund (SRF) programs. *(Refer to Policy and Advocacy section for more details.)*

2) **Objective:** Reduce nonpoint source pollution and improve water quality by building partnerships with state, provincial and federal agencies to improve the efficiency of pollution prevention programs, target them to priority watersheds, and expand public awareness efforts

**ACTION:** The GLC administers the Great Lakes Basin Program for Soil Erosion and Sediment Control (GLBP) which is currently supporting 50 active projects for the 2010-2013 program years. The GLBP is funded by the U.S. Dept. of Agriculture Natural Resources Conservation Service through the GLRI. GLBP grants are awarded to local and state entities to install sediment reduction practices in priority watersheds throughout the Great Lakes basin. The 2013 grants (21 grants totaling more than $1.8 million) were initiated in fall 2013. Annual reports were developed for each of the previous program years. Practices range from cover crops to streambank stabilization to applying gypsum to reduce erosion and phosphorus runoff. The agreement with USDA-NRCS for the 2014 GLBP grants program is under development and will be completed in fall 2014.

The GLC continues to provide technical and administrative support to the U.S. Army Corps of Engineers’ Great Lakes Tributary Modeling Program. GLC staff facilitates communication among the
Corps’ Great Lakes districts through participation in bimonthly program teleconferences, as well as the convening of an annual Great Lakes Sedimentation Workshop, which was held June 5-6. These annual meetings provide an opportunity for federal, state, NGO, university and private sector partners to come together to discuss priorities for Great Lakes soil conservation, sedimentation and NPS pollution prevention, control and planning. GLC staff also assisted the Corps’ Buffalo District in the organization and publicizing of training classes for the program’s online modeling tools. The GLC is sponsoring, with the University of Michigan School of Natural Resources and Environment, a master’s student team project to compare the costs, benefits and policy issues related to various approaches to implementing conservation practices. They will be concentrating on the western Lake Erie basin.

3) **Objective:** Develop recommendations and assist state and federal agencies in implementing actions to reduce the frequency and severity of harmful algal blooms in the Great Lakes by reducing the input of phosphorus and other nutrients through improved clean water infrastructure, research, technical assistance, outreach and education

**ACTION:** The GLC, through a partnership agreement with USDA-NRCS in Wisconsin, is into its second year of the Fox P Trade project to develop a phosphorus credit trading program for the lower Fox River watershed in Wisconsin. Water quality trading provides a cost-effective means for permit-holders to achieve compliance and holds potential to help address high nutrient levels and algal blooms. Stakeholder engagement continues through monthly management team calls, periodic meetings and webinars. Subcontracts have been issued to conduct a feasibility assessment, secure dedicated Wisconsin DNR personnel on the project, and to develop a “credit calculator.” Recent activity is focused on conducting “hypothetical trades” among actual parties in the watershed, using real data. The GLC is actively working to overcome technical hurdles related to applying multiple policy documents and models. Core team members (GLC, WI DNR and NRCS staff) have met twice with U.S. EPA representatives to ensure project work comports with Clean Water Act requirements so that trades can be used for compliance. The project is scheduled to be completed in the third quarter of 2015.

The Lower Fox Demonstration Watershed project began in December 2013 and is in the beginning implementation phase. This $1 million, five-year agreement between the GLC and USDA-NRCS was signed in October 2013. An in-person project management team meeting was held May 7, 2014, in Appleton, Wis., to provide updates and visit the four selected sites. The conservation plans for each site are being developed by NRCS. A contract between the GLC and Brown County for the local liaison position was developed and signed.

4) **Objective:** Advance state, provincial and federal efforts to reduce Great Lakes impairments from atmospheric contaminants by supporting necessary research and information collection to drive risk assessment, priority setting and pollution reduction actions

**ACTION:** The GLC completed a multiyear, collaborative project funded by the U.S. EPA via a 2011 GLRI grant. The project objectives were to: a) estimate a regional Polybrominated diphenyl ethers (PBDE) inventory for the Great Lakes basin; b) propose metrics to quantify the magnitude of reductions; and c) recommend a formal approach to finding alternatives to PBDEs. Final products from this effort included three summary papers on these topics, which are available on the project website (http://glc.org/projects/water-quality/pbde). The GLC also partnered on a 2012 GLRI grant to organize workshops for industry representatives (i.e., furniture and textile manufacturers and retailers) on the concerns associated with the use of flame retardants and to encourage development of partnerships that could result in expanding the market share of product lines that can be produced without these additives. With the conclusion of these two projects, the GLC’s direct involvement in work relating to the reduction of Great Lakes loadings from atmospheric contaminants has now ended.
5) **Objective:** Enhance coordination, communication and data management among the many agencies and organizations that conduct or benefit from coastal and nearshore monitoring efforts in the basin

**ACTION:** In 2013, the Great Lakes governors and premiers called for a comprehensive approach to monitoring Great Lakes water resources. In response, a GLC-led, binational workgroup was convened with broad expertise from the government, industry, academic and NGO sectors. The workgroup met twice in person for two-day sessions in February-March. Building on their collective wisdom, the GLC proposed adoption of a Great Lakes Blue Accounting process to the governors at their April 2014 summit in Chicago. The Blue Accounting program will enable the Great Lakes community to create a consensus-based set of desired goals for Great Lakes water resources management; identify a logical set of strategic actions and process metrics for evaluating the effectiveness of the actions; determine how much and what types of data and information are necessary to support the selected process metrics; and optimize investments in regional information infrastructure. The full report, *Great Lakes Blue Accounting: Empowering Decisions to Realize Regional Water Values*, is accessible at [glc.org/docs/2014-blue-accounting-recommendations-glc](http://glc.org/docs/2014-blue-accounting-recommendations-glc). The GLC will be supplementing its existing staff with a new senior-level position (Director of Information Strategy/Chief Technology Officer) and approaching other prospective donors and investors, in both the public and private sectors, to support this project. In July, the GLC hosted a Great Lakes Information Harmonization Workshop, which convened representatives of the region’s key Great Lakes data and information management programs and portals to envision and design a collaborative and efficient structure for regional data and information management.

A final assessment report on the 2013 Lake Michigan Nearshore Monitoring Inventory was completed in spring 2014 by the GLC-staffed Lake Michigan Monitoring Coordination Council’s (LMMCC) Nearshore Monitoring (NEMO) workgroup. Following up two workshops and a webinar in 2013, the group held a webinar in late March 2014 titled *LMMCC-NEMO Spring 2014 Webinar: Back to the Future*, which featured plans for the CSMI 2015 intensive year monitoring for Lake Michigan (including states’ roles), updates on the GLWQA Annexes 2 & 4, a USGS update/results for GLRI tributary work, and the need and process to update the Lake Michigan Nearshore Monitoring Inventory of 2013. This new/updated inventory will occur in fall 2014. A conference call of a “Framework Group” for the LMMCC will occur in late August to begin to set the stage for forthcoming work under the new interagency agreement with USGS.

The GLC continues to support the data management efforts of the Great Lakes Observing System, including development of an enhanced GLOS Data Portal (see [glos.us/data-access/data-portal](http://glos.us/data-access/data-portal)).

The GLC administers the Michigan Clean Water Corps program (MiCorps), which funds two volunteer water quality monitoring programs, the collection and dissemination of volunteer monitoring data using standardized methodologies, small-scale stream cleanup events, and educational initiatives related to water quality in Michigan. In 2014, the GLC awarded seven volunteer stream monitoring grants totaling nearly $50,000; supported volunteer water quality sampling at 219 inland lakes under the Cooperative Lakes Monitoring Program; and awarded 16 small grants totaling nearly $33,000 to local units of government for river and stream cleanup events. On Oct. 27-28, staff will convene the 10th annual MiCorps conference at the R.A. MacMullan Conference Center on Higgins Lake, featuring presentations on monitoring and citizen science initiatives as a way to maintain the health of Michigan’s freshwater systems, as well as volunteer training from regional experts.

The GLC provides secretariat and web hosting services for the Great Lakes Beach Association. GLC staff are currently coordinating, in collaboration with Environment Canada and U.S. EPA, the 14th Annual Great Lakes Beach Association Conference, which will be held Nov. 12-14 in Toronto. Professional papers will be presented in sessions focused on beach monitoring, sources of contamination, management of beaches, physical and hydrological beach processes, communicating health and safety risks to the public, and more. The event will also feature a poster session, vendor displays and hands-on training workshops for beach managers.
6) **Objective:** Help coordinate spill prevention/response programs and build partnerships between state, provincial and federal agencies to improve planning, make response efforts more efficient, and expand public awareness of the risks associated with oil and hazardous material spills

**ACTION:** Maintenance of statewide Inland Sensitivity Atlases (ISAs) for use by spill responders remains a priority. Processing of data updates for the latest version of the Ohio ISA began in early 2013; map production was delayed by the release of new data on sensitive species for the region. Those data have been processed and mapping will resume in August. A completed update is now expected by May 2015. GLC staff continue to assist with design and content development for the federal Region 5 Regional Response Team website; updates to the federal Region 5 Regional Contingency Plan; updates to the Northern Michigan Subarea Spill Contingency Plan, in conjunction with U.S. EPA, U.S. Coast Guard, and local, county and tribal agencies; and continued development of a pilot tool under the Environmental Information Exchange Network to produce an updateable inventory of emergency response resources.

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7) **Objective:** Review the status of state emergency preparedness response programs and regulations and the adequacy of federal programs through a reestablished Emergency Preparedness Task Force

**ACTION:** Staff have put significant effort into a report for the states and provinces detailing issues related to crude oil transportation in the Great Lakes region. An extensive literature review was carried out and issue briefs drafted that discuss crude oil characteristics, modes of transportation, economic considerations, potential risks and impacts of crude oil transportation, and associated policies, programs and regulations. A working draft of the full report and a request for input from interested parties will be distributed at the GLC Annual Meeting in Buffalo.

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8) **Objective:** Enhance protection of public health by improving the expediency and reach of communication mechanisms for broadcasting water quality advisories and beach health information

**ACTION:** The GLC’s myBeachCast mobile app will add an iOS (iPhone) version in the year ahead, as well as additional information about hazards and dangerous currents to increase the safety of beachgoers. Originally released in 2012 for Android mobile devices, myBeachCast ([http://beachcast.glinc.net](http://beachcast.glinc.net)) provides real-time information on beach water quality advisories, weather and water conditions for more than 1,900 Great Lakes and inland beaches. Funding for the app enhancements comes through a recently awarded grant from the National Oceanic and Atmospheric Administration (NOAA) Coastal Storms Program. GLC staff participated in a May 29 news conference, hosted by the Great Lakes Surf Rescue Project at the Shedd Aquarium in Chicago, where families and friends of Great Lakes drowning victims from northern Michigan, Ohio and the Chicago area shared their stories. GLC Commissioners Marc Miller, Todd Main and Carmen Lonstein participated in the event.

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9) **Objective:** Support regional efforts to plan for and invest in green infrastructure to better manage stormwater and to improve the quality of urban water resources

**ACTION:** The GLC has joined a team led by John Jackson (formerly of Great Lakes United) and other partners on a Great Lakes Protection Fund project to identify and test the environmental and financial rationales for municipalities to pursue water conservation and green infrastructure practices, and evaluate how this information can drive innovation in water management throughout the Great Lakes region. *(See the Water Resources Management section, objective 3, for additional details.)*
Habitat and Coastal Management

Goal: Contribute to the preservation of diverse habitats and natural communities that sustain populations of desirable species; the restoration of degraded areas, such as the Areas of Concern; and the conservation of coastal resources to support sustainable activities that depend on access to the waters of the Great Lakes

Objectives and Actions
1) **Objective:** Support the work of federal, state and local agencies and advisory groups to develop and implement restoration projects with a focus on Areas of Concern and place-based restoration that can achieve multiple ecosystem objectives (e.g., climate change, habitat restoration, sustainable water resource management, invasive species prevention and control)

**ACTION:** The GLC continues to provide staff support to the Statewide Public Advisory Council (SPAC) for Michigan’s Areas of Concern (AOC) Program. Recent actions include the SPAC’s summer meeting, held July 16 in Ishpeming, Mich., in the Deer Lake AOC; administering grants to local Public Advisory Councils to support restoration work; and assisting with the 2014 annual conference for the U.S. AOC program, held March 18-19 in Chicago. Several of Michigan’s AOCs are being “delisted” this year (with more to be delisted in coming years) and the SPAC is advising on that process and helping local AOC advisory councils prepare for “life after delisting.” Among other activities, the GLC is overseeing a perceptions research project for two AOCs (see the Water Dependent Economy and Infrastructure section for more details on this project). The GLC received a grant to lead a new NOAA GLRI-funded, three-year regional partnership to support habitat restoration in priority AOCs in the region. Year one funding was allocated for restoration at the St. Marys River AOC in Michigan and year two funding will support restoration at the Buffalo River AOC in New York. We anticipate that additional funds will be provided this year to expand work at Buffalo River and fund restoration at Muskegon Lake AOC in Michigan. The GLC is working with local agencies and associated states to implement these projects over the next several years. Staff are also leading projects to address climate change in coastal wetlands and improve communication, management and research of invasive Phragmites. (See sections above for details.)

2) **Objective:** Advance federal programs that support our habitat and coastal management goal

**ACTION:** The GLC works closely with the states and federal agencies to establish regional positions and priorities related to habitat and coastal management policies, and legislative initiatives. The GLC supported strong conservation provisions in the reauthorization of the Farm Bill, primarily the Regional Conservation Partnership Program, which is now being implemented and includes funding for conservation projects addressing priorities in the newly designated Great Lakes Critical Conservation Area. With support from the USACE, the GLC has developed the Great Lakes Restoration Database, http://habitat.glc.org/, to showcase projects implemented under Focus Area Four of the Great Lakes Restoration Initiative (GLRI). This searchable database was developed to increase awareness and improve communication on the accomplishments of the GLRI. GLC also sits on the steering committee of the Upper Midwest and Great Lakes Landscape Conservation Cooperative.

3) **Objective:** Ensure that the science needs of state natural resource managers are addressed by federal research laboratories and that environmental managers have access to the latest scientific information

**ACTION:** Staff is completing a pilot project with Michigan DEQ, Wisconsin DNR and Wayne State University to test sharing of ecosystem monitoring data using infrastructure and data handling practices developed by the Environmental Information Exchange Network. Tools developed for the project will
facilitate submission and retrieval of ecosystem-related data developed outside of state or federal monitoring and regulatory programs. The project is in its last phase, finalizing the processes used to handle variations in database structure so that data can be submitted by partner organizations. Data sets from Wisconsin DNR and Wayne State University are being used to test an Exchange Network server hosted by GLC.

The GLC partners with federal agencies to facilitate communication and coordination between states and federal research laboratories. In 2011, the GLC established a Memorandum of Understanding with the U.S. Geological Survey (USGS) to facilitate collaboration with its Great Lakes Science Center in Ann Arbor. In the first half of 2014 GLC hosted Dr. Paul Seelbach while USGS-GLSC hosted Victoria Pebbles under an Interagency Personnel Agreement. A 2014 annual workplan under the MOU has been developed that includes continued work on past partnerships with the Great Lakes Phragmites Collaborative and the Coastal Science Strategy. The agreement covers seven joint initiatives between the GLC and GLSC:

1. Phragmites Initiative
2. Great Lakes Coastal Science Strategy
3. Urban Coast Revitalization
4. Beach and Coastal Health
5. Nutrients and Harmful Algal Blooms
6. Coastal Infrastructure and Nearshore Habitats
7. Lake Michigan Monitoring Coordination Council and its Nearshore (NEMO) Workgroup

The first two are explicitly funded; others are not.

4) **Objective**: Respond to needs and interests of the states and provinces related to coastal management issues

**ACTION**: With funding from the USFWS Great Lakes Fish and Wildlife Restoration Act, the GLC is in its second year of surveying and mapping avian resources in the nearshore and open waters of lakes Erie, Huron, Michigan and Ontario. The GLC is working with the USFWS, USGS, Michigan DNR, MSU, Biodiversity Research Institute, the Michigan Natural Features Inventory and the Western Lake Michigan Bird and Bat Observatory to collect bird data that will support decisions regarding offshore siting of wind turbines or other potential open lake uses or conservation efforts. The summary document of the Great Lakes Pelagic Bird Stakeholder Engagement Workshop was published this summer on the Great Lakes Wind Collaborative Events webpage at [http://glc.org/projects/energy/wind/glwcevents/](http://glc.org/projects/energy/wind/glwcevents/). It includes six recommendations on developing an avian research agenda for offshore wind energy development in the Great Lakes. Associated with the workshop is a companion document developed by the Biodiversity Research Institute that proposes a four-step approach in reducing the adverse effects of offshore wind development on waterbirds in the Great Lakes ([http://glc.org/files/Great-Lakes-waterbird-vulnerability-to-offshore-wind-FINAL.pdf](http://glc.org/files/Great-Lakes-waterbird-vulnerability-to-offshore-wind-FINAL.pdf)).

The GLC is also completing a MI DEQ CZM-funded project to identify and promote best practices for climate adaptation in coastal wetlands. *(See more detail under “Climate and Energy” update.)*
**Policy Coordination and Advocacy**

The centerpieces of the GLC’s policy coordination and advocacy program are its annual legislative priorities statement and Great Lakes Day in Washington. The 2014 statement, *Advancing Economic Strength and Environmental Integrity for the Great Lakes and St. Lawrence River Region*, was released on March 6 – Great Lakes Day 2014 – and guides the GLC’s advocacy activities in 2014. Top priorities for 2014:

- Sustaining progress under the Great Lakes Restoration Initiative
- Taking action to protect the Great Lakes and St. Lawrence River against Asian carp and other invasive species
- Passing comprehensive legislation to strengthen and accelerate Great Lakes conservation efforts
- Helping communities upgrade aging water infrastructure
- Supporting Farm Bill programs that prevent polluted runoff and protect water quality
- Maintaining and improving infrastructure for the Great Lakes navigation system

Below is a brief summary of actions taken on these federal priorities since the Semiannual Meeting, as well as reports on other policy and advocacy issues affecting the Great Lakes that have come up since that time.

**Status of Appropriations for Major Great Lakes Programs**

The following table summarizes appropriations (in millions of dollars) for selected Great Lakes programs for Fiscal Year 2014; the President’s budget request for FY 2015; and any action taken to date in Congress on FY 2015 appropriations bills affecting these programs. *(Note that this table is current as of August 18. Congressional action since then will be available at the time of the Annual Meeting.)*

<table>
<thead>
<tr>
<th>Program</th>
<th>FY 2014</th>
<th>FY 2015 Budget Request</th>
<th>Congressional Actions</th>
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</thead>
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<tr>
<td>Great Lakes Environmental Research Laboratory</td>
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<td>$9.6</td>
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<tr>
<td>Dispersal Barrier and Interbasin Study</td>
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<td>Harbor Maintenance Trust Fund</td>
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<tr>
<td>BEACH Grants</td>
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<td>$9.5 million (Senate proposed)</td>
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<td>Section 106 Water Pollution Control</td>
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<td>$230 (Senate proposed)</td>
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**Sustain Progress Under the Great Lakes Restoration Initiative (GLRI)**

Congressional support for the GLRI continues to be strong. Congress provided $300 million for the GLRI in FY 2014 (an increase from the FY 2013 sequester level and equal to the President’s budget request) and both the House and Senate Appropriations Committees’ FY 2015 appropriations bills for U.S. EPA provide $300
$14 million for the GLRI, a $25 million increase from the president’s budget request. The GLC continues to devote substantial efforts to urging Congress to fully fund the GLRI. This includes factsheets showing GLRI projects funded in each state and showcasing economic benefits from the Great Lakes, and outreach to the states and local stakeholders urging them to convey support for the GLRI to their congressional representatives. In a tremendous display of support from the Great Lakes congressional delegation, a bipartisan group of 11 senators and 46 representatives sent letters in March to the Senate and House appropriations committees urging level funding of $300 million for the GLRI in FY 2015. As noted above, both committees have agreed to this funding level in their proposed appropriations bills for U.S. EPA.

In May the federal Great Lakes Interagency Task Force released a draft Great Lakes Restoration Initiative Action Plan II for public input. The new Action Plan will guide the GLRI from FY 2015-2019. Generally, it addresses the same five focus areas as the previous Action Plan: cleaning up AOCs; preventing and controlling invasive species; reducing nutrient runoff; restoring habitat to protect native species; and promoting integrated solutions to cross-cutting issues. It incorporates a science-based adaptive management framework to prioritize ecosystem problems and select and assess the effectiveness of GLRI projects; and measures of progress to track all actions implemented under GLRI.

Establish Strong Protections Against Aquatic Invasive Species (AIS)

The GLC continues to work with Congress and regional stakeholders to advance measures to prevent the movement of Asian carp and other invasive species through the Chicago Area Waterway System (CAWS) and other pathways. With release of the Great Lakes and Mississippi River Interbasin Study (GLMRIS) in January, there is significant interest in Congress and among regional stakeholders to take action, particularly on short-term actions to reduce the risk of Asian carp movement while a long-term solution is developed. Commission staff have communicated with congressional leaders on funding and legislative priorities in this area, consistent with the resolution adopted at the Commission’s 2014 Semiannual Meeting. In addition to funding for near-term control measures, the Corps has been clear that it needs direction from Congress to proceed with continued work on GLMRIS.

The Commission is now focused primarily on its work with the CAWS Advisory Committee, discussed above in detail in the Invasive Species workplan update. A key recent accomplishment of the Advisory Committee is a letter (attached) calling on Congress to direct the Army Corps of Engineers to lead work on short-term solutions (see discussion in the Invasive Species section).

In a significant demonstration of support for the work of the CAWS Advisory Committee, 15 members of the Senate Great Lakes Delegation in late July wrote to John Goss, Asian Carp coordinator with the White House Council on Environmental Quality, recognizing the work of the committee.

Pass Comprehensive Legislation to Enhance and Accelerate Great Lakes Conservation Efforts

The GLC has endorsed the Great Lakes Ecological and Economic Protection Act (GLEEPA), introduced in the House (HR 2773) and Senate (S. 1232) in 2013, which would authorize the GLRI at $475 million annually; reauthorize EPA’s Great Lakes National Program Office (GLNPO) at $25 million annually; reauthorize the Great Lakes Legacy Act at $150 million (Senate bill) or $100 million (House bill) annually; establish a Great Lakes Advisory Board; authorize a Federal Interagency Task Force; and call for implementation of the Great Lakes Water Quality Agreement. In July the Senate Environment and Public Works Subcommittee on Water and Wildlife held a hearing on GLEEPA and several other bills. The GLC collaborated with a number of other regional organizations on a joint letter to committee and subcommittee leaders (copied to the Senate Great Lakes delegation) endorsing the bill and also sent its own letter. Speaking at the hearing, U.S. EPA’s principle deputy assistant administrator for water noted that protecting and restoring the Great Lakes is “a national and even international imperative.”
Address the Crisis Facing Commercial Navigation and Recreational Harbors in the Great Lakes

After several years of negotiations, Congress passed the Water Resources Reform and Development Act (WRRDA) in May and the bill was signed into law by the president. The GLC has communicated actively in support of provisions that would increase funding for dredging and navigation infrastructure in the Great Lakes, including reform of the Harbor Maintenance Trust Fund (HMTF); funding authorization for operating and maintaining the Great Lakes Navigation System; and direction to the Army Corps of Engineers to manage and allocate funding for the Great Lakes Navigation System (GLNS) as a single, comprehensive system. These priorities have also been endorsed by the Great Lakes governors. The following are highlights of the new WRRDA law:

- **HMTF reform:** Congress is required to steadily increase appropriations from the HMTF, reaching 100 percent of annual revenues by 2025, with a FY 2015 target of $1.165 billion. The spending targets do not apply for any fiscal year in which total Corps non-harbor maintenance spending is less than the previous fiscal year.
- **Great Lakes-specific funding:** The law sets aside 10 percent of funding above the FY 2012 level ($874 million) for Great Lakes ports.
- **Recreational harbors:** Additional funding is required for emerging harbors (<1 million tons; 10 percent above FY 2012 levels) and underserved harbors (5 percent above FY 2012 levels). Additionally, the Corps must consider more than tonnage in budgeting for harbor maintenance.
- **Authorization of the Great Lakes Navigation System:** The Great Lakes is authorized as a single navigation system for purposes of funding.
- **Asian carp and invasive species:** USFWS is authorized to coordinate Asian carp efforts in the Upper Mississippi and Ohio rivers and the Upper St. Anthony’s Lock and Dam is authorized for closure. The Corps is authorized to undertake emergency and interim measures to prevent invasive species from entering the Great Lakes. The Administration is required to review existing authorities to respond to invasive species and make recommendations to Congress for improving federal and state laws, and the GAO is to study the impacts of aquatic invasive species.


In June the GLC wrote to the Senate Appropriations Committee and Subcommittee on Energy and Water Development urging funding for the Great Lakes, including the president’s request for operations and maintenance; appropriations from the HMTF; and the 10 percent set aside for the GLNS.

While questions remain about how the Corps will implement the new WRRDA bill and how congressional appropriators will allocate funding pursuant to the bill’s guidelines, overall it will benefit the Great Lakes region. The GLNS authorization will enable congressional appropriators to allocate funding above the Administration’s request for Great Lakes ports and harbors, which are also eligible for funding set aside for specific categories of harbors. Continued advocacy for Great Lakes funding will be needed, but the new law is an important step in the right direction to address pressing needs facing the Great Lakes navigation system.

**Provide Funding to Upgrade Aging Water Infrastructure**

As noted in the table above, the House and Senate have proposed different FY 2015 funding levels for the Clean Water and Drinking Water State Revolving Fund (SRF) programs, with the Senate committee bill proposing level funding and the House committee proposing a lower funding level, consistent with the President’s budget request. The GLC will continue to track progress in finalizing FY 2015 appropriations and, where appropriate, will convey support for level funding for these two important programs.
Reauthorize the Farm Bill to Advance Soil Conservation and Water Quality Protections in the Great Lakes Region

In February Congress passed and the President signed a new Farm Bill with a new Regional Conservation Partnership Program (RCPP) that will take the place of the current Great Lakes Basin Program for Soil Erosion and Sediment Control and increase funding for priority conservation areas. However, the bill’s report language directs NRCS to continue using the Basin Program to help implement the GLRI while it is in effect and while new Farm Bill conservation programs are developed. The RCPP is intended to provide a single approach to support locally led conservation projects; it uses a competitive approach that encourages producers and partner organizations to work collaboratively to develop joint conservation strategies. Assistance will be provided through existing programs, such as EQIP, CSP, ACEP, HFRP, and the Watershed and Flood Prevention program.

The Great Lakes have been designated a Critical Conservation Area (CCA) under the RCPP with a goal to manage nutrients and sediment to reduce algal blooms and provide habitat for fish and wildlife. In May NRCS released an RFP for nearly $400 million under the RCPP for FY 2014 and 2015, with $138 million for the eight designated CCAs. The GLC has been invited to submit a full proposal in conjunction with partners in the Greater Milwaukee River area to address non-point sources of pollution in that watershed. Full proposals are due in early October and funding decisions will be announced Oct. 17.

There are questions regarding how the RCPP will function and how the Great Lakes CCA can best target priority watersheds and generate outcomes for water quality and habitat. The GLC may benefit from a provision that allows NRCS to establish alternative funding arrangements with a “multistate water resource agency” for efforts in the CCAs. The RCPP will be a major source of funding for conservation efforts and it should effectively target areas where soil erosion and nutrient runoff impact water quality, such as HABs.

Other Policy and Advocacy Issues

Ballast Water

In July the GLC wrote to the Senate Commerce Committee expressing concern about provisions in the Vessel Incidental Discharge Act of 2014 (S. 2094) that would preempt state authority to address vessel discharges, including ballast water, within state waters. The provisions would override provisions in the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 and exempt ballast water and other discharges incidental to the normal operation of vessels from requirements under the federal Clean Water Act. By solely instituting the Coast Guard’s ballast water permit program, the bill would rescind the requirement for ballast water exchange and salt water flushing, which are considered highly effective best management practices.

Deep Geologic Repository for Low and Intermediate-Level Nuclear Waste Proposed by Ontario Power Generation

Ontario Power Generation (OPG) has proposed a deep geologic repository (DGR) for low- and intermediate-level nuclear waste to be sited at its Bruce nuclear site in Kincardine, Ontario, near the shore of Lake Huron. Because of its proximity to Lake Huron (< 1 mile) and the perceived risk of nuclear contamination of the Great Lakes, a number of stakeholders oppose the facility, including the Great Lakes and St. Lawrence Cities Initiative, Alliance for the Great Lakes, environmental groups such as the National Wildlife Federation and Sierra Club, and many municipalities along the lakes. In May the Michigan State Senate adopted resolutions calling on the GLC to study and take a formal position on the proposed DGR. GLC staff and Board have developed a process for responding to the Michigan Senate resolution that will involve reviewing OPG’s compliance with legal and procedural requirements for siting the DGR and associated documentation; consulting with representatives in Michigan and Ontario; reporting findings to the Board; and preparing a resolution conveying the GLC’s formal position to the Michigan Senate.
Dear Members of the Great Lakes Congressional Delegation:

This letter is written on behalf of the Advisory Committee for the Chicago Area Waterway System (CAWS). The committee includes representatives from 32 public and private stakeholders that benefit from and have responsibilities related to the CAWS, as well as regional stakeholder groups representing commercial, recreational, and environmental interests. We ask for your support to 1) direct the Army Corps of Engineers to take action on the requests below, and 2) to fund those actions. Further, we request that the studies outlined below result in decision-making documents that provide an actionable path forward for short-term measures that will reduce the risk of aquatic invasive species including Asian carp (AIS) reaching the Great Lakes from the Mississippi River system.

As a follow up to the Great Lakes and Mississippi River Interbasin Study (GLMRIS), the Advisory Committee is committed to finding a two-way, long-term solution that prevents the inter-basin transfer of AIS while also maintaining or enhancing transportation, maritime commerce, water quality, recreation, and flood protection in the region. The Advisory Committee is working to develop consensus recommendations on a long-term solution by December 2015. The Committee also supports the ongoing work of the Asian Carp Regional Coordinating Committee (ACRCC). The investments we are proposing below will develop and demonstrate control technologies for near-term actions to reduce the risk of transfer of AIS into the Great Lakes.

The Advisory Committee believes that the Brandon Road lock and dam is an important site for a demonstration of additional one-way measures to reduce the risk of upstream movement of AIS into both the CAWS and the Des Plaines River, while maintaining efficient navigation.\(^1\) Control measures at Brandon Road can provide a degree of risk reduction now, and may be consistent with the ultimate long-term solution. This site can also serve as a valuable national proving ground to demonstrate technologies that can be used in other areas – such as the Ohio and Upper Mississippi rivers – to prevent the expansion of AIS. To be effective, an engineered channel at Brandon Road will be required and a full set of control technologies to be deployed there will need to be evaluated.

In addition to the consideration of short-term measures at Brandon Road, the Advisory Committee requests that additional studies be initiated now to evaluate the potential for new lock configurations and gate systems that are identified in the GLMRIS report. While any new lock configuration would be considered as part of a long-term solution, more work is required to fully understand this possibility.

The Advisory Committee asks that Congress support and fund the following:

1. **Design of a new engineered channel to be constructed in the approach to the Brandon Road lock.** The existing approach channels to the Brandon Road lock may lend themselves to construction of a new engineered channel. Such a channel would enable deployment of control technologies with greater effectiveness due to the narrower and more concentrated area on which they would be implemented.

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\(^1\) Efficient navigation means that the flow of traffic will not be significantly hindered during construction or after completion of construction by the new structures or technologies.
2. **Evaluation, engineering, and design of control technologies to deploy in the approach channel and the Brandon Road lock structure.** Several “add-on” control technologies are being evaluated as part of the Asian Carp Control Strategy Framework. These technologies could be used in the approach channel to deter AIS from entering the lock along with other control technologies in the existing lock to prevent AIS moving further upstream towards Lake Michigan. The Army Corps of Engineers, in collaboration with other federal and state agencies, should complete the evaluation, engineering, and design of appropriate control technologies that could be deployed at the Brandon Road lock and approach channel. Any technologies that are tested and/or employed at Brandon Road must take into account the important ecological value of the location, as the Brandon Road lock tail waters are critical habitat for this segment of the Des Plaines River.

3. **Research to further evaluate reconfiguring locks as a means to control aquatic invasive species.** The GLMRIS report proposed a new lock configuration and gate system that would allow boat traffic to pass between water bodies and that would exchange water in a way to prevent the passage of aquatic organisms. If such a concept is proven to be feasible, it could be deployed in the CAWS as part of a long-term solution. It could also be used in other river systems to prevent the movement of AIS. However, significant questions remain regarding its potential effectiveness. One concern is whether such locks could adequately flush out species or whether additional treatment technologies will be required. Further, the overall cost and time frame for deployment and impacts on the water system as a whole and commercial navigation need to be identified before proceeding to full engineering and design. The Advisory Committee supports initial research and design necessary to further evaluate the concept’s effectiveness in preventing AIS transfer.

**Request:** The Advisory Committee requests that Congress provide $8 million, and additional funding levels as appropriate, to the Army Corps of Engineers in FY 2015 to conduct the above studies. Upon approval of funding, the Army Corps of Engineers should be directed to provide to Congress, within six months, a detailed schedule and cost estimate for completing the necessary studies for the above projects. The studies will result in design and engineering analysis as well as projected design and construction costs, timelines, and any new legislative authority required to implement the projects.

The Army Corps of Engineers should be instructed to complete these investigations within two years and to coordinate with other federal and state agencies and non-federal partners via the Asian Carp Regional Coordinating Committee and to report to the Advisory Committee. In addition to these specific investigations and reports, the Advisory Committee asks that the Army Corps of Engineers provide Congress with a decision-making document that incorporates the Corps’ traditional principles, guidelines and policies, including the evaluation of alternatives, selection of a recommended plan, and compliance with applicable environmental statutes. This should be sufficient to enable Congress to authorize and fund, and the Army Corps of Engineers to proceed to implementation of, a recommended plan for near-term measures.

These requests reflect the consensus of the Advisory Committee. We appreciate your support for these urgent and immediate actions to strengthen protections against the movement of AIS into the Great Lakes.

Sincerely,
<table>
<thead>
<tr>
<th>Alliance for the Great Lakes</th>
<th>Great Lakes Sport Fishing Council</th>
<th>Mississippi Interstate Cooperative Resource Association (MICRA)</th>
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<tbody>
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GREAT LAKES BASIN COMPACT

(With State & Federal Legislative History)

Reprinted by

Great Lakes Commission
Eisenhower Corporate Park
2805 S. Industrial Hwy., Suite #100
Ann Arbor, Michigan 48104-6791
GREAT LAKES BASIN COMPACT

The party states solemnly agree:

ARTICLE I

The purposes of this compact are, through means of joint or cooperative action:

1. To promote the orderly, integrated, and comprehensive development, use, and conservation of the water resources of the Great Lakes Basin (hereinafter called the Basin).

2. To plan for the welfare and development of the water resources of the Basin as a whole as well as for those portions of the Basin which may have problems of special concern.

3. To make it possible for the states of the Basin and their people to derive the maximum benefit from utilization of public works, in the form of navigational aids or otherwise, which may exist or which may be constructed from time to time.

4. To advise in securing and maintaining a proper balance among industrial, commercial, agricultural, water supply, residential, recreational, and other legitimate uses of the water resources of the Basin.

5. To establish and maintain an intergovernmental agency the end that the purposes of this compact may be accomplished more effectively.

ARTICLE II

A. This compact shall enter into force and become effective and binding when it has been enacted by the legislature of any four of the States of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin and thereafter shall enter into force and become effective and binding as to any other of said states when enacted by the legislature thereof.

B. The Province of Ontario and the Province of Quebec, or either of them, may become states party to this compact by taking such action as their laws and the laws of the Government of Canada may prescribe for adherence thereto. For the purposes of this compact the word 'state' shall be construed to include a Province of Canada.

ARTICLE III

The Great Lakes Commission created by Article IV of this compact shall exercise its powers and perform its functions in respect to the Basin which, for the purposes of this compact shall consist of so much of the following as may be within the party states:

1. Lakes Erie, Huron, Michigan, Ontario, St. Clair, Superior, and the St. Lawrence River, together with any and all natural or manmade water interconnections between or among them.

2. All rivers, ponds, lakes, streams, and other watercourses which, in their natural state or in their prevailing conditions, are tributary to Lakes Erie, Huron, Michigan, Ontario, St. Clair, and Superior or any of them or which comprise part of any watershed draining into any of said lakes.
ARTICLE IV

A. There is hereby created an agency of the party states to be known as The Great Lakes Commission (hereinafter called the Commission). In that name the Commission may sue and be sued, acquire, hold and convey real and personal property and any interest therein. The Commission shall have a seal with the words, 'The Great Lakes Commission' and such other design as it may prescribe engraved thereon by which it shall authenticate its proceedings. Transactions involving real or personal property shall conform to the laws of the state in which the property is located, and the Commission may by by-laws provide for the execution and acknowledgment of all instruments in its behalf.

B. The Commission shall be composed of not less than three commissioners nor more than five commissioners from each party state designated or appointed accordance with the law of the state which they represent and serving and subject to removal in accordance with such law.

C. Each state delegation shall be entitled to three votes in the Commission. The presence of commissioners from a majority of the party states shall constitute a quorum for the transaction of business at any meeting of the Commission. Actions of the Commission shall be by a majority of the votes cast except that any recommendations made pursuant to Article VI of this compact shall require an affirmative vote of not less than a majority of the votes cast from each of a majority of the states present and voting.

D. The commissioners of any two or more party states may meet separately to consider problems of particular interest to their states but no action taken at any such meeting shall be deemed an action of the Commission unless and until the Commission shall specifically approve the same.

E. In the absence of any commissioner, his vote may be cast by another representative or commissioner of his state provided that said commissioner or other representative casting said vote shall have a written proxy in proper form as may be required by the Commission.

F. The Commission shall elect annually from among its members a chairman and vice-chairman. The Commission shall appoint an Executive Director who shall also act as secretary-treasurer, and who shall be bonded in such amount as the Commission may require. The Executive Director shall serve at the pleasure of the Commission and at such compensation and under such terms and conditions as may be fixed by it. The Executive Director shall be custodian of the records of the Commission with authority to affix the Commission's official seal and to attest to and certify such records or copies thereof.

G. The Executive Director, subject to the approval of the Commission in such cases as its by-laws may provide, shall appoint and remove or discharge such personnel as may be necessary for the performance of the Commission's function. Subject to the aforesaid approval, the Executive Director may fix their compensation, define their duties, and require bonds of such of them as the Commission may designate.

H. The Executive Director, on behalf of, as trustee for, and with the approval of the Commission, may borrow, accept, or contract for the services of personnel from any state or government or any subdivision or agency thereof, from any inter-governmental agency, or from any institution, person, firm or corporation; and may accept for any of the Commission's purposes and functions under this compact any and all donations, gifts, and grants of money, equipment, supplies, materials, and services from any state or government of any subdivision or agency thereof or inter-governmental agency or from any institution, person, firm or corporation and may receive and utilize the same.

I. The Commission may establish and maintain one or more offices for the transacting of its business and for such purposes the Executive Director, on behalf of, as trustee for, and with the approval of the Commission, may acquire, hold and dispose of real and personal property necessary to the performance of its functions.
J. No tax levied or imposed by any party state or any political subdivision thereof shall be deemed to apply to property, transactions, or income of the Commission.

K. The Commission may adopt, amend and rescind by-laws, rules and regulations for the conduct of its business.

L. The organization meeting of the Commission shall be held within six months from the effective date of the compact.

M. The Commission and its Executive Director shall make available to the party states any information within its possession and shall always provide free access to its records by duly authorized representatives of such party states.

N. The Commission shall keep a written record of its meetings and proceedings and shall annually make a report thereof to be submitted to the duly designated official of each party state.

O. The Commission shall make and transmit annually to the legislature and Governor of each party state a report covering the activities of the Commission for the preceding year and embodying such recommendations as may have been adopted by the Commission. The Commission may issue such additional reports as it may deem desirable.

ARTICLE V

A. The members of the Commission shall serve without compensation, but the expenses of each commission shall be met by the state which he represents in accordance with the law of that state. All other expenses incurred by the Commission in the course of exercising the powers conferred upon it by this compact, unless met in some other manner specifically provided by this compact, shall be paid by the Commission out of its own funds.

B. The Commission shall submit to the executive head or designated officer of each party state a budget of its estimated expenditures for such period as may be required by the laws of that state for presentation to the legislature thereof.

C. Each of the Commission's budgets of estimated expenditures shall contain specific recommendations of the amount or amounts to be appropriated by each of the party states. Detailed commission budgets shall be recommended by a majority of the votes cast, and the costs shall be allocated equitably among the party states in accordance with their respective interests.

D. The Commission shall not pledge the credit of any party state. The Commission may meet any of its obligations in whole or in part with funds available to it under Article IV(H) of this compact, provided that the Commission takes specific action setting aside such funds prior to the incurring of any obligations to be met in whole or in part in this manner. Except where the Commission makes use of funds available to it under Article IV(H) hereof, the Commission shall not incur any obligations prior to the allotment of funds by the party states adequate to meet the same.

E. The Commission shall keep accurate accounts of all receipts and disbursements. The receipts and disbursements of the Commission shall be subject to the audit and accounting procedures established under the by-laws. However, all receipts and disbursements of funds handled by the Commission shall be audited yearly by a qualified public accountant and the report of the audit shall be included in and become a part of the annual report of the Commission.
F. The accounts of the Commission shall be open at any reasonable time for inspection by such agency, representative of the party states as may be duly constituted for that purpose and by others who may be authorized by the Commission.

ARTICLE VI

The Commission shall have power to:

A. Collect, correlate, interpret, and report on data relating to the water resources and the use thereof in the Basin or any portion thereof.

B. Recommend methods for the orderly, efficient, and balanced development, use and conservation of the water resources of the Basin or any portion thereof to the party state and to any other governments or agencies having interests in or jurisdiction over the Basin or any portion thereof.

C. Consider the need for and desirability of public works and improvements relating to the water resources in the Basin or any portion thereof.

D. Consider means of improving navigation and port facilities in the Basin or any other portion thereof.

E. Consider means of improving and maintaining the fisheries of the Basin or any portion thereof.

F. Recommend policies relating to water resources including the institution and alteration of flood plain and other zoning laws, ordinances and regulations.

G. Recommend uniform or other laws, ordinances, or regulations relating to the development, use and conservation of the Basin's water resources to the party states or any of them and to other governments, political subdivisions, agencies of inter-governmental bodies having interests or in jurisdiction sufficient to affect conditions in the Basin or any portion thereof.

H. Consider and recommend amendments or agreements supplementary to this compact to the party states or any of them, and assist in the formulation and drafting of such amendments or supplementary agreements.

I. Prepare and publish reports, bulletins, and publications appropriate to this work and fix reasonable sales prices therefore.

J. With respect to the water resources of the Basin or any portion thereof, recommend agreements between the governments of the United States and Canada.

K. Recommend mutual arrangements expressed by concurrent or reciprocal legislation on the part of Congress and the Parliament of Canada including but not limited to such agreements and mutual arrangements as are provided for by Article XIII of the Treaty of 1909 Relating to Boundary Waters and Questions Arising Between the United States and Canada. (Treaty Series, No 548).

L. Cooperate with the governments of the United States and of Canada, the party states and any public or private agencies or bodies having interests in or jurisdiction sufficient to affect the Basin or any portion thereof.

M. At the request of the United States, or in the event that a Province shall be a party state, at the request of the Government of Canada, assist in the negotiation and formulation of any treaty or other mutual agreement between the United States and Canada with reference to the Basin or any portion thereof.
N. Make any recommendation and do all things necessary and proper to carry out the powers conferred upon the Commission by this compact, provided that no action of the Commission shall have the force of law in, or be binding upon, any party state.

ARTICLE VII

Each party state agrees to consider the action the Commission recommends in respect to:

A. Stabilization of lake levels.

B. Measures for combating pollution, beach erosion, floods and shore inundation.

C. Uniformity in navigation regulations within the constitutional powers of the states.

D. Proposed navigation aids and improvements.

E. Uniformity or effective coordinating action in fishing laws and regulations and cooperative action to eradicate destructive and parasitical forces endangering the fisheries, wildlife and other water resources.

F. Suitable hydroelectric power developments.

G. Cooperative programs for control of soil and bank erosion for the general improvement of the Basin.

H. Diversion of waters from and into the Basin.

I. Other measures the Commission may recommend to the states pursuant to Article VI of this compact.

ARTICLE VIII

This compact shall continue in force and remain upon each party state until renounced by the act of the legislature of such state, in such form and manner as it may choose and as may be valid and effective to repeal a statute of said state, provided that such renunciation shall not become effective until six months after notice of such action shall have been officially communicated in writing to the executive head of the other party states.

ARTICLE IX

It is intended that the provisions of this compact shall be reasonably and liberally construed to effectuate the purposes thereof. The provisions of this compact shall be severable and if any phrase, clause, sentence or provision of this compact is declared to be contrary to the constitution of any party state or of the United States, or in the case of a Province, to the British North America Act of 1867 as amended, or the applicability thereof to any state, agency, person or circumstances is held invalid, the constitutionality of the remainder of this compact and the applicability thereof to any state, agency, person or circumstance shall not be affected thereby, provided further that if this compact shall be held contrary to the constitution of the United States, or in the case of a Province, to the British North America Act of 1867 as amended, or of any party state, the compact shall remain in full force and effect as to the remaining states and in full force and effect as to the state affected as to all severable matters.
STATE LEGISLATIVE HISTORY:

Illinois: (69th GA House Bill, No. 983, 1955)
Indiana: (Chapter 220 (H. 216, Approved March 10, 1955)
Minnesota: (Laws of Minnesota 1955, Chapter 691; S.F. No. 1982)
New York: (Chapter 643, Laws of 1960)
Ohio: (Amended House Bill 415, Effective October 9, 1963, 105 General Assembly)
Wisconsin: (No. 294 A, Chapter 275, Laws of 1955)

The Commission was officially organized and established December 12, 1955 subsequent to ratification of the compact by five states (Illinois, Indiana, Michigan, Minnesota and Wisconsin). The Commission office was established on the Campus of the University of Michigan in early 1956.

CONGRESSIONAL CONSENT - LEGISLATION

All interstate compacts require Congressional consent (Article I, Sec. 10, Clause 3, Constitution of the United States) in order to achieve full force and effect. Numerous bills were considered beginning in 1956. In 1968, Congress enacted S. 660 (PL 90-419) giving limited consent to the compact as follows:

"Public Law 90-419
90th Congress, S 660
July 24, 1968"

"AN ACT

"Granting the consent of Congress to a Great Lakes Basin Compact, and for other purposes.

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of Congress is hereby given, to the extent and subject to the conditions hereinafter set forth, to the Great Lakes Basin Compact which has been entered into by the States of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin in the form as follows:
"GREAT LAKES BASIN COMPACT"

(The full text of the State adopted Compact text is included in PL 90-419 at this point.)

"SEC. 2. The consent herein granted does not extend to paragraph B of article II or to paragraphs J, K, and M or article VI of the compact, or to other provisions of article VI of the compact which purpose to authorize recommendations to, or cooperation with, any foreign or international governments, political subdivisions, agencies or bodies. In carrying out its functions under this Act the Commission shall be solely a consultative and recommendatory agency which will cooperate with the agencies of the United States. It shall furnish to the Congress and to the President, or to any official designated by the President, copies of its reports submitted to the party states pursuant to paragraph O of article IV of the compact.

"SEC. 3. Nothing contained in this Act or in the compact consented to hereby shall be construed to affect the jurisdiction on, powers, or prerogatives of any department, agency, or officer of the United States Government or of the Great Lakes Basin Committee established under title II of the Water Resources Planning Act, or of any international commission or agency over or in the Great Lakes Basin or any portion thereof, nor shall anything contained herein be construed to establish an international agency or to limit or affect in any way the exercises of the treatymaking power or any other power or right of the United States.

"SEC 4. The right to alter, amend, or repeal this Act is expressly reserved. "Approved July 24, 1968."

FEDERAL LEGISLATIVE HISTORY:

PL 90-419 (90th Congress, S 660)
HOUSE REPORT No 1640 (Comm. on Foreign Affairs)
SENATE REPORT No. 1178 (Comm. on the Judiciary)
CONGRESSIONAL RECORD, Vol. 114 (1968):
  June 12: Considered and passed Senate.
  July 15: Considered and passed House.
  July 24: Signed by the President.
BYLAWS

Pursuant to the powers and authority vested in the Great Lakes Commission by paragraph K of Article IV of the Great Lakes Basin Compact, the following Bylaws are adopted and shall remain in force until amended.

ARTICLE I
COMPONENT STATES

The states of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin having ratified the Great Lakes Basin Compact by act of their legislatures are recognized as the component states of this Compact which has become operative in view of the provisions of Article II, section A of this Compact. The provinces of Ontario and Québec, by actions of their governments through a Declaration of Partnership, are recognized as associate (non-voting) members of the Compact.

ARTICLE II
MEMBERSHIP

SECTION 1 - The members appointed by and certified to the Commission by the component states shall constitute the members of the Commission.

SECTION 2 - Pursuant to the provisions of the Compact, each state shall have a total of three votes on any matters coming before the Commission to be cast in accordance with the applicable laws of such state. Should any Commission or any committee, special committee, or task force member be absent from any Commission or committee, special committee or task force meeting, their vote may be cast by a duly appointed proxy in accordance with Article IV, Section E of the Compact, whose authority shall be in writing and filed with the Chair of the Commission or committee, as the case may be, at the time of or before said meeting.

SECTION 3 - Each state or the Commission itself shall be permitted to make use of advisors and consultants of its own choice at any meeting of the Commission or of any committee, special committee or task force. Such advisors and consultants may be permitted to participate in discussions and deliberations without the power to vote.

SECTION 4 - The Commission shall be permitted to designate observers representing the United States and Canadian federal governments, regional organizations, or any others it may so designate to advance the goals and objectives of the Great Lakes Basin Compact. Observers may be permitted to participate in discussions, deliberations and other activities as approved by the Commission, but shall have no vote.
ARTICLE III
BOARD OF DIRECTORS

SECTION 1 - There is established a Board of Directors (hereafter referred to as “the Board”) to be composed of a Commissioner from each component state. The governors of each state, where not inconsistent with state law, shall designate the person who shall serve on the Board. The Chairs of the Ontario and Québec delegations to the Commission shall serve in an associate (non-voting) capacity on the Board. The Chair and Vice Chair of the Commission shall be elected by the Commission from among the state delegation members and, upon election shall also be members of the Board. The Chair of the Commission shall also hold the title of Chairman of the Board.

SECTION 2 - The Board shall evaluate the work, activities, programs and policies of the Commission and shall recommend to the Commission the taking of any action by the Commission relative to such areas. It shall also serve in an advisory capacity to the Chair and Vice Chair of the Commission and shall perform such other duties and functions as the Commission shall delegate to it or otherwise authorize it to perform from time to time on behalf of the Commission. It shall meet on the call of the Chair.

SECTION 3 - The Board shall adopt budget(s) following review by the full Commission in accordance with Article VII. Pursuant to Section 8, Article VII, the Board shall authorize, by majority vote of members present, the adoption of changes to the general operating budget of the Commission. The Board may authorize increases or decreases of the budget by majority vote of members present. Alterations within previously approved amounts of spending categories, not changing the general operating budget amount, may be adopted by majority approval of the Board members present.

SECTION 4 - The Board shall, from time to time, review the personnel policies of the Commission and receive recommendations from Commissioners and the President/Chief Executive Officer on these personnel policies. The Board may authorize changes to the Commission’s "Personnel Policies and Procedures" and authorize changes in compensation for the President/CEO and staff personnel within available budget amounts. Compensation includes salary and fringe benefits available to staff.

SECTION 5 - The Board shall review proposed policies that are prepared for consideration by the Commission and shall report to the full Commission on the findings of the review and provide recommendations on adoption or suggested changes.

SECTION 6 - The Board shall report on all Board meetings at the next regularly scheduled or special Commission meeting. Draft minutes of Board meetings will be furnished to all Commissioners as soon as possible.

SECTION 7 - Board meetings will be held as needed, including by conference call or in conjunction with full Commission meetings to conserve travel costs to the extent practical for member states. Board meetings shall be open to all Commissioners as observers. All meetings will be announced to the entire membership. Board decisions will be made on the basis of a majority vote of those present.

SECTION 8 - The Board will act on Commission policy and budget matters in accordance with the following guidelines:
a) The Commission at a special or regularly scheduled meeting, refers the issues to the Board for action. All Commissioners may participate in discussions, but only Board members will be entitled to vote on the issue.

b) The Commission is unable to adequately resolve an issue (e.g., additional research, discussion or coordination is required, in a timely manner not available to the full Commission.) The Board may receive a referral from the Commission, or the Chair, and after discussion with the Vice Chair and President/CEO, may notify all Commissioners that an issue has been referred to the Board for action and resolution. Any objections shall be considered by the Chair. Other Commissioners desiring to participate may do so through the Board member representing their state or province.

c) For issues in which circumstances require an immediate decision or action, the Chair, after discussion with the Vice Chair and President/CEO, may refer the issue to the Board when a full Commission meeting is not an option for resolution. The Chair will report on all action taken by the Board to the full Commission by regular mail or equivalent as soon as practicable.

SECTION 9 - There is established the position of Immediate Past Chair to be held by the departing Chair for the period of his/her successor’s tenure as Chair. The Immediate Past Chair may be designated, by the Chair in consultation with the Board, to undertake special activities as deemed appropriate.

SECTION 10 - The Chair may designate members of the Board to undertake other special responsibilities as deemed appropriate.

ARTICLE IV
OFFICERS

SECTION 1 - Nominations for Chair and Vice Chair of the Commission shall be made by a nominating committee appointed by the current Chair, and election shall be held at the annual meeting of the Commission. Election to each office shall be by majority vote and each state shall be entitled to three votes. The Chair and Vice-chair shall hold office for one year or until their successors are elected and qualified. In the event the office of Chair becomes vacant, nomination and election to fill the vacancy shall be effected at any meeting of the Commission after due notice to all Commissioners.

SECTION 2 - Chair: The Chair shall take office immediately following adjournment of the meeting at which elected. The Chair shall preside at all meetings of the Commission and of the Board from such time until a successor shall take office. The Chair shall appoint, or establish the process of appointing, the members of committees, special committees, and task forces. The Chair shall serve as a voting member of the Board.

SECTION 3 - Vice Chair: The Vice Chair shall act for the Chair in the event of the latter’s absence or disability. The Vice Chair shall serve as a voting member of the Board.

SECTION 4 - President/CEO: Subject to the general supervision of the Commission, the President/CEO shall be the full time executive officer of the Commission. The President/CEO shall be employed by the Commission and shall hold office at the pleasure of the Commission; and shall:

(a) Carry out its policies;

(b) Serve as editor of any Commission publication;

(c) Coordinate the activities of all committees, special committees and task forces;

(d) Arrange details and facilities, including secretarial and other services for all Commission and Committee meetings;

(e) Serve as ex-officio member without vote for all committees, special committees and task forces;
(f) Cause to be made a record of the proceedings of the Commission and Board and preserve the same in the headquarters office;
(g) Give notice of all meetings;
(h) Make recommendations on programs, policies, and activities of the Commission;
(i) Exercise general supervision under the direction of the Commission of all the Commission programs and activities;
(j) Have immediate charge of the headquarters office and personnel.

SECTION 5 - Executive Staff: The executive staff of the Commission shall consist of President/CEO and such other staff members as may be designated by a majority vote of the Board from time to time.

ARTICLE V

COMMITTEES

SECTION 1 - The Commission may, from time to time and as deemed necessary, delineate committees, special committees, and task forces to carry out its initiatives. Each committee, special committee, or task force shall consist of persons from each interested state and province, nominated by the Chair of the delegation and appointed by the Chair. Each state shall be entitled to one vote on each committee, special committee and task force. In addition, the Chair of each committee, special committee or task force may arrange for associates or advisors, without payment of compensation or expenses to the same unless authorized by the Commission, to assist the committee, special committee or task force and participate in its deliberations and discussions without power to vote on recommendations.

SECTION 2 - The committees, special committees, and task forces shall conduct studies and research, prepare memoranda and reports in their assigned fields and on that basis make recommendations to the full Commission for specific action to be taken in a particular field. Any and all action on legislative recommendations of a committee, special committee or task force other than discussion, study and voting will be made only with the approval of the Commission.

SECTION 3 - Each committee, special committee or task force shall meet as needed to conduct assigned duties. Through its Chair, or the Chair’s designee, each committee, special committee or task force shall periodically submit a written report to the Commission at regular annual meetings of the Commission or at other times as deemed appropriate. Recommendations by the committees, special committees and task forces calling for action by the Commission shall be received in writing by the Chair of the Commission and the President/CEO at least one month prior to the date of the meeting of the Commission at which such action is to be sought, unless special permission is granted by the Commission Chair for a late report.

ARTICLE VI

MEETINGS

SECTION 1 - Annual and semiannual meetings: The Commission shall meet at least twice annually. The annual meeting normally shall be held during the month of October; the semi-annual meeting normally shall be held during the second half of the fiscal year (January – June). The Chair shall consider recommendations and invitations of Commissioners in selecting meeting locations, and views on conditions which tend to over-ride the normally established meeting dates.

SECTION 2 - Notice: The President/CEO shall mail notice in writing of the time and place of each regular meeting of the Commission to each member not later than 60 days prior to the date of the meeting.
SECTION 3 - Special meetings: Special meetings of the full Commission may be called by the Chair to be held at times and places identified in an official call for such meetings.

SECTION 4 - Order of business and rules: The order of business which may be developed by Bylaws, tradition or ruling of the presiding officer of the Commission or Board may be changed at any meeting of the body proposing a change in its order of business by vote of a majority of members present, except as otherwise provided by the Compact or the Bylaws. The usual applicable parliamentary rules and precedents will govern all proceedings.

ARTICLE VII
BUDGET AND FINANCE

SECTION 1 - All component states shall share equally in the expenses of the Commission. Each individual state shall bear the expenses of its Commissioners at Commission annual, semiannual and Board meetings, and such expenses shall not be paid out of funds in the Commission treasury.

SECTION 2 - In the case of committee, special committee or task force programs the Commission may authorize the payment of expenses of committee, special committee or task force members from Commission funds.

SECTION 3 - Financial remittances to the Commission by each member state shall be requested for each fiscal year. The amount of each remittance shall be determined by the Commission in accordance with Sections 1, 6, 7 and 8, this Article and Article V of the Compact.

SECTION 4 - The President/CEO shall, on a quarterly basis, prepare and submit to the Board a statement presenting the Commission’s financial condition.

SECTION 5 - With the approval of the Board, the President/CEO may make transfers of funds within the approved budget of the Commission.

SECTION 6 - The budget of estimated expenditures referred to in Article V of the Compact shall be adopted by the Board prior to the relevant fiscal year, and presented at the next meeting of the Commission.

SECTION 7 - The budget of the Commission shall consist of two parts:

a) The "general operating budget" shall include, but not be limited to funds remitted by each member state, Commission reserve funds and interest earned. Expenditures will normally include routine operating costs for the Commission.

b) The "restricted fund budget" shall include income from projects, grants and other sources not considered as a routine revenue. Expenditures will normally be made to fund costs of the projects or grants incurred by the Commission. Transfers to pay Commission operating expenses may be made in accordance with grant or project authorization.
SECTION 8
a) The President/CEO shall prepare a proposed annual budget for review and evaluation by the Board at least 45 days prior to the new fiscal year. The proposal shall include estimated income and expenditures for each part of the budget.
b) The Board will make necessary changes to the proposal, will distribute a draft budget to the full Commission for review, and following consultation with the full Commission will adopt a final budget document. The general operating budget component shall be used to determine the financial remittance required by each member state. Only a majority vote by the full Commission shall authorize a change in a member state’s required financial remittances.

SECTION 9 - Certain changes and alterations are expected to occur within the approved budget. These will be handled as follows:

a) Changes in the general operating budget, not requiring a change in required member state remittances, may be made by majority vote of the Board or by a majority vote of the full Commission.
b) Changes in the restricted fund budget, not amending the general operating budget, may be adopted by a majority vote of the full Board or by a majority vote of the full Commission.
c) Changes in the budget, requiring alterations in the required member state remittance will only be authorized by majority vote of the full Commission.
d) Changes in the budget requiring immediate action, where a Board or full Commission meeting is not possible, may be made by the President/CEO in consultation with the Chair or Vice Chair, as available. A subsequent report to, and ratification by, the Board or Commission, as appropriate, will be sought.

ARTICLE VIII
AMENDMENT OF BYLAWS

These Bylaws may be altered and amended at any regular meeting upon the affirmative majority vote of the Commission. However, no amendment may be considered at any such meeting unless the proposed amendment shall have been received by the Chair and President/CEO at least one month prior to the first day of the month of which said regular meeting shall be held. Immediately upon receipt of such proposed amendment the President/CEO shall refer it to the Board and shall send a copy thereof to each member of the Commission within fifteen days after the receipt thereof, together with notice of the date on which the proposed amendment will be acted upon by the Commission.

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James M. Tierney, Immediate Past Chair, New York

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Vacant, Indiana
Jon W. Allan, Michigan
Lt. Gov. Yvonne Prettner Solon, Minnesota
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