

Great Lakes Executive Committee Meeting Summary
December 9-10, 2020

FIRST NATIONS OPENING/WATER CEREMONY

The December 2020 Great Lakes Executive Committee (GLEC) meeting was opened by Laureen (Blu) Waters. Laureen provided inspirational words through a water ceremony and blessing to set the stage for discussions.

OPENING REMARKS

Canadian Great Lakes Executive Committee (GLEC) Co-Chair, Michael Goffin (Environment and Climate Change Canada, ECCC) welcomed everyone to the December 2020 GLEC meeting and made note of meeting participants' efforts in continuing work towards the restoration and protection of the Great Lakes during the Coronavirus pandemic. Mike also highlighted initial planning for the 2022 Great Lakes Public Forum in conjunction with the opportunity to celebrate the 50th Anniversary of the Great Lakes Water Quality Agreement.

Kurt Thiede (U.S. Environmental Protection Agency, EPA) also provided words of welcome and highlighted that progress to protect and restore the Great Lakes continues to be achieved despite the challenges faced this past year. Examples such as finalizing the delisting of the Lower Menominee River Area of Concern (AOC) and bringing the total number of U.S. AOC delistings to five; and removing Beneficial Use Impairments at seven AOCs were highlighted. Kurt also made note of the new, aggressive Great Lakes Action Plan III, which will continue to guide the actions of federal agencies and many partners over the next four years towards the Great Lakes and fueling local and regional economies and community revitalization efforts across the basin. Kurt concluded by noting that EPA is celebrating not only the agency's 50th anniversary, but also the 10 year anniversary of the Great Lakes Restoration Initiative and that he is very proud of the progress made in EPA region 5.

A list of meeting attendees can be found in Appendix A.

A TRIBUTE TO ELDER, GRANDMOTHER AND WATER WALKER JOSEPHINE MANDAMIN

Autumn Peltier, great-niece to late Grandmother Josephine Mandamin, and Anishinabek Nation Chief Water Commissioner, provided a tribute to her late grandmother. Autumn shared stories of the humble beginnings of her Grandmother as the Water Walker; the initial work that solidified this movement; her Grandmother's commitment to, and love for, the water; her Grandmother's impact on the many people along the many shorelines; and all the support received. Autumn concluded with some words from her Grandmother, "... to keep doing the work... and don't let anyone stop you keep loving the water." The tribute touched the hearts of meeting participants.

BUSINESS ITEMS

Barb Sweazey (Stratos Inc.) walked through the virtual housekeeping protocols for the meeting, followed by Michael Goffin who sought approval of the agenda by meeting participants. With no adjustments to the agenda, the meeting commenced to the first session related to Areas of Concern.

AREAS OF CONCERN SESSION

Areas of Concern (AOC) Annex Co-Leads, Kate Taillon (ECCC) and Marc Tuchman (EPA), highlighted recent progress in restoring Beneficial Uses and Canadian and U.S. Areas of Concern, work undertaken over the past six months and plans for future work. Kate provided updates of the removal of six Beneficial Use Impairments (BUIs) over the past several months; highlighted sediment work in Randle Reef and Thunder Bay North Harbour; infrastructure work in Toronto and Hamilton Harbour; and future work to engage on, and assess, the status of BUIs in six AOCs. Marc spoke to work over the past several months, including the delisting of the Lower Menominee AOC; the removal of six BUIs; the completion of all management actions in Black River and Eighteenmile Creek AOCs; and multiple Great Lakes Legacy Act sediment remediation projects underway or completed. Marc also highlighted future work regarding the removal of an anticipated six BUIs; the proposed completion of all management actions in Buffalo River and Muskegon River AOCs; multiple sediment remediation and habitat restoration projects; and continued progress on Ashtabula River delisting.

Following the Co-Leads' updates, Kate Golden (City of Lorain) presented on the success of the Black River AOC Reclamation Site Restoration Project in addressing industrial historical contamination and improving habitat and water quality in the Black River. Kate spoke to the scope of the work and the cap and cover of approximately 40 acres of slag and steel by-products, as well as visually demonstrated the state before, and the results after the work. She concluded noting that the areas directly contributing runoff to river have been capped and covered with no direct constituent runoff; that wildlife are beginning to utilize the area; and that monitoring work for BUI removal is ongoing.

LAKEWIDE MANAGEMENT SESSION

Lakewide Management Annex Co-Leads, James Schardt (EPA) and Sean Backus (ECCC) spoke to the drafting the 2020-2024 Lake Superior Lakewide Action and Management Plan (LAMP) and finalizing of the science priorities; the drafting of the 2020-2024 Lake Michigan LAMP; and the finalizing of the 2019-2023 Lake Erie LAMP. Co-Leads also highlighted discussed the work by the Lake Huron Partnership in engaging the broader scientific community to support the development of future science priorities, as well as future work to draft the next Lake Huron LAMP and finalize the science priorities. Lastly, Co-Leads discussed implementing actions identified in the Draft 2018-2022 Lake Ontario LAMP and supporting development of the International Association for Great Lakes Research's (IAGLR) 2021 State of Lake Ontario conference; and future work to continue these efforts and engage the broader scientific community to support the development of future science priorities.

Following the Co-Leads' updates, Thomas Swinford (Indiana DNR) presented restoration efforts in Indiana's Lake Michigan watershed focusing on the restoration of sand savannas at Dunes Nature Preserve, Indiana Dunes State Park, including restoration steps and results, as well as highlighting Indiana's Dune and Swale hydrologic investigation.

Eric Cleland (Nature Conservancy of Canada) then spoke to the collaborative efforts to restore biodiversity in Long Point's coastal wetlands through invasive phragmites control, including aerial treatment with GPS tracking and herbicide application; ground treatment; post-herbicide treatment with cutting/rolling and prescribed burn; monitoring of their work; and results from the successful restoration efforts.

CHEMICALS OF MUTUAL CONCERN SESSION

Chemicals of Mutual Concern Annex Co-Lead, Lisa Sealock (ECCC), provided an overview of annex activities over the past several months, including finalizing revisions to the Binational Screening Criteria for Nominated Chemicals of Mutual Concern (CMCs), based on comments received during the public comment period. Lisa also provided a highlight of future annex work, including work towards CMC strategies; approval of the Binational Screening Criteria for Nominated Chemicals of Mutual Concern; as well as tracking the implementation of actions in the binational strategies for CMCs.

Chris Korleski (EPA) then provided some remarks as the U.S. GLEC Co-Chair noting the transition in the U.S. Federal Government, as well as highlighting the focus of U.S. efforts and resources on AOCs, nutrients, habitats, and Asian carp as a priority and the need now to examine how to move forward on the U.S. work under the Chemicals of Mutual Concern Annex.

Satyendra Bhavsar (Ontario Ministry of the Environment, Conservation and Parks, MECP) then provided an overview of Ontario's fish monitoring program in relation to CMCs and findings from the program, including reductions in mercury emissions, a decline in polychlorinated biphenyls and polybrominated diphenyl ether levels.

Steve Corsi (United States Geological Survey) then spoke to multi-agency efforts to identify chemicals and chemical mixtures of ecological concern in U.S. Great Lakes tributaries, including surveillance efforts in the tributaries (water, sediment, pore water, tissues, chemistry and biological effects) with 659 chemicals monitored with 365 chemicals detected; the prioritization strategy and prioritizing of the chemicals through a risk-based chemical evaluation approach and noting the top 50 chemicals; as well as the work to analyze chemical mixtures.

NUTRIENTS SESSION

Nutrients Annex Co-Leads, Tricia Mitchell (ECCC) and Santina Wortman (EPA) spoke to the annex work in the eastern basin of Lake Erie, as well highlights from work in the rest of Lake Erie and Lake Ontario.

They noted that the Eastern Basin Task Team, convened in 2020, examined the viability of setting science-based numeric targets for the eastern basin of Lake Erie. While the understanding of Cladophora has improved since 2016, additional knowledge gaps were present, which were presented. The consensus was that the science does not support the development of phosphorus loading or Cladophora targets for the eastern basin at this time. Next steps were identified, including: examining models in spring 2021; running models to determine impact of phosphorus reduction scenarios under existing targets; continuing monitoring and research focusing on identified gaps; revisiting the viability of setting target for eastern basin in 2023; as well as updating and continuing implementation of watershed plans,

and continue work on reducing eastern basin phosphorus loads.

Co-Leads also noted that the 2020 bloom was milder than predicted and that the loads for 2020 will have higher degree of uncertainty as there was limited water quality monitoring due to COVID-19. Co-Lead also spoke to the Lake Ontario science assessment, which is underway; and noted future work, including: the development of the adaptive management framework; the planning of a hypoxia workshop for winter 2021; and an upcoming binational Lake Erie webinar in January 2021.

Joy Mulinex (Ohio Lake Erie Commission) then discussed the [H2Ohio Initiative](#) in western Lake Erie and the investment in targeted solutions to address harmful algal blooms in eastern Lake Erie and help ensure safe and clean water for Ohioans. Accomplishments and activities highlighted included efforts to reduce phosphorus; create wetlands; address failing septic systems; address contaminants like lead; and monitoring

DISCHARGES FROM VESSELS SESSION

Canadian Annex Co-Lead, Shannon Seko (Transport Canada, TC) spoke to Transport Canada's consideration of comments regarding the Canadian draft ballast water regulations, as well as reviewing and monitoring related U.S. developments. Shannon also noted Canadian science activities undertaken by Fisheries and Oceans Canada regarding new technologies analyzing smaller and larger size classes of organisms in ballast water, and examining the effect of different ballast water management strategies.

U.S. Annex Co-Lead, Lorne Thomas (United States Coast Guard, USCG) then spoke to U.S. Coast Guard Type Approval of Ballast Water Management Systems and that 44 applications, to date, for type approval have been received and 37 systems have been approved. Lorne also provided updates on the U.S. Vessel Incidental Discharge Act (VIDA) including EPA's published "[Vessel Incidental Discharge National Standards of Performance](#)" proposed rule for comments; and the Coast Guard's implementation, compliance and enforcement of the requirements under EPA's national performance standards.

Following the Co-Leads' updates, Jack Faulk (EPA) provided further details regarding the EPA's Proposed National Standards of Performance under VIDA. Jack noted that the EPA Standards under VIDA, developed in consultation with the U.S. Coast Guard and U.S. states, are generally, as stringent as the 2013 Vessel General Permit; are technology-based; are numeric, best management practices, or a combination; and may distinguish between vessel class, type, size, and age. Jack highlighted the general discharge standards and discharge-specific standards (Ballast Tanks, Exhaust Gas Emission Control, Graywater, Hulls and Associated Niche Areas, Seawater Piping); highlighted state procedures and general state authorities; and highlighted the comments received on proposed Ballast Water National Standards.

AQUATIC INVASIVE SPECIES SESSION

Aquatic Invasive Species Co-Leads, Gavin Christie (Fisheries and Oceans Canada, DFO) and Aaron Woldt (United States Fish and Wildlife Service) noted that planned work for 2020 was directly impacted due to the pandemic restricting many field monitoring actions and in-person technical and coordination meetings. They provided highlights of activities over the past several months and planned future work,

including: development of a Federal U.S. and Canadian interagency mutual aid framework for early detection and rapid response to address Great Lakes invasive species; efforts to prevent introductions of new invasive species, including Asian carp; response actions by DFO to a Grass Carp capture and future coordinated action to control reproducing Grass Carp in the western basin of Lake Erie; control efforts for established invasive species; and efforts to examine technology to prevent the spread of aquatic invasive species.

Following the Co-Leads' presentation, Jill Wingfield (Great Lakes Fishery Commission, GLFC) spoke to a project led by the Great Lakes Law Enforcement Committee, with other project partners, to undertake a legal assessment of variability in regulated species lists and related authorities, and identify priority actions to address identified gaps and vectors of concern. The efforts involve developing a comprehensive comparison of existing regulations; undertaking analysis of key pathways; and identifying gaps and variabilities with Great Lakes management agencies.

Cecilia Weibert (Great Lakes Commission) then spoke to advancing understanding of the risks posed by live trade as pathways for invasion in the Great Lakes and the work of the [Great Lakes Panel on Aquatic Nuisance Species Organisms in Trade Ad Hoc Committee](#), established in 2019. Cecilia focused on one of the many activities of the Committee, "Organisms in Trade-focused symposium or webinar series". The symposium or webinars are aimed at advancing knowledge and understanding of organisms in trade (OIT) invasion pathway, with a series of 3 virtual sessions planned for 2021. The first session will focus on law enforcement and program perspectives on OIT; the second session will be on industry perspectives; and the third session will bring together lessons learned and outcomes from the previous sessions. The outcomes from the sessions will be rolled into subsequent committee activities and used to inform future work.

INTERNATIONAL JOINT COMMISSION TRIENNIAL ASSESSMENT OF PROGRESS REPORT

Jane Corwin (International Joint Commission, IJC) spoke to the release of the IJC's 2020 Triennial Assessment of Progress Report (to be released on December 10th), which assesses progress under the 2012 Canada-U.S. Great Lakes Water Quality Agreement over the period from 2017 to 2019. The report also summarizes public input on the 2019 Progress Report the Parties, as well as what the IJC heard during their public engagement sessions, and offers analysis and commentary on the effectiveness of select government program and activities related to climate change, nutrients, and public engagement.

HABITAT AND SPECIES SESSION

Habitat and Species Annex Co-Leads, Sean Backus (ECCC) and Lori Nordstrom (U.S. Fish and Wildlife Service) discussed numerous annex activities over the past several months and plans for future work:

- Completion of a 2020 Canadian Lake Erie Baseline Coastal Habitat Survey: Technical Addendum, a user-friendly Canadian Lake Erie Coastal Habitat Lakewide Summary and a data catalogue. As well as Canadian mapping and delineation work for Lake Ontario, Lake Huron and Georgian Bay. Future work towards a "2021 Canadian Lake Ontario Baseline Coastal Habitat Survey: Technical Addendum," a user-friendly Lake Erie summary report, mapping and delineation of Lake Superior, and publishing spatial data on an Open Data Catalogue was highlighted.
- Work under the U.S. "Coastal Assembly" to develop a path forward for a baseline coastal wetland habitat survey and establish targets of net habitat gain for U.S. coastal wetlands.

- Modelling work (e.g., downscaled climate projections, seasonal wave and water-level conditions for the southern Great Lakes to the end of the 21st century; wetland changes for the Detroit River and the north shore of Lake Erie; a spatial assessment of coastal wetland adaptive capacity).
- Future work of coastal wetland vulnerability modelling for 20 sites along Canadian shores.
- Development, in Canada, of adaptation strategies, measures and actions for coastal wetland resilience with scientific experts from government, academia and non-governmental organizations.
- Development, in the U.S., of menus of climate change adaptation strategies and approaches for consideration by coastal conservation stakeholders in their planning, design, implementation, and monitoring of coastal restoration projects in Great Lakes coastal areas. Strategies and approaches are being identified along with more-specific approaches and actions within the strategies. A fact sheet that describes the need for, purpose and key aspects of the menu will be distributed to coastal conservation stakeholders; and the menus and associated tools will be made available in 2021-2022 to binational Great Lakes coastal resource managers and stakeholders.
- Other efforts to protect, enhance and restore habitat were highlighted (e.g., purchase of St. Luke's Marsh; implementation of the Ontario Eastern Habitat Joint Venture; the U.S. Fish and Wildlife Service's Coastal Program; characterization of spring and fall bird migration through the basin).

Following the Co-Leads' update, Kevin O'Donnell (EPA) discussed a few Great Lakes Restoration Initiative habitat and species success stories, including: the ability of over 1,000 acres of former agriculture land that had been restored back into wetlands in 2016, which helped lessen the flooding impacts during the Saginaw River watershed flood in May 2020; comprehensive population recovery efforts for Great Lakes Piping plovers; Lake trout propagation and stocking; and Binational Coastal Wetland Monitoring documenting Great Lakes coastal wetland quality and variability, spanning historic high to low water levels.

Julie Simard (Ontario Ministry of Natural Resources and Forestry) then provided further details of the Canadian Baseline Coastal Habitat Survey, which includes the coastal ecosystem from Sarnia to the Niagara River, from the high water mark to 2 km inland, with the project currently sampling 16 coastal units along Lake Erie. Julie highlighted select results from the Lake Erie survey and the applicability of the results to inform key management questions and decision making through (1) a management-relevant and public friendly lakewide summary that addresses relevant management questions; (2) a technical addendum that establishes a standardized approach for future replication to track habitat net gain and or loss; and (3) an open data catalogue.

GROUNDWATER SESSION

Groundwater Annex Co-Leads, Mohamed Mohamed (ECCC) and Howard Reeves (U.S. Geological Survey, USGS), spoke to the updating of the 2016 Groundwater Science Report, which summarized the role of groundwater in both protecting the water quality of the Great Lakes and in providing a pathway for contaminants to potentially degrade water quality. The update to the 2016 report will updating the chapters from the 2016 report, assessing previously identified gaps and needs, and identifying needs not in the earlier report. An outline was presented for the updated report, which is expected to be released in April 2022.

Martha Nielsen (USGS) then provided an overview of a USGS Lake Superior groundwater data project, which supports addressing questions of how groundwater, does or does not, contribute to contamination around Lake Superior; quantifies the potential for groundwater to store, transport, and

deliver water and nutrients to the Great Lakes directly and through tributary waters; and helps inform decision making and science-based assessments of progress by understanding of how groundwater processes may help, hinder, or delay water quality improvements in the basin. Data used to evaluate patterns and trends in groundwater and surface water processes were also discussed (e.g., hydrologic data, water quality data, aquifer data, and previous groundwater models). Martha concluded with noting the two planned products for this study, including a report on the data analysis portion and GIS data to describe various groundwater related data, expected in 2022.

CLIMATE CHANGE IMPACTS SESSION

Climate Change Impacts Co-Leads, Shaffina Kassam (ECCC) and Jennifer Day (United States National Oceanic and Atmospheric Administration) provided updates related to activities undertaken in the past several months and planned future work, including: the publishing of the 2019 Annual Climate Trends Summary report, as well as the June and September 2020 Quarterly Climate Change Impacts reports; a new webinar series to increase engagement and information sharing; a Data Visualization Project, which will translate complex scientific materials into easy-to-understand materials; future development of high resolution (4 km by 4 km) climate data of the Great Lakes basin; and planning for a Climate Change Modelling Experts Workshop in March 2021, which will focus on physical modelling, impact modelling, translating information, and recommendations from last year's workshop.

SCIENCE SESSION

Science Annex Co-Leads, Ram Yerubandi (ECCC) and Elizabeth Hinchey Malloy (EPA), discussed annex activities over the past several months and future work, including: an update on Cooperative Science and Monitoring Initiative (CSMI) activities; binational discussions to identify opportunities to increase use of Traditional Ecological Knowledge (TEK) in GLWQA Annex activities; U.S. work to complete a Draft Guidance Document on TEK Pursuant to the GLWQA, as well as hosting of a Tribal Webinar in November and future work to include an online database with Great Lakes TEK references; and work towards the 2022 State of the Great Lakes (SOGL) reports, which included a discussion of improvements being examined for the suite of SOGL indicators.

Following the Co-Leads presentation, Steve Ruberg and Andrea VanderWoude (National Oceanic and Atmospheric Administration), followed by Caren Binding (ECCC), spoke to the application of new and novel monitoring techniques for Great Lakes monitoring, including: the Western Lake Erie Continuous Real-time Monitoring Network, which provides continuous real-time monitoring through the use of buoys that capture various parameters; autonomous underwater vehicles; cameras attached to planes with hyperspectral sensors, which are able to capture high resolution images to improve harmful algal bloom (HAB) forecasts and fills in the gaps of satellite data; multi-sensor analysis of satellite-derived Great Lakes water clarity over three decades, which records bright-water events such as algal blooms, suspended sediments and whiting events (in contrast to historic Secchi disk depth measurements); satellite earth observations (e.g., EOLakeWatch) for lake monitoring provide enhanced tools for monitoring and understanding factors that affect the water quality of Canadian lakes; and future work to undertake Lake Ontario submerged aquatic vegetation monitoring and Lake St. Clair HAB monitoring.

NEWS AND COMMENTS FROM GLEC MEMBERS

Michael Goffin (ECCC) provided an update on the creation of the Canada Water Agency Canada and noted that a discussion paper for consultation on the Agency and its roles will be available in January 2021.

David Nanang (DFO) highlighted that ten new aquatic species at risk have been listed and 9 previously listed aquatic species at risk were reclassified. David noted that recovery planning for these species are well underway and that DFO continues to provide support for species at risk recovery in the Great Lakes through Grants and Contribution programs. David also spoke to barriers and traps to block sea lamprey from migration and spawning which were successfully set up in March and April; and the successful application of lampricide within Garden River First Nation traditional territory in northern Ontario (one of the top three nesting rivers for sea lamprey for Lake Huron). David also noted that Asian carp early detection and early surveillance was conducted at 30 of the 37 sites in the Great Lakes – with one grass carp (diploid female) being captured in Jordan Harbour in Lake Ontario and no others were found over the four days of sampling.

Ling Mark (MECP), on behalf of Chloe Stewart, noted that in the fall, the Ministry launched a new competitive Great Lakes Local Action Fund to provide up to \$50,000 for community-based projects to restore and protect Great Lakes and tributaries. 121 applications from municipalities, Conservation Authorities, Indigenous communities and small businesses were received and are currently being reviewed. Successful applicants will be announced in the new year. Ling also spoke to the province's first multi-sector climate change impact assessment examining the impacts of infrastructure, food and agriculture, people and communities, natural resources, ecosystems and the environment, and business and the economy. The results of the climate change impact assessment are anticipated in 2022 and anticipate updating the knowledge of climate change impacts to the Great Lakes will help communities make more informed decisions.

Javier Laureano (EPA Region 2) noted that since the June 2020 GLEC, three Beneficial Use Impairments (BUIs) have been removed for Buffalo River, Rochester Embayment, and Eighteenmile Creek AOCs; and expect two more BUIs to be removed in Rochester Embayment AOC in the next 6 months. Javier also spoke to the progress with sediment and habitat work in the Niagara River AOC, as well as in the St. Lawrence River at Massena/Akwesasne AOC working with the St. Regis Mohawks Tribe. Javier also spoke to EPA Region 2 involvement and collaborative efforts related to: the Nutrients Annex's Lake Ontario Nutrient Objectives and Targets Task Team; a comprehensive database reflecting a portion of Lake Ontario's 2018 Cooperative Science and Monitoring Initiative (CSMI) results; and planning for the State of Lake Ontario Conference planned for March 2021.

Jim Clift (Michigan Department of Environment, Great Lakes, and Energy) noted the importance that the Great Lakes Restoration Initiative has played in supporting the Michigan Great Lakes program; complemented the federal agencies working with Michigan to achieve the GLWQA goals to date; appreciated Chris Korleski's comments regarding EPA placing greater priority on some of the annexes such as moving forward the Lakewide and Action Management Plans; and challenges due to COVID-19.

Carl Platz (U.S. Army Corps of Engineers) highlighted that the Corps continues to support the goal of completing sediment remediation and habitat restoration management actions that will lead to BUI removal and AOC delisting. In August 2020, the Corps was awarded a \$13.5M Legacy Act dredging and capping contract to remediate 132,000 cubic yards of contaminated material in Howard's Bay Wisconsin

in the St. Louis River AOC, and in September 2020 the Corps was awarded a \$4.1M contract to remove disposed contaminants from the eastern section of the Lake George Indiana Branch of the Grand Calumet River AOC. With respect to nutrients, Carl highlighted that the Corps is working with the Interagency Partnership to help understand and address legacy phosphorus in priority watersheds and that in August 2020, the Corps was awarded a contract to build a demonstration project in the Maumee River watershed, which includes features to keep permanently keep phosphorus to help achieve the 40% reduction goal for Lake Erie. With respect to aquatic invasive species, Carl highlighted that the Corps completed performance verification and in-water safety testing for the new permanent barrier 1 to control Asian carp at the Chicago Sanitary and Ship Canal, with the goal of moving to a full time activation of the barrier in the spring or summer of 2021; work with the State of Illinois on the design phase of the Brandon Road project; and that, in October 2020, the Corps awarded a construction contract for the [FishPass Project](#).

Eamonn Horan-Lunney (Great Lakes St. Lawrence Cities Initiatives) noted that the Cities Initiative is considering the possibility of having an in-person Annual General Meeting August 25-27, 2021, in St. Catharines, Ontario. Eamonn noted that the Cities Initiative continues to keep municipalities educated, engaged and fully aware of opportunities going on in the Great Lakes through efforts such as webinars focusing on science, programs, best practices and implications for municipalities. He noted that the issues regarding shoreline restoration, including water levels, erosion, best practices etc. and water equity and how to ensure everyone has access to safe and potable drinking water were being examined. The Cities Initiative will be initiating a survey in 2021 asking what municipalities need in order to be prepared to erosions, rising water levels, increased precipitation etc. Eamonn also made reference to research indicating the significance of economic stimulus for investment in activities that also benefit the Great Lakes environment.

COMMENTS PROVIDED FROM COMMISSION REPRESENTATIVES

Jim McKane (Great Lakes Fishery Commission, GLFC) spoke about the collaborative work and findings by the three commissions (GLFC, IJC and GLC) on an IJC-initiated report, "[Understanding Declining Productivity in the Offshore Regions of the Great Lakes](#)", which recommended enhancing collaboration among fishery and water quality managers. Jim also discussed the collaborative work by the three commissions with respect to the Invasive Mussel Collaboration (ICM) and leveraging the success of the ICM to support enhancing coordination as per the above IJC report recommendation. Lastly, Jim highlighted the GLFC letter to EPA Administrator Wheeler with respect to the Vessel Incidental Discharge Act, which reiterated that aquatic invasive species continue to represent one of the greatest threats to the Great Lakes and its fisheries and noted several concerns from the GLFC.

Lance Yohe (IJC) provided an overview of activities over the past six months and reports completed by the IJC Boards (Water Quality Board, Science Advisory Board, Health Professionals Advisory Board), including: [An Evaluation of Stressor Interactions in the Great Lakes](#); [Understanding Declining Productivity in the Offshore Regions of the Great Lakes](#); [Oversight of Animal Feeding Operations for Manure Management in the Great Lakes Basin](#); and [A Review of the Human Health Impacts of Selenium in Aquatic Systems](#). Looking to the next triennial cycle, Lance noted work towards the 50th Anniversary of the GLWQA in 2022, as well as examining how the GLWQA can best protect the Lakes over the next 50 years through projects such as an assessment of the GLWQA and the effectiveness of Domestic Action Plans and nutrient load reductions. Lance also noted that the Advisory Boards future-focused projects, including developing a science-driven early warning systems to anticipate and detect emerging

threats; a plan for a 10-year binational research and exploration program; and collaborating with Mohawk Council of Akwesasne to develop a fish consumption advisory framework so people can make safer and more informed choices when eating Great Lakes fish. Finally, Lance made note of the third Binational Great Lakes Poll to understand the attitudes and values of people around the basin with results being available next year, and the IJC work related to climate change impacts and extreme Great Lakes water levels including undertaking an expedited review of the IJC's plan of regulating Lake Ontario outflows ([Plan 2014](#)).

Erika Jensen (Great Lakes Commission, GLC) urged Canada and the U.S. to acknowledge the successes of the Agreement while also identify opportunities to strengthen the Agreement as its 50th Anniversary nears. Erika noted the need to address the impacts of a changing climate in the basin, and the work by the GLC to establish a Standing Committee on Climate Resilience. Erika highlighted the GLC's [Blue Accounting Initiative](#) and the work to assess the lessons learned over the pilot phase and tailoring the data and progress in a way that will better support decision-makers. She also encouraged the federal governments to work toward binationally compatible regulations, including advancing ballast water policies to protect the Great Lakes to prevent introduction and spread of aquatic invasive species and at the same time minimize economic impacts to vessel operators. Lastly, Erika noted an Invasive Mussel Collaborative demonstration control project in Lake Michigan that tested the application of Zequanox on an area important for fish spawning and identified changes in the underwater habitat.

COMMENTS FROM OBSERVERS

Lawrence Gunther (Blue Fish Canada) noted the importance of the interconnection between fish and water quality and the need for more engagement moving forward related to fish, their health, and their place in communities around the Great Lakes. Lawrence also highlighted their stakeholder consultations with Indigenous fishers, recreational anglers, boating and fishing industry, conservation groups and other stakeholders, and their findings of the economic, social and spiritual significance of the Canadian fishing industry.

Rupert Kindersley (Georgian Bay Association) commented that Ontario is not complying with the Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health. Rupert also commented on Ontario's reduction of environmental protections through changes to the Conservation Authorities Act facilitating development that may be detrimental to the environment, exempting forestry operation from the Species at Risk Act, and changes to the Toxics Reductions Act. Rupert highlighted that these were comments not only from the Georgian Bay Association but also referenced in the Ontario Auditor General's 2020 reports on the environment.

Lisa Janairo (Great Lakes-St. Lawrence Legislative Caucus) highlighted two major priorities for the Caucus in 2021 – nutrient management and helping coastal communities to become more climate resilient. It was noted that the Caucus has been collaborating with the Great Lakes Commission on both these issue over the past year, which included launching the Patricia Birkholz Institute for Great Lakes-St. Lawrence Policy in 2019, and in 2021 the Caucus and Commission will work together again to organize the second Birkholz Institute focusing on climate resilience. Lisa also noted that the Caucus will be hosting several web meetings in 2021 and the Annual Meeting (being planned for September 24-25, 2021 in Quebec City if travel resumes) which are open to the public. Lisa concluded by noting some changes to the Caucus – the end of the term of the current chair, Indiana Senator Ed Charbonneau, at the end of 2020;

the current vice chair, Robyn Gabel, who will succeed him in January 2021; and Jennifer Schultz becoming new vice chair.

Gail Hesse (National Wildlife Federation) acknowledged the value of calls between the Nutrients Annex Co-Leads and non-governmental organization and the amount of work undertaken to reduce nutrients entering Lake Erie. Gail commented that there are opportunities more structured engagement during the adaptive management phase for Lake Erie and suggested broadening the view of expertise and how it can contribute towards goals for Lake Erie, as well as taking a look at other models such as the Chesapeake Bay Program. The Chesapeake Bay Program has a strong culture of accountability with its inclusive management structure and collaborative decision making, which may be considered to improve transparency, stakeholder participation and decision making for the Nutrients Annex.

SUMMARY OF ACTION ITEMS

1. Lakewide Management Annex Co-Leads to follow-up on the need for binational Great Lakes-wide discussions at the Annex 2 Subcommittee.
2. EPA to assess past progress under the Chemicals of Mutual Concern Annex and, given available resources, look for ways to improve the implementation of the Annex.
3. Nutrients Annex Co-Leads to report back at June 2021 GLEC meeting with an update on the binational science in support of target setting for the Eastern basin of Lake Erie.
4. Groundwater Annex Co-Leads to report back at the June 2021 GLEC meeting on progress in drafting the update to the 2016 Groundwater Science report.
5. State of the Great Lakes (SOGL) Task Team Leads to continue work on updating the SOGL indicators for public release in 2022; and Science Annex Co-Leads to provide an update on COVID impacts to the 2021 field season at the June 2021 GLEC meeting.

MEETING WRAP UP

Dates for the next GLEC meeting were proposed as June 10-11, 2020 or June 24-25, 2020. GLEC was asked to inform the Secretariat if there were any known conflicts with these dates. [Due to conflicts noted, June 29-30, 2021 were later selected.]

GLEC MEETING PARTICIPANTS DECEMBER 9-10, 2020

1. Derek Ager	U.S. Environmental Protection Agency
2. Paul Allen	International Joint Commission
3. Jon Altenberg	
4. Janette Anderson	Environment and Climate Change Canada
5. Stephany Antonov	New York State Department of Environmental Conservation
6. Hannah Arbuckle	Great Lakes Indian Fish and Wildlife Commission
7. David Arquette	Haudenosaunee Environmental Task Force
8. Antonette Arvai	International Joint Commission
9. Sean Backus	Environment and Climate Change Canada
10. Richard Balla	U.S. Environmental Protection Agency
11. Edlynzia Barnes	U.S. Environmental Protection Agency
12. Rajesh Bejankiwar	International Joint Commission
13. Pierre Béland	International Joint Commission
14. Satyendra Bhavsar	Ontario Ministry of the Environment, Conservation and Parks
15. Sandy Bihn	Lake Erie Waterkeeper
16. Caren Binding	Environment and Climate Change Canada
17. Jennifer Boehme	International Joint Commission
18. Peter Brandt	
19. Todd Brennan	Alliance for the Great Lakes
20. Eric Brown	Erie County Planning Department
21. Timothy Bruno	Pennsylvania Department of Environmental Protection
22. David Burden	International Joint Commission
23. Mark Burrows	International Joint Commission
24. Earl Campbell	National Park Service
25. Luca Cargnelli	Environment and Climate Change Canada
26. Shampa Chakraborty	Environment and Climate Change Canada
27. Stacey Cherwaty	Environment and Climate Change Canada
28. Danielle Chesky	Embassy of Canada
29. Matthew Child	International Joint Commission
30. Gavin Christie	Fisheries and Oceans Canada
31. Eric Cleland	Nature Conservancy of Canada
32. Steve Clement	Environment and Climate Change Canada
33. James Clift	Michigan Department of Environment, Great Lakes, and Energy
34. Steven Corsi	U.S. Geological Survey
35. Jane Corwin	International Joint Commission
36. Timothy Cowdery	U.S. Geological Survey
37. Carrie Coy	Little Traverse Bay Band of Odawa Indians
38. Joshua Cummings	

39. Dorianne Cushman	Ontario Ministry of Agriculture, Food and Rural Affairs
40. Jennifer Day	National Oceanic and Atmospheric Administration
41. Frances Delaney	Environment and Climate Change Canada
42. Genevieve Donin	Stratos
43. Matthew Doss	Great Lakes St. Lawrence Cities Initiative
44. John Dungavell	Ontario Ministry of Natural Resources and Forestry
45. Lawrence Euteneier	
46. Susan Evans	Canadian Consulate General Chicago
47. Elizabeth Everhardus	Ontario Ministry of the Environment, Conservation and Parks
48. Crystal Faulk	Sault Tribe of Chippewa Indians
49. Jack Faulk	U.S. Environmental Protection Agency
50. Christopher Fidler	New York Department of Environmental Conservation
51. Gregory Ford	Niagara Coastal Community Collaborative
52. Bonnie Fox	Conservation Ontario
53. Rhonda Gagnon	Anishinabek Nation
54. Steve Galarneau	Wisconsin Department of Natural Resources
55. Raj Gill	Canadian Freshwater Alliance
56. Jayla Giorgi	Aamjiwnaang First Nation
57. Alexander Girard	
58. Michael Goffin	Environment and Climate Change Canada
59. Kate Golden	City of Lorain
60. Nancy Goucher	University of Waterloo
61. Lawrence Gunther	Blue Fish Canada
62. A.J. Gutz	Joined
63. Thom Hagerty	Ontario Ministry of Agriculture, Food and Rural Affairs
64. Wellsley Hamilton	Environment and Climate Change Canada
65. John Haugland	U.S. Environmental Protection Agency
66. Kristina Heinemann	U.S. Environmental Protection Agency
67. Gail Hesse	National Wildlife Federation
68. Elizabeth Hinchey	U.S. Environmental Protection Agency
69. Richard Hobrla	Michigan Department of Environment, Great Lakes, and Energy
70. Anders Holder	Environment and Climate Change Canada
71. Eamonn Horan-Lunney	Great Lakes St. Lawrence Cities Initiative
72. Jon Hortness	U.S. Geological Survey
73. Brian Houck	
74. Chris Hoyos	Chiefs of Ontario
75. Susan Humphrey	Environment and Climate Change Canada
76. Michael Isham	Great Lakes Indian Fish and Wildlife Commission
77. Kristen Isom	U.S. Environmental Protection Agency
78. John Jackson	Toxics Free Great Lakes Binational Network
79. Susanne Jakobsen	Ontario Ministry of the Environment, Conservation and Parks

80. Lisa Janairo	Great Lakes-St Lawrence Legislative Caucus
81. Mark Jemison	Township of Wainfleet
82. Erika Jensen	Great Lakes Commission
83. Jessica Jock	Saint Regis Mohawk Tribe
84. Bretton Joldersma	Michigan Department of Environment, Great Lakes, and Energy
85. Jenna Jorns	Great Lakes Integrated Sciences and Assessments
86. Daniel Joyce	Ontario Ministry of the Environment, Conservation and Parks
87. Jennifer Kanine	Pokagon Band of Potawatomi Indians
88. Shaffina Kassam	Environment and Climate Change Canada
89. Tiffani Kavalec	Ohio Environmental Protection Agency
90. Jennifer Keyes	Ontario Ministry of Natural Resources and Forestry
91. Rupert Kindersley	Georgian Bay Association
92. Roger Knight	Great Lakes Fishery Commission
93. Carolyn Koch	Michigan Department of Health and Human Services
94. Christopher Korleski	U.S. Environmental Protection Agency
95. Ben Koski	
96. Gail Krantzberg	McMaster University
97. Robert Krska	U.S. Fish and Wildlife Service
98. Susanne Kuester	
99. Ash Kumar	Environment and Climate Change Canada
100. Alesia Kurlek	Environment and Climate Change Canada
101. Hala Kuss	Indiana Department of Environmental Management
102. Pamela Lamba	Ontario Ministry of the Environment, Conservation and Parks
103. Bob Lambe	Great Lakes Fishery Commission
104. Elizabeth LaPlante	U.S. Environmental Protection Agency
105. Javier Laureano	U.S. Environmental Protection Agency
106. Nathalie Lavoie	Global Affairs Canada
107. Deborah Lee	National Oceanic and Atmospheric Administration
108. James Lehnen	New York State Department of Environmental Conservation
109. Fe de Leon	Canadian Environmental Law Association
110. Henry Lickers	International Joint Commission
111. Anastasia Lintner	Canadian Environmental Law Association
112. Sr. Pat Lupo	Benedictine Sisters of Erie PA
113. Caryn MacLoughlin	Métis Nation of Ontario
114. Camille Mageau	International Joint Commission
115. Ling Mark	Ontario Ministry of the Environment, Conservation and Parks
116. Stephen Marklevitz	Ontario Ministry of Natural Resources and Forestry
117. John Marsden	
118. Anton Martig	U.S. Environmental Protection Agency
119. Catherine Masson	
120. Greg Mayne	Environment and Climate Change Canada

121.	Andrew McCammon	
122.	Greg McClinchey	Great Lakes Fishery Commission
123.	Jim McKane	Great Lakes Fishery Commission
124.	Jody McKenna	Environment and Climate Change Canada
125.	Andy Metelka	Georgian Bay Association
126.	Kristy Meyer	Freshwater Future
127.	Felicia Minotti	Global Affairs Canada
128.	Tricia Mitchell	Environment and Climate Change Canada
129.	Caroline Moellering	Little Traverse Bay Band of Odawa Indians
130.	Mohamed Mohamed	Environment and Climate Change Canada
131.	Scott Morlock	
132.	Anna-Marie Muise	Environment and Climate Change Canada
133.	Joy Mulinex	Ohio Lake Erie Commission
134.	Sonny Myers	1854 Treaty Authority
135.	David Nanang	Fisheries and Oceans Canada
136.	Steve Naylor	Fisheries and Oceans Canada
137.	Shane Nelson	
138.	Todd Nettesheim	U.S. Environmental Protection Agency
139.	Lori Nordstrom	U.S. Fish and Wildlife Service
140.	Linda Nguyen	Red Cliff Band of Lake Superior Chippewa
141.	Martha Nielsen	U.S. Geological Survey
142.	Brayden Nilsen	Environment and Climate Change Canada
143.	Hilary Oakman	Fisheries and Oceans Canada
144.	Thomas O'Donnell	
145.	Carolyn O'Neill	Ontario Ministry of the Environment, Conservation and Parks
146.	Paul Parete	Environment and Climate Change Canada
147.	Scott Parker	Parks Canada
148.	Kimberly Passick	Michigan Department of Environment, Great Lakes, and Energy
149.	Matthew Pawlowski	
150.	Heather Pearson	Ontario Ministry of the Environment, Conservation and Parks
151.	Autumn Peltier	
152.	Robert Phillips	International Joint Commission
153.	Bruno Pigott	Indiana Department of Environmental Management
154.	Carl Platz	U.S. Army Corps of Engineers
155.	Matt Preisser	Michigan Department of Environment, Great Lakes, and Energy
156.	Howard Reeves	U.S. Geological Survey
157.	Cameron Richardson	Town of Ajax
158.	Violeta Richardson	Environment and Climate Change Canada
159.	Bev Ross	Fisheries and Oceans Canada
160.	Stephanie Rowley	Environment and Climate Change Canada
161.	Steve Ruberg	National Oceanic and Atmospheric Administration

162.	Michael Russ	
163.	Mitra Saidi	Public Services and Procurement Canada
164.	Faith Sayavong	Ontario Ministry of the Environment, Conservation and Parks
165.	James Schardt	U.S. Environmental Protection Agency
166.	Rebecca Schroeder	Invasive Species Centre
167.	Anne Scofield	U.S. Environmental Protection Agency
168.	James Scott	Ontario Ministry of the Environment, Conservation and Parks
169.	Lisa Sealock	Environment and Climate Change Canada
170.	Shannon Seko	Transport Canada
171.	Victor Serveiss	International Joint Commission
172.	Emily Sheridan	New York State Department of Environmental Conservation
173.	Jocelyn Sherwood	Environment and Climate Change Canada
174.	Ryan Siggelkow	Forest County Potawatomi Community
175.	Julie Simard	Ontario Ministry of Natural Resources and Forestry
176.	Robert Sisson	International Joint Commission
177.	Kushal Som	
178.	Michael Spinar	Indiana Department of Environmental Management
179.	Nancy Stadler-Salt	Environment and Climate Change Canada
180.	Gary Stemerdink	Niagara Coastal Community Collaborative Inc
181.	Stephanie Swart	Michigan Department of Environment, Great Lakes, and Energy
182.	Barb Sweazey	Stratos
183.	David Sweetnam	Georgian Bay Forever
184.	Tom Swinford	Indiana Department of Natural Resources
185.	Bonnie Syme	Ontario Ministry Natural Resources and Forestry
186.	Kate Taillon	Environment and Climate Change Canada
187.	Kurt Thiede	U.S. Environmental Protection Agency
188.	Mary Thiess	Parks Canada
189.	Lorne Thomas	U.S. Coast Guard
190.	Carla Torchia	Environment and Climate Change Canada
191.	Marc Tuchman	U.S. Environmental Protection Agency
192.	Jennifer Vanator	Great Lakes Indian Fish and Wildlife Commission
193.	Allison Voglesong-Zejnati	International Joint Commission
194.	Natalija Vojno	
195.	Nicholas Vrevich	USDA Forest Service
196.	Lizhu Wang	International Joint Commission
197.	Melanie Ward	Ontario Ministry of the Environment, Conservation and Parks
198.	Laureen Blu Waters	
199.	Mike Weimer	U.S. Fish and Wildlife Service
200.	Adam Weir	Ontario Federation of Anglers and Hunters
201.	Chip Wendt	
202.	Erin Williams	National Park Service

203.	John Wilson	International Joint Commission
204.	Jill Wingfield	Great Lakes Fishery Commission
205.	Aaron Woldt	U.S. Fish and Wildlife Service
206.	Charles Wooley	U.S. Fish and Wildlife Service
207.	Santina Wortman	U.S. Environmental Protection Agency
208.	Andrea Vander Woude	National Oceanic and Atmospheric Administration
209.	Ram Yerubandi	Environment and Climate Change Canada
210.	Lance Yohe	International Joint Commission
211.	Melissa De Young	Pollution Probe
212.	Nicole Zacharda	Great Lakes Commission
213.	Donald Zelazny	New York Department of Environmental Conservation